SANDIA NATIONAL LABORATORIES
WASTE ISOLATION PILOT PLANT

SUMMARY REPORT ON THE MIGRATION OF THE WIPP PA CODES FROM SOLARIS TO LINUX

AP-184

REVISION 0

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Executive Summary

Due to diminishing hardware and software support, the Waste Isolation Pilot Plant (WIPP) performance assessment (PA) system is being moved from the Oracle Solaris cluster to the HPC/Linux cluster under the analysis plan AP-184 (Long, 2020b). This report documents the file and computational code migration from the Solaris cluster to the Linux cluster. All files archived on the Solaris were transferred to the Linux cluster, and the verification of the file transfer is documented in this report. The PA codes were ported, built, and qualified for use on the Linux cluster. In addition to the individual code validations done in the validation documents as part of qualification, an integration test of running the CRA-2019 PA calculation on the Linux cluster was done. The comparison of the CRA-2019 PA results on Solaris to the results on Linux shows nearly identical means and few differences at the vector level. Based on the results included herein, the Linux system is operational and can reproduce, to an acceptable level, previous compliance recertification PA calculations. The Linux system is fully capable of running future PA calculations.

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Acronyms

CDB	CAMDAT Database
CCDF	Complementary cumulative distribution function
CFR	Code of Federal Regulations
CRA19	Compliance Recertification Application 2019
CVS	Concurrent Versioning System
DD	Design document
DOE	Department of Energy
EPA	Environmental Protection Agency
EPA Units	Curies of releases normalized to the repository inventory
I&C	Installation and Checkout form
ID	Implementation document
PA	Performance assessment
RD	Requirement's document
SNL	Sandia National Laboratories
SPR	Software problem report
UM	User's manual
VD	Validation document
VVP	Verification and validation plan
WIPP	Waste Isolation Pilot Plant

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1.0 INTRODUCTION

The Waste Isolation Pilot Plant (WIPP), located in southeastern New Mexico, has been developed by the U.S. Department of Energy (DOE) for the geologic (deep underground) disposal of transuranic (TRU) waste. Containment of TRU waste at the WIPP is regulated by the U.S. Environmental Protection Agency (EPA) according to the regulations set forth in Title 40 of the Code of Federal Regulations (CFR), Part 191.

The DOE demonstrates compliance with the containment requirements according to the Certification Criteria in Title 40 CFR Part 194 by means of performance assessment (PA) calculations performed by Sandia National Laboratories (SNL). WIPP PA calculations estimate the probability and consequence of potential radionuclide releases from the repository to the accessible environment for a regulatory period of 10,000 years after facility closure. WIPP PA models are used to support the repository recertification process that occurs at five-year intervals following the receipt of the first waste shipment at the site in 1999.

The models used in PA are maintained and updated with new information as part of an ongoing process. Improved information regarding important WIPP features, events, and processes (FEPs) typically results in refinements and modifications to PA models and the parameters used in them. Planned changes to the repository and/or the components therein also result in updates to WIPP PA models.

This report summarizes the migration of the WIPP PA files and computation codes from the Oracle Solaris cluster to the HPC/Linux cluster. The motivation for the migration is diminishing hardware and software support for Solaris. The Linux cluster is a Dell PowerEdge C6420 running CentOS 7.

The primary objective of this effort was to port and qualify those codes needed to perform PA on the HPC/Linux cluster. The port of the LHS code to Linux also included modifications to replicate the random number sampling obtained on the Solaris for vector by vector comparisons of PA results.

1.1 Procedures

The port of the codes followed the procedures defined in NP 19-1 (Long, 2017, Long, 2020a)[1] and AP-184 (Long, 2020b). There were 6 tasks for the migration of PA codes to the new Linux platform defined in AP-184.

Task 1: Transfer all files from Solaris to Linux. Verify that the number of files located on the Solaris cluster is identical to the number of files transferred to the Linux cluster. Verify that the log files do not contain any errors. The system administrator will perform this task. The product of this task will be documented in the analysis report.

Task 2: Produce all appropriate software life-cycle documentation, starting with the Change Control Form (NP 19-1-9) and ending with the Installation and Checkout Form (NP 19-1-8), for

[1] The NP19-1 Software Requirements procedure was revised while this work was being performed. The changes were minor and did not have any impact on the work.

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each code in Table 1 of Long (2020b) per NP 19-1 (Long, 2017, Long, 2020a)[2]. The code sponsor for each code will perform this task. The product of this task will be the appropriate software life-cycle documentation for each code.

Task 3: Build new version of each code listed in Table 1 of Long (2020a) on the Linux cluster. The Run Control Coordinator will perform this task. The product of this task will be documented in the analysis report.

Task 4: Test new version of each code listed in Table 1 on the Linux cluster per NP 19-1 (Long, 2017, Long, 2020a)[2]. This task will be performed by the Run Control Coordinator. The product of this task will be the results included in the Validation Documents produced by the code sponsors.

Task 5: The CRA-2019 PA (referred to as CRA19) will be re-run on Linux and the mean CCDFs compared to those from the Solaris run to ensure the CCDFs are reasonable based on expert technical judgement. This task will be performed by the Run Control Coordinator. The product of this task will be documented in the analysis report.

Task 6: Produce an analysis report to document the completion of these tasks.

1.2 CVS

The builds, source codes, and files related to validation testing, including the scripts, for each code were stored in a CVS repository named for that code. The convention used was to name the repository in upper case, e.g., BRAGFLO, and the executable file in lower case. The repositories were stored in a file system that is shared with the various Solaris and Linux computers used for PA calculations. The path to the directory containing the CVS repositories on Linux is /data/cvs/CVSLIB/WIPP_CODES/PA_CODES. All code repositories have the same structure. The executable file is stored in the module (upper-level directory) called Build under the subdirectory Linux. The scripts associated with compiling the code are in RunControl/Linux. The source codes are in the module Source. The Test module has the directories Auxiliary, Input, Output and RunControl to store auxiliary files, input files, output files, and the scripts, respectively, for the validation tests.

1.3 Deviations from Analysis Plan

Section 2.5 of AP-184 describes the change to LHS that will create a new random sampling and a task to re-run the CRA19 calculation with a new random number sample. It was determined that the same random number sample read in from a file by LHS could continue to be used in future PA calculations, so a new random sample was not needed at this time. Therefore, an analysis with a new random sample was not ran.

The groundwater flow simulation code MWT3D was planned for migration to the Linux cluster. It was decided to not port the code due to the level of effort needed to properly build the code to

[2] The NP19-1 Software Requirements procedure was revised while this work was being performed. The changes were minor and did not have any impact on the work.

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the Linux cluster. When the basin-scale groundwater flow simulations is to be updated, a new simulation code will be qualified and used.

Table 1 of AP-184 (Long, 2020b) notes that version 7.03 was the current version of CCDFGF however an updated version 7.04 was anticipated to be migrated to Linux. Version 7.03 of CCDFGF was the version used for the CRA19 calculation (Zeitler, 2019) and was ported to Linux as version 7.06. CCDFGF version 7.04 was created on Solaris and used in the NEPA20 analysis (Zeitler, 2020). CCDFGF version 7.05 was created on Solaris and used in the APPA analysis (Hansen, 2020). CCDFGF version 8.00 was created on Solaris and used in the RPPA analysis (Hansen, 2021). It is expected that CCDFGF modification made to version 8.00 will eventually be ported to Linux, it is not expected that versions 7.04 or 7.05 will be ported to Linux.

Similarly, PRECCDFGF version 2.01 was used on Solaris for CRA19 and migrated to Linux for version 2.03. PRECCDFGF version 2.02 was created on Solaris and used for the APPA analysis. PRECCDFGF version 3.00 was created on Solaris for the RPPA analysis, and the modification made for version 3.00 are expected to eventually be ported to Linux. It is not expected that version 2.02 will be ported to Linux.

1.4 Software Problem Reports

There was one SPR created and resolved during the migration. SPR #21-002 (Bethune, 2021) involved the PRESECOTP2D code, and the assignment of automatic boundary conditions to all SECOTP2D domain boundary cell edges that are not defined by the *BOUND keyword. However, SECOTP2D automatic boundaries are not allowable for WIPP compliance calculations (Loukota, 1997), and the *BOUND keyword is not validated in the PRESECOTP2D functional tests. The PRESECOTP2D version 1.24 default boundary condition was changed to a Dirichlet type boundary with a value of 0.0 for all cell edges not defined by the *BOUND keyword. The *BOUND keyword was validated in the PRESECOTP2D version 1.24 qualification.

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2.0 FILE TRANSFER AND VERIFICATION

All files from Solaris were transferred to Linux using the rsync utility. The rsync utility is a fast and versatile command-line utility for synchronizing files and directories between two locations over a remote shell. The script for the rsync (cvs_rsync_fwm.sh) is stored in /data/cvs/CVSLIB/WIPP_EXTERNAL/ap184/Files. The number of files located on the Solaris cluster was verified to ensure the identical number of files was transferred to the Linux cluster. This was also done using a command-line commands to count files. There were 876,149 files in both CVS repositories. Also using command-line commands, the CVS repository sizes were compared. Both CVS repositories were 1.5 terabytes. The command-line commands used for these verifications were saved to a text file (command_line_commands.txt) and stored in /data/cvs/CVSLIB/WIPP_EXTERNAL/ap184/Files. A log file was produced and checked to ensure it did not contain any errors. The log file (060925.02262020-cvs_rsync.log) for the transfer is stored in /data/cvs/CVSLIB/WIPP_EXTERNAL/ap184/Files. The file transfer and verification were performed by the system administrator.

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3.0 CODE QUALIFICATION

Changes to the codes during the port included new functionality for LHS, enabling the reading and writing of random number samples and the changes to PRESECOTP2D to resolve the Software Problem Report (SPR). All of the life cycle documents were updated for the codes ported to Linux. Table 1 lists code documents created for Linux versions of migrated codes.

Table 1: Life cycle documents created during Linux Migration. Document Version Number shown with the ERMS numbers.

Code Name and Version	Executable Date	Document						
		SQAP	RD	VVP	DD	ID	UM	VD
ALGEBRACDB 2.37	8/17/2020	2.37 (573762)	2.37 (573763)	2.37 (573763)	2.37 (573764)	2.37 (573765)	2.37 (573764)	2.37 (573763)
BLOTCDB 1.39	1/26/2021	1.39 (575416)	1.39 (575417)	1.39 (575417)	1.39 (575418)	1.39 (575419)	1.39 (575418)	1.39 (575417)
BRAGFLO 7.01	9/17/2020	7.01 (573919)	7.01 (573900)	7.01 (573900)	7.01 (573901)	7.01 (573902)	7.01 (573901)	7.01 (573900)
CCDFGF 7.06	11/13/2020	7.06 (574337)	7.06 (574338)	7.06 (574338)	7.06 (574339)	7.06 (574340)	7.06 (574339)	7.06 (574338)
CCDFVECTOR STATS 1.02	8/19/2020	1.02 (573768)	1.02 (573769)	1.02 (573769)	1.02 (573770)	1.02 (573771)	1.02 (573770)	1.02 (573769)
CUTTINGS_S 6.04	11/13/2020	6.04 (574594)	6.04 (574595)	6.04 (574595)	6.04 (574596)	6.04 (574597)	6.04 (574596)	6.04 (574595)
DRSPALL 1.24	9/17/2020	1.24 (573920)	1.24 (573905)	1.24 (573905)	1.24 (573906)	1.24 (573907)	1.24 (573906)	1.24 (573905)
DTRKMF 1.02	1/13/2021	1.02 (574325)	1.02 (574326)	1.02 (574326)	1.02 (574327)	1.02 (574328)	1.02 (574327)	1.02 (574326)
EPAUNI 1.20	8/19/2020	1.20 (573786)	1.20 (573787)	1.20 (573787)	1.20 (573788)	1.20 (573789)	1.20 (573788)	1.20 (573787)
GENMESH 6.11	8/20/2020	6.11 (573792)	6.11 (573793)	6.11 (573793)	6.11 (573794)	6.11 (573795)	6.11 (573794)	6.11 (573793)
GROPECDB 2.14	6/16/2020	2.14 (573798)	2.14 (573799)	2.14 (573799)	2.14 (573800)	2.14 (573801)	2.14 (573800)	2.14 (573799)
ICSET 2.24	8/20/2020	2.24 (573804)	2.24 (573805)	2.24 (573805)	2.24 (573806)	2.24 (573807)	2.24 (573806)	2.24 (573805)

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Code Name and Version	Executable Date	Document						
		SQAP	RD	VVP	DD	ID	UM	VD
LHS 3.00	11/1/2021	3.00 (574192)	3.00 (574193)	3.00 (574193)	3.00 (574194)	3.00 (574195)	3.00 (574194)	3.00 (574193)
MATSET 9.25	9/8/2020	9.25 (573810)	9.25 (573811)	9.25 (573811)	9.25 (573812)	9.25 (573813)	9.25 (573812)	9.25 (573811)
MERGESPALL 1.03	8/19/2020	1.03 (573816)	1.03 (573817)	1.03 (573817)	1.03 (573818)	1.03 (573819)	1.03 (573818)	1.03 (573817)
MODFLOW2000 1.08	11/13/2020	1.08 (574331)	1.08 (574332)	1.08 (574332)	1.0 (523869) & (525357)	1.08 (574334)	1.0 (523869) & (525357)	1.08 (574332)
NONLIN 2.03	9/17/2020	2.03 (573921)	2.03 (573910)	2.03 (573910)	2.03 (573911)	2.03 (573912)	2.03 (573911)	2.03 (573910)
NUTS 2.08	11/16/2021	2.08 (573822)	2.08 (573823)	2.08 (573823)	2.08 (573824)	2.08 (573825)	2.08 (573824)	2.08 (573823)
PANEL 5.01	8/20/2020	5.01 (573828)	5.01 (573829)	5.01 (573829)	5.01 (573830)	5.01 (573831)	5.01 (573830)	5.01 (573829)
PEST 9.13	5/18/2021	9.13 (575240)	9.13 (575241)	9.13 (575241)	9.13 (575242)	9.13 (575243)	9.13 (575242)	9.13 (575241)
POSTBRAG 4.03	9/8/2020	4.03 (573834)	4.03 (573835)	4.03 (573835)	4.03 (573836)	4.03 (573837)	4.03 (573836)	4.03 (573835)
POSTLHS 4.12	9/17/2020	4.12 (573922)	4.12 (573915)	4.12 (573915)	4.12 (573916)	4.12 (573917)	4.12 (573916)	4.12 (573915)
POSTSECOTP2D 1.06	8/17/2020	1.06 (573540)	1.06 (573841)	1.06 (573841)	1.06 (573842)	1.06 (573843)	1.06 (573842)	1.06 (573841)
PREBRAG 9.01	8/20/2020	9.01 (573546)	9.01 (573847)	9.01 (573847)	9.01 (573848)	9.01 (573849)	9.01 (573848)	9.01 (573847)
PRECCDFGF 2.03	11/13/2020	2.03 (574343)	2.03 (574344)	2.03 (574344)	2.03 (574345)	2.03 (574346)	2.03 (574345)	2.03 (574344)
PRELHS 2.45	8/19/2020	2.45 (573852)	2.45 (573853)	2.45 (573853)	2.45 (573854)	2.45 (573855)	2.45 (573854)	2.45 (573853)
PRESECOTP2D 1.24	1/5/2022	1.24 (573859)	1.24 (573860)	1.24 (573860)	1.24 (573861)	1.24 (573862)	1.24 (573861)	1.24 (573860)

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Code Name and Version	Executable Date	Document						
		SQAP	RD	VVP	DD	ID	UM	VD
RELATE 1.46	8/20/2020	1.46 (573865)	1.46 (573866)	1.46 (573866)	1.46 (573867)	1.46 (573868)	1.46 (573867)	1.46 (573866)
SCREEN_NUTS 1.03	8/19/2020	1.03 (573871)	1.03 (573872)	1.03 (573872)	1.03 (573873)	1.03 (573874)	1.03 (573873)	1.03 (573872)
SECOTP2D 1.44	8/20/2020	1.44 (573877)	1.44 (573878)	1.44 (573878)	1.44 (573879)	1.44 (573880)	1.44 (573879)	1.44 (573878)
STEPWISE 2.23	10/28/2020	2.23 (575295)	2.23 (575296)	2.23 (575296)	2.23 (575297)	2.23 (575298)	2.23 (575297)	2.23 (575296)
SUMMARIZE 3.03	8/17/2020	3.03 (573883)	3.03 (573884)	3.03 (573884)	3.03 (573885)	3.03 (573886)	3.03 (573885)	3.03 (573884)

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4.0 INTEGRATION TEST

Although the validation tests confirm that the performances of the individual codes are adequate, a comparison of results from a PA run on the Solaris and Linux is done to build confidence in the entire PA system. For this analysis the PA for the CRA19 was reran on the new HPC/Linux cluster and the releases projected by CCDFGF from the Solaris and Linux runs are compared.

There are two changes to how the PA calculation was ran on Linux from the run on Solaris. First, the random number generator within LHS has changed (WIPP PA, 2021) and in order to obtain the same random number realizations as the Solaris run for vector-by-vector comparison, the new functionality of LHS was used where an input file of random numbers was read in to LHS. These random number files were generated from the random number sampling on Solaris. There were changes to the python run control scripts that control the LHS execution to accommodate feeding these new random number files into LHS.

The second change to the PA calculation on Linux was running the DRSPALL and SECOTP2D codes. In the CRA19 calculation on Solaris no inputs for the calculations had changed for DRSPALL and SECOTP2D. These codes were not ran but the results from the Solaris migration of PABC09 (Kirchner et al., 2014; Kirchner et al., 2015) were instead used. For the Linux calculation of CRA19, DRSPALL and SECOTP2D were run with the same inputs from PABC09.

To easily accommodate updated entries in the AnalysisToVersion table that included DRSPALL and SECOTP2D parameters and the logging of parameter retrievals; the CRA19 PA calculation on Linux was given a new analysis name: CRA19_LX0 (King, 2022).

Not all of the codes ported to Linux were ran during the integration tests. For example, NONLIN, MODFLOW2000, PEST, DTRKMF, and STEPWISE are not directly part of the calculation of CCDFs used for comparison and were not ran for the integration tests.

4.1 Comparison of CRA19 Results

Mean releases by release component are plotted in Figure 1 through Figure 3. Solaris results are displayed using solid lines and Linux results using larger dotted lines. In all replicates, the mean of all release mechanisms shows no visible difference between the Solaris calculation and the Linux calculation.

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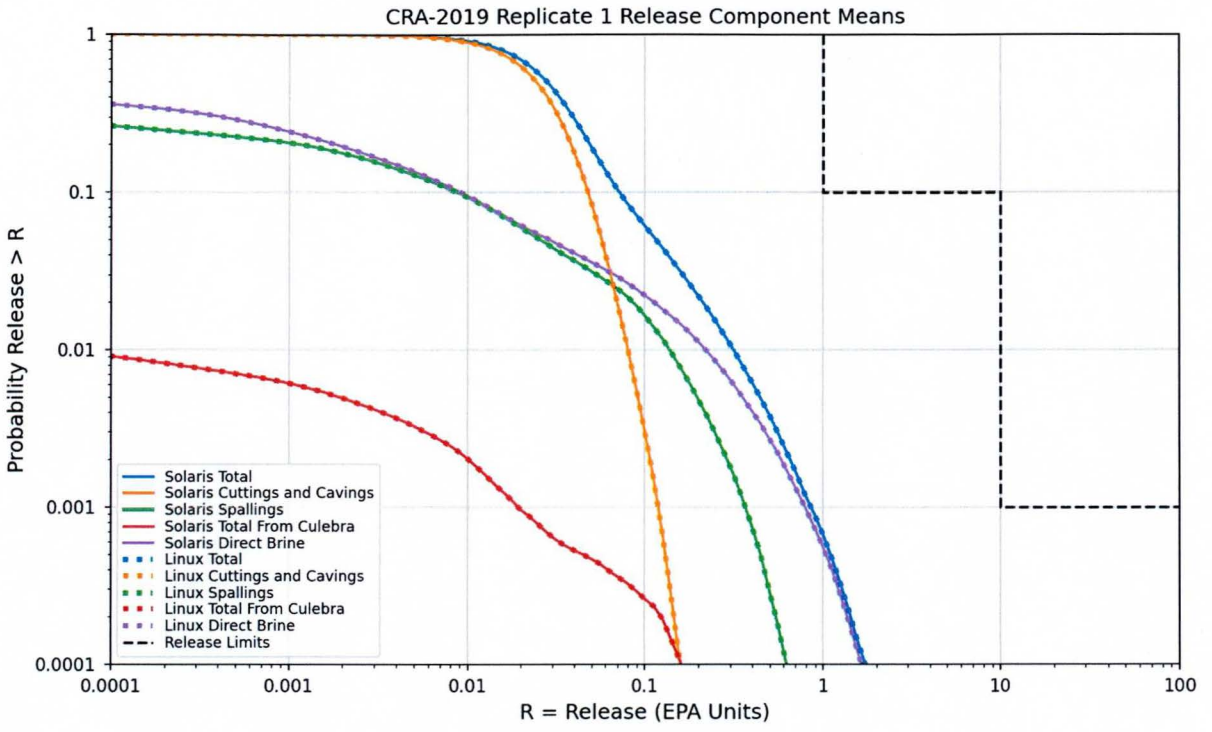


Figure 1. Comparison of mean releases for replicate 1.

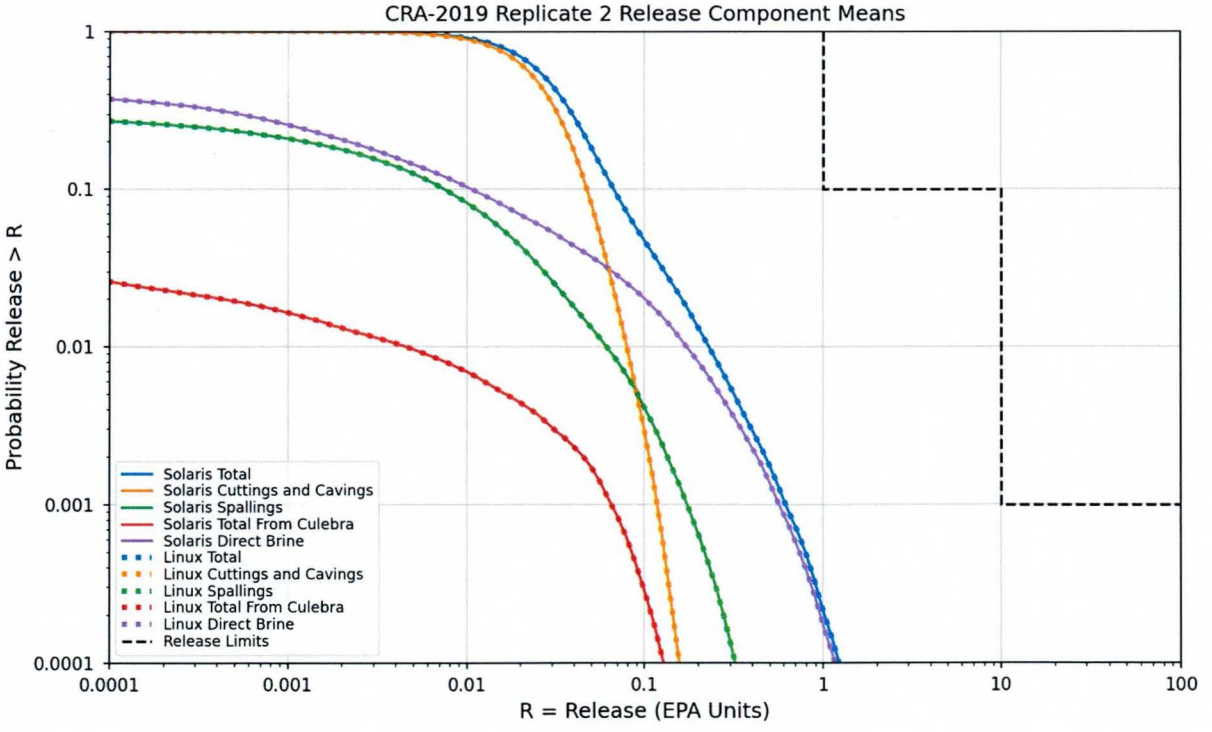


Figure 2. Comparison of mean releases for replicate 2.

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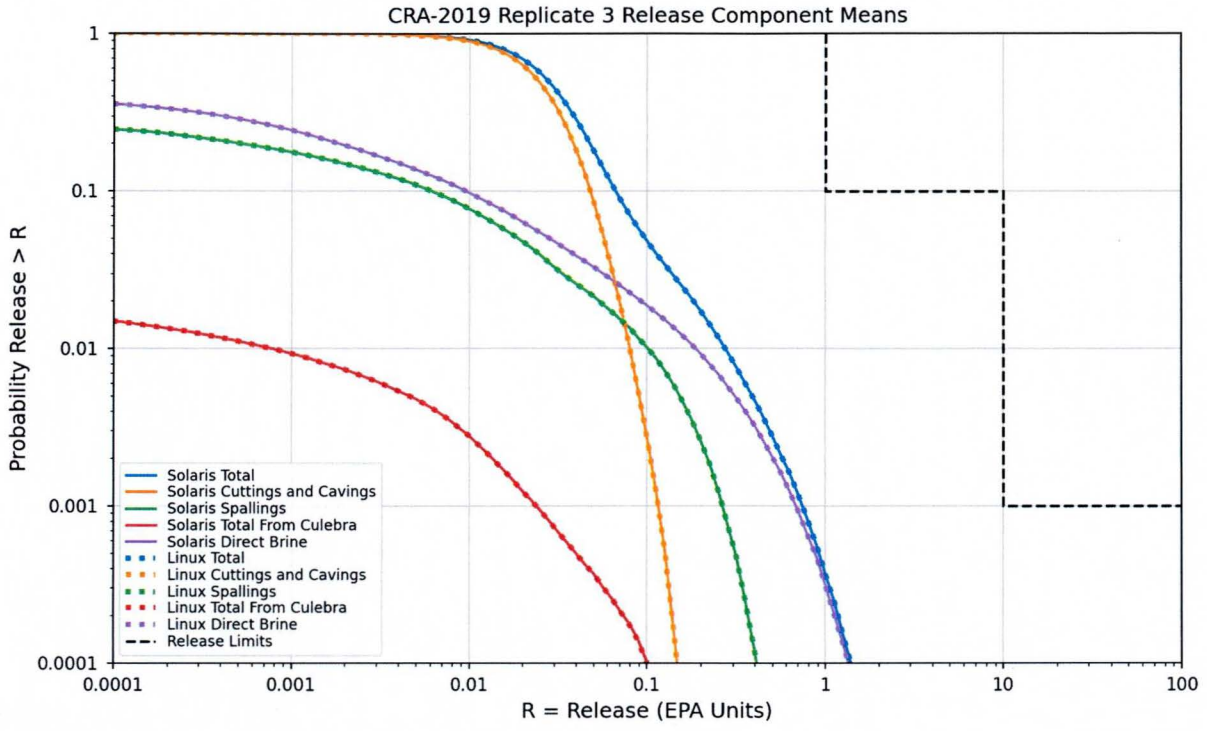


Figure 3. Comparison of mean releases for replicate 3.

To facilitate the comparison of the Linux results and the Solaris results for the CRA19 analysis, the vector data were paired by release values and the calculated probabilities compared. To eliminate results that are not impactful to the overall PA results but prone to numerical noise, release values less than 0.0001 EPA Units and probabilities of 0.0001 or less were excluded from this comparison. Paired release level probabilities on the diagonal 1 to 1 line represents a perfect match between the two calculations. Figure 4 shows Cuttings and Cavings releases by vector and plots comparing probabilities at paired release values for each replicate. Similar plots are shown for Direct Brine, Spallings, From Culebra, and Total releases in Figure 5 through Figure 8. While the paired release probabilities may appear exactly on the 1 to 1 diagonal line in Figure 4 through Figure 8, there is small deviations that can been seen when zoomed into a finer detail as shown in Figure 9.

Overall, the CCDF curves by vector for all release mechanisms from the Linux calculation and the Solaris calculations are nearly identical. Paired release probabilities are tightly distributed around the diagonal 1 to 1 line.

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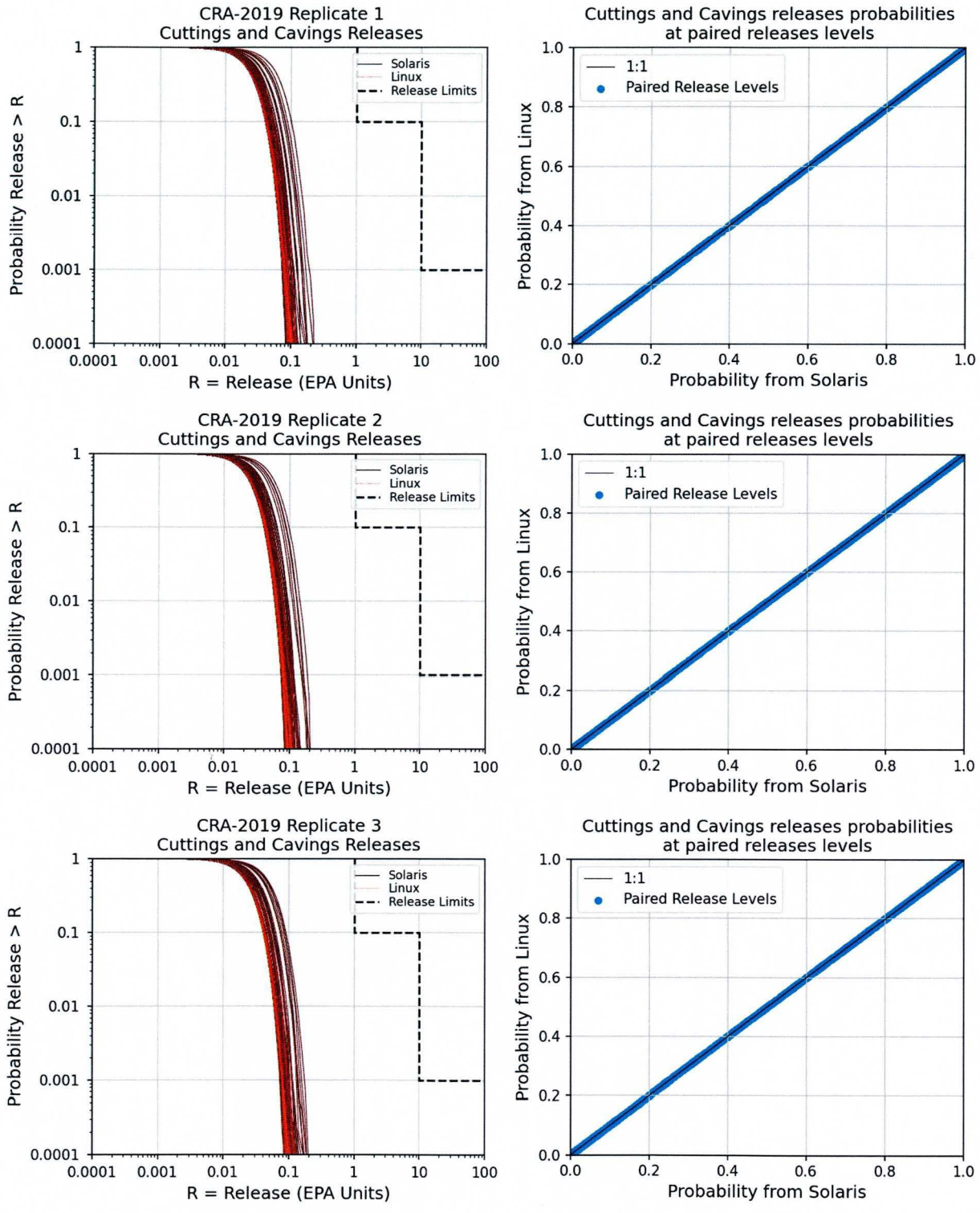


Figure 4. Cuttings and Cavings releases and probabilities at paired release levels.

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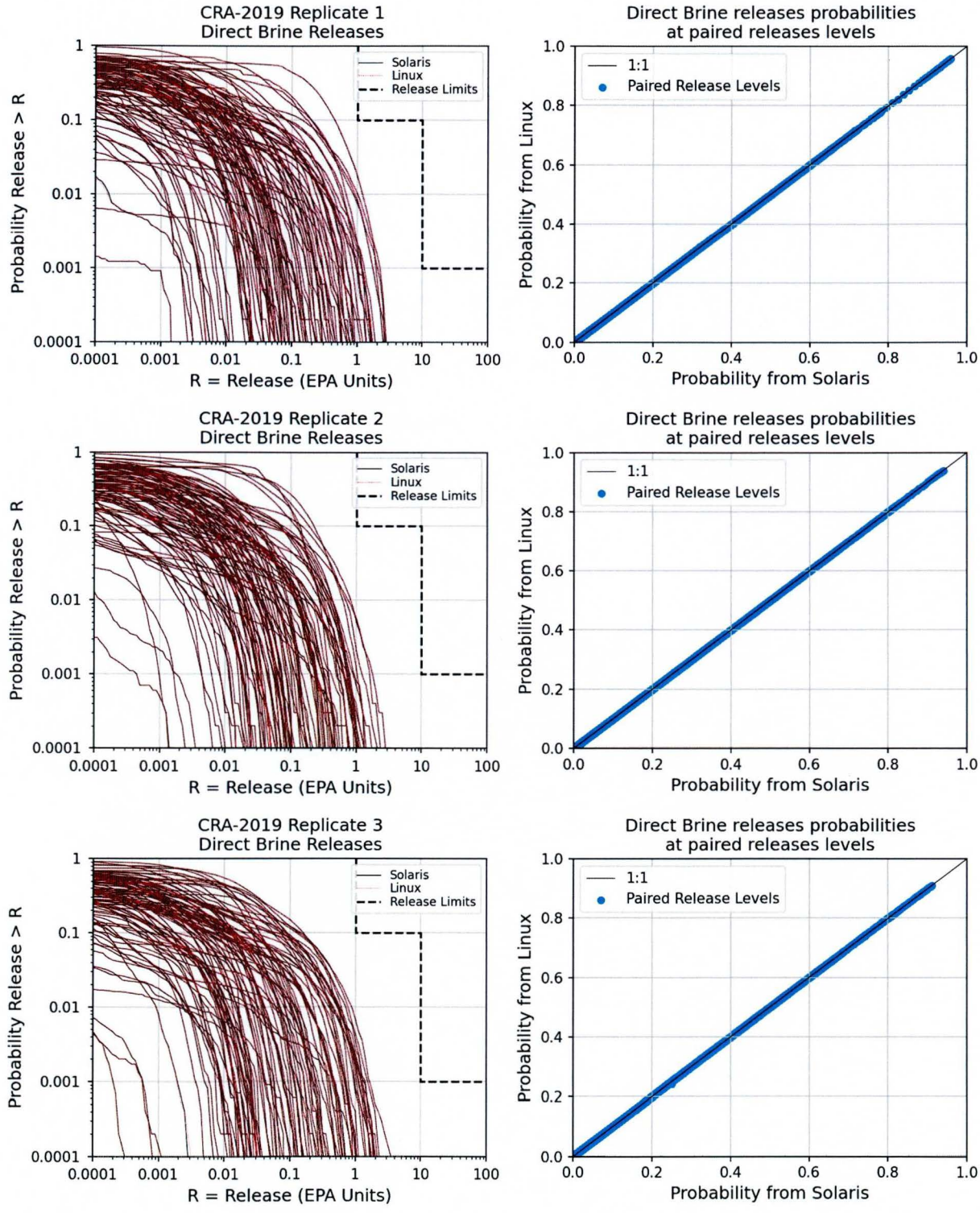


Figure 5. Direct brine releases and probabilities at paired release levels.

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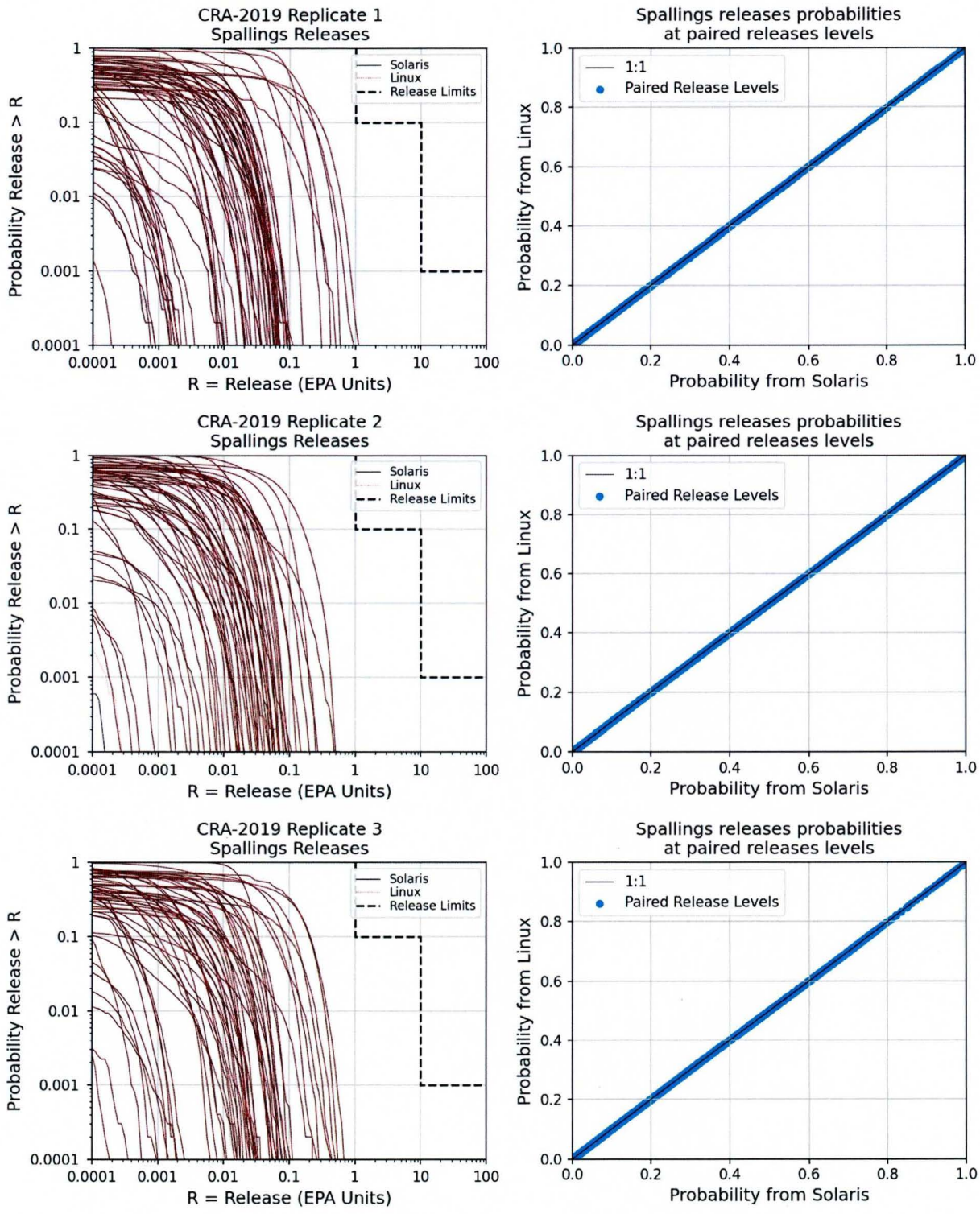


Figure 6. Spallings releases and probabilities at paired release levels.

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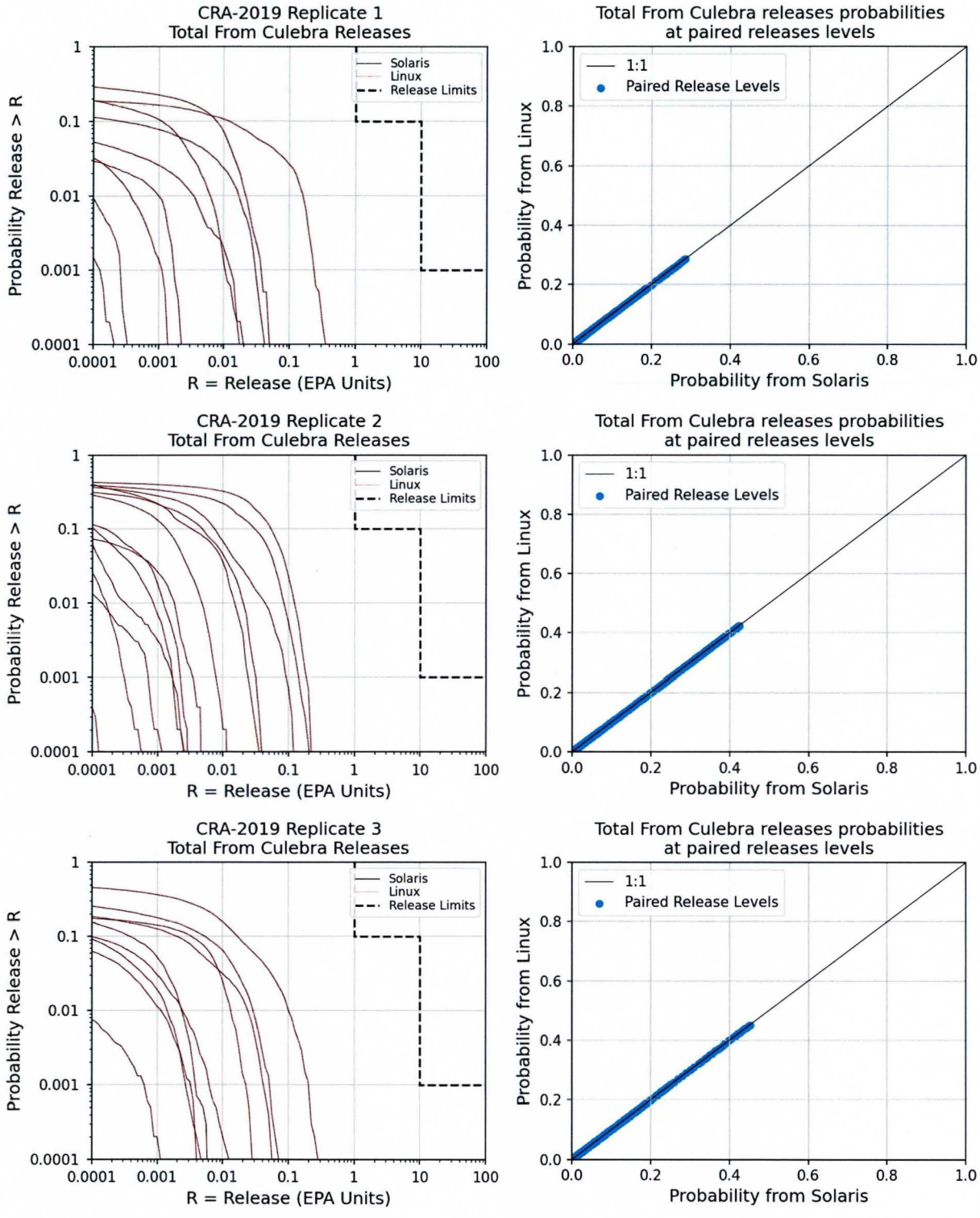


Figure 7. From Culebra releases and probabilities at paired release levels.

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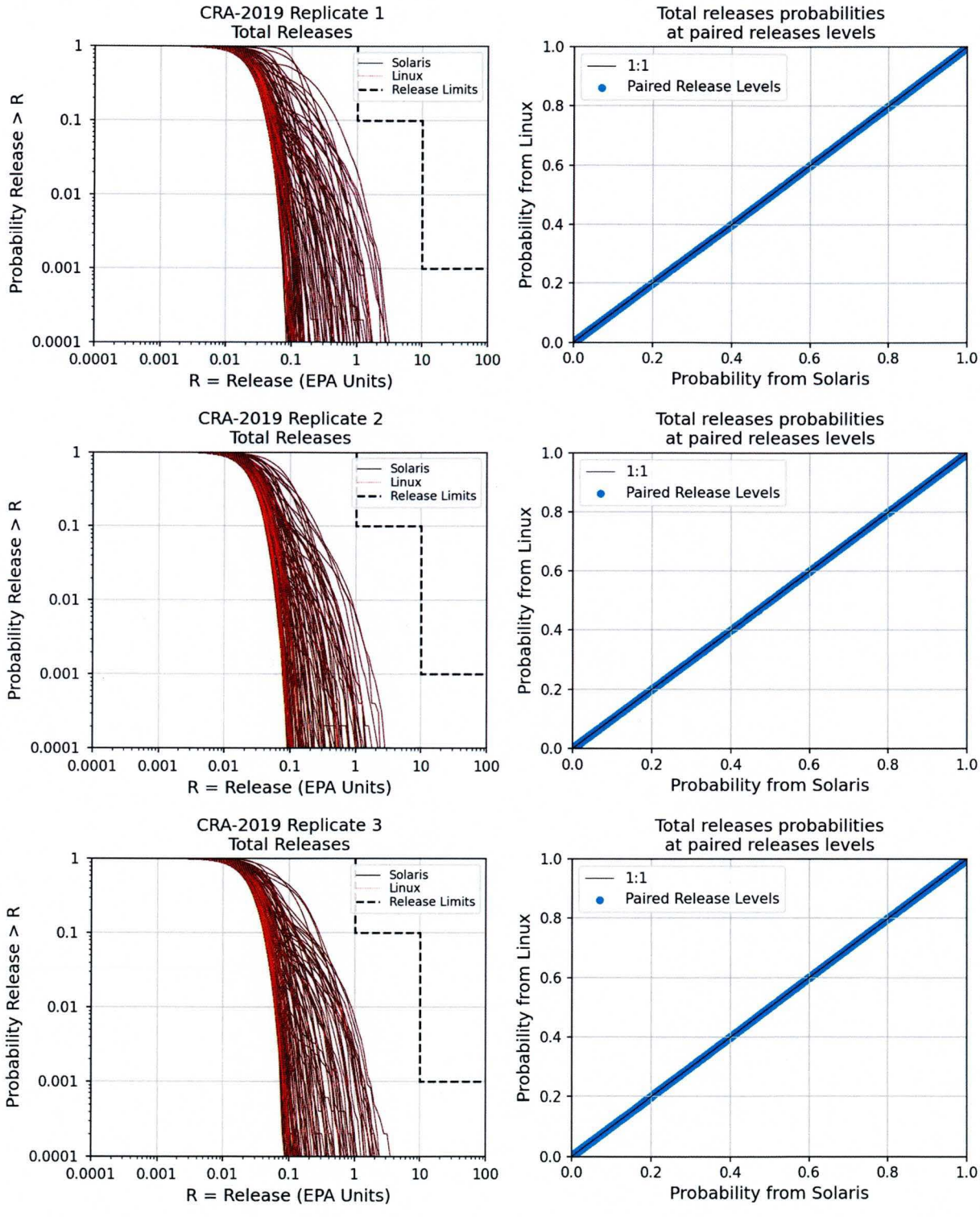


Figure 8. Total releases and probabilities at paired release levels.

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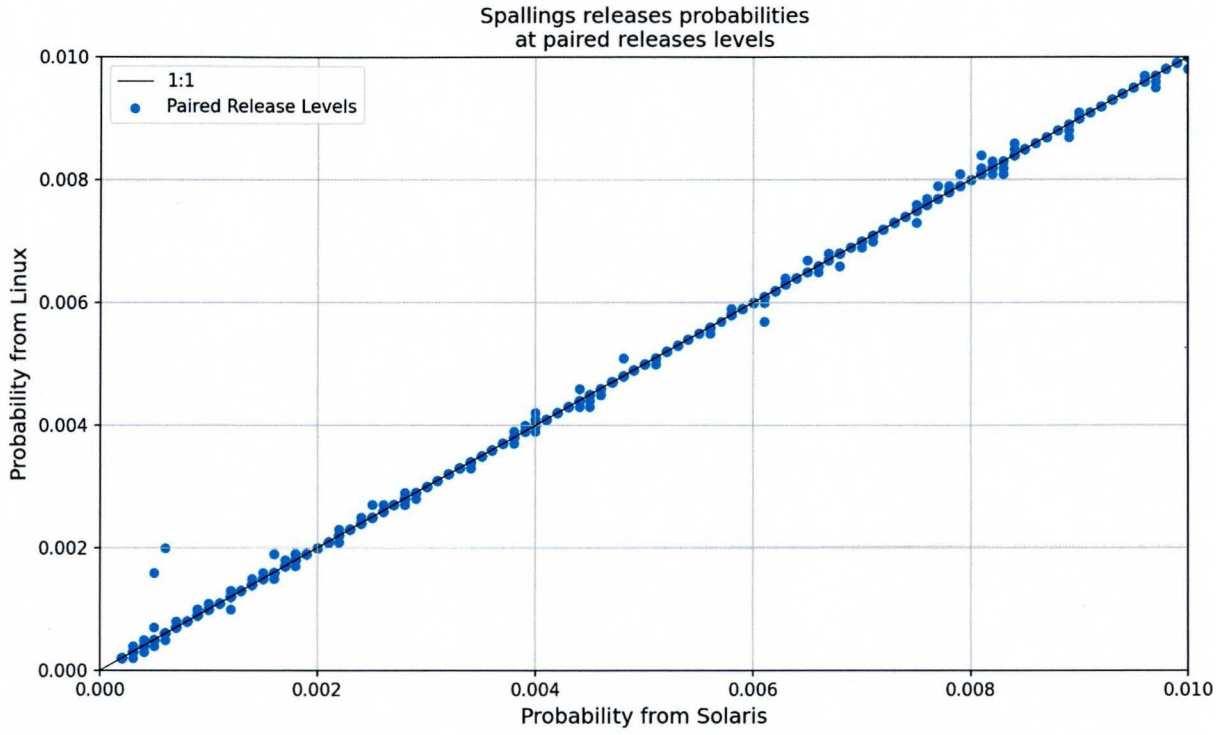


Figure 9. Paired Spallings release probabilities zoomed to 1% probability level.

4.2 Run Control

The execution of the CRA19 analyses on Linux (named CRA19_LX0) was performed under run control by the run master. Pertinent input and output files were stored in the CVS repository. Tables detailing the location of files are found in Appendix A.

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5.0 CONCLUSIONS

All files archived on the Solaris were transferred to the Linux cluster and the verification of the file transfer has been completed. The PA codes were ported to and qualified on the HPC/Linux cluster following the specifications in NP 19-1 (Long, 2017, Long, 2020a)[3]. A comparison of the results for the CRA19 analysis showed few differences at the vector level, and the mean results were nearly identical. Based on the results included herein, the Linux system is operational and can reproduce, to an acceptable level, previous compliance recertification PA calculations. The Linux system is fully capable of running future PA calculations.

[3] The NP19-1 Software Requirements procedure was revised while this work was being performed. The changes were minor and did not have any impact on the work.

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6.0 REFERENCES

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7.0 APPENDIX A – CALCULATION FLOW

7.1 Inventory Decay Calculations (EPAUNI)

Table 2. The run script files used for EPAUNI were:

File	Repository	Comment
RunControl/EPAUNI.py	$REP1/CRA19_LX0/EPAUNI	Python run control script
RunControl/EPAUNIlib.py	$REP1/CRA19_LX0/EPAUNI	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/EPAUNI	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/EPAUNI	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 3. The input files used for EPAUNI were:

File	Repository	Comment
Input/epu_CRA19_LX0_ch.inp	$REP1/CRA19_LX0/EPAUNI	Input file
Input/epu_CRA19_LX0_ch_misc.inp	$REP1/CRA19_LX0/EPAUNI	Input file
Input/epu_CRA19_LX0_rh.inp	$REP1/CRA19_LX0/EPAUNI	Input file
Input/epu_CRA19_LX0_rh_misc.inp	$REP1/CRA19_LX0/EPAUNI	Input file

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 4. The CVS repositories used for EPAUNI were:

CVS Repositories
$REP1/CRA19_LX0/EPAUNI
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/EPAUNI

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 5. The log files used for EPAUNI were:

File	Repository	Comment
RunControl/EPAUNI.log	$REP1/CRA19_LX0/EPAUNI	Log file
RunControl/EPAUNI.rtf	$REP1/CRA19_LX0/EPAUNI	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 6. The output files produced for EPAUNI were:

File	Repository	Comment
Output/epu_CRA19_LX0_ch.dat	$REP1/CRA19_LX0/EPAUNI	Results file
Output/epu_CRA19_LX0_ch.dia	$REP1/CRA19_LX0/EPAUNI	Diagnostic file (units)
Output/epu_CRA19_LX0_ch.out	$REP1/CRA19_LX0/EPAUNI	Results file (times)

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Output/epu_CRA19_LX0_ch.out2	$REP1/CRA19_LX0/EPAUNI	Results file (format 2)
Output/epu_CRA19_LX0_ch_activity.dia	$REP1/CRA19_LX0/EPAUNI	Diagnostic file (activity)
Output/epu_CRA19_LX0_rh.dat	$REP1/CRA19_LX0/EPAUNI	Results file
Output/epu_CRA19_LX0_rh.dia	$REP1/CRA19_LX0/EPAUNI	Diagnostic file (units)
Output/epu_CRA19_LX0_rh.out	$REP1/CRA19_LX0/EPAUNI	Results file (times)
Output/epu_CRA19_LX0_rh.out2	$REP1/CRA19_LX0/EPAUNI	Results file (format 2)
Output/epu_CRA19_LX0_rh_activity.dia	$REP1/CRA19_LX0/EPAUNI	Diagnostic file (activity)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 7. The executable file used for EPAUNI was:

File	Repository	Comment
Build/Linux/epauni (Ver:1.20)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/EPAUNI	Computes decay of radionuclide components in inventory

7.2 Sampling of Uncertain Parameters (LHS)

Table 8. The run script files used for LHS were:

File	Repository	Comment
RunControl/LHS.py	$REP1/CRA19_LX0/LHS	Python run control script
RunControl/LHSlib.py	$REP1/CRA19_LX0/LHS	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/LHS	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/LHS	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 9. The input files used for LHS were:

File	Repository	Comment
Input/lhs1_CRA19_LX0_r*i*_con.inp	$REP1/CRA19_LX0/PRELHS	Input file
Input/lhs2_CRA19_LX0_rep1.txt	$REP1/CRA19_LX0/LHS	Input file
Input/lhs2_CRA19_LX0_rep2.txt	$REP1/CRA19_LX0/LHS	Input file
Input/lhs2_CRA19_LX0_rep3.txt	$REP1/CRA19_LX0/LHS	Input file

Where:
i is 1-3
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 10. The CVS repositories used for LHS were:

CVS Repositories
$REP1/CRA19_LX0/LHS
$REP1/CRA19_LX0/PRELHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/LHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRELHS

Where:

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$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 11. The log files used for LHS were:

File	Repository	Comment
RunControl/LHS.log	$REP1/CRA19_LX0/LHS	Log file
RunControl/LHS.rtf	$REP1/CRA19_LX0/LHS	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 12. The output files produced for LHS were:

File	Repository	Comment
Output/lhs1_CRA19_LX0_*ri*_con.dbg	$REP1/CRA19_LX0/PRELHS	Debug file
Output/lhs1_CRA19_LX0_*ri*_con.trn	$REP1/CRA19_LX0/PRELHS	Transfer file
Output/lhs2_CRA19_LX0_*ri*_con.dbg	$REP1/CRA19_LX0/LHS	Debug file
Output/lhs2_CRA19_LX0_*ri*_con.trn	$REP1/CRA19_LX0/LHS	Transfer file

Where:
i is 1-3
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 13. The executable files used for LHS were:

File	Repository	Comment
Build/Linux/lhs (Ver:3.00)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/LHS	Code to sample uncertain parameters
Build/Linux/prelhs (Ver:2.45)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRELHS	Pre-processes data for lhs

7.3 Salado Flow Calculations (BRAGFLO)

Table 14. The run script files used for BRAGFLO were:

File	Repository	Comment
RunControl/BRAGFLO.py	$REP1/CRA19_LX0/BRAGFLO	Python run control script
RunControl/BRAGFLOlib.py	$REP1/CRA19_LX0/BRAGFLO	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/BRAGFLO	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/BRAGFLO	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 15. The input files used for BRAGFLO were:

File	Repository	Comment
Input/alg1_bf_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_bf_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/bf1_CRA19_LX0_*sn*.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_CRA19_LX0_*sn*_mod1.inp	$REP1/CRA19_LX0/PREBRAG	Input file

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Input/bf1_CRA19_LX0_*sn*_mod2.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf2_CRA19_LX0_closure.dat	$REP1/CRA19_LX0/BRAGFLO	Input file
Input/gm_bf_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/ic_bf_CRA19_LX0.inp	$REP1/CRA19_LX0/ICSET	Input file
Input/ms_bf_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file

Where:
n is 1-6
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 16. The CVS repositories used for BRAGFLO were:

CVS Repositories
$REP1/CRA19_LX0/ALGEBRACDB
$REP1/CRA19_LX0/BRAGFLO
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/ICSET
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/POSTLHS
$REP1/CRA19_LX0/PREBRAG
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/BRAGFLO
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ICSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTBRAG
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PREBRAG

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 17. The log files used for BRAGFLO were:

File	Repository	Comment
RunControl/BRAGFLO.log	$REP1/CRA19_LX0/BRAGFLO	Log file
RunControl/BRAGFLO.rtf	$REP1/CRA19_LX0/BRAGFLO	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 18. The output files produced for BRAGFLO were:

File	Repository	Comment
Output/alg1_bf_CRA19_LX0_*ri*_*vvvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_bf_CRA19_LX0_*ri*_*sn*_*vvvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/bf2_CRA19_LX0_*ri*_*sn*_*vvvv*.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Output/bf2_CRA19_LX0_*ri*_*sn*_*vvvv*.log	$REP1/CRA19_LX0/BRAGFLO	Log file
Output/bf2_CRA19_LX0_*ri*_*sn*_*vvvv*.sum	$REP1/CRA19_LX0/BRAGFLO	Summary file
Output/bf3_CRA19_LX0_*ri*_*sn*_*vvvv*.cdb	$REP1/CRA19_LX0/BRAGFLO	CDB transfer file
Output/gm_bf_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file

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Output/ic_bf_CRA19_LX0_ri_vvvv.cdb	$REP1/CRA19_LX0/ICSET	CDB transfer file
Output/lhs3_bf_CRA19_LX0_ri_vvvv.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/ms_bf_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file

Where:
i is 1-3
n is 1-6
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 19. The executable files used for BRAGFLO were:

File	Repository	Comment
Build/Linux/algebracdb (Ver:2.37)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB	Manipulates CAMDAT data by evaluating algebraic expressions
Build/Linux/bragflo (Ver:7.01)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/BRAGFLO	Computes brine and gas flow in the repository
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/icset (Ver:2.24)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ICSET	Assigns initial conditions to the CAMDAT grid elements
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/postbrag (Ver:4.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTBRAG	Post-processes data for bragflo
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/prebrag (Ver:9.01)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PREBRAG	Pre-processes data for bragflo

7.4 Actinide Mobilization Calculations (PANEL)

Table 20. The run script files used for PANEL were:

File	Repository	Comment
RunControl/PANEL.py	$REP1/CRA19_LX0/PANEL	Python run control script
RunControl/PANELlib.py	$REP1/CRA19_LX0/PANEL	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/PANEL	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/PANEL	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 21. The input files used for PANEL were:

File	Repository	Comment
Input/alg1_panel_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Output/alg2_bf_CRA19_LX0_ri_sn_vvvv.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file

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Input/alg2_panel_CRA19_LX0_b1.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_panel_CRA19_LX0_b2.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_panel_CRA19_LX0_b3.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_panel_CRA19_LX0_b4.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_panel_CRA19_LX0_b5.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_panel_CRA19_LX0_b1.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_panel_CRA19_LX0_b2.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_panel_CRA19_LX0_b3.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_panel_CRA19_LX0_b4.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_panel_CRA19_LX0_b5.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/gm_panel_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/ms_panel_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Input/sum_panel_con.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_panel_int.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_panel_st.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file

Where:
i is 1-3
n is 1-6
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 22. The CVS repositories used for PANEL were:

CVS Repositories
$REP1/CRA19_LX0/ALGEBRACDB
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/PANEL
$REP1/CRA19_LX0/POSTLHS
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PANEL
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 23. The log files used for PANEL were:

File	Repository	Comment
RunControl/PANEL.log	$REP1/CRA19_LX0/PANEL	Log file
RunControl/PANEL.rtf	$REP1/CRA19_LX0/PANEL	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

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Table 24. The output files produced for PANEL were:

File	Repository	Comment
Output/alg1_panel_CRA19_LX0.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_panel_CRA19_LX0_b1.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_panel_CRA19_LX0_b2.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_panel_CRA19_LX0_b3.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_panel_CRA19_LX0_b4.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_panel_CRA19_LX0_b5.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_panel_CRA19_LX0_b1_rj_vwww.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_panel_CRA19_LX0_b2_rj_vwww.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_panel_CRA19_LX0_b3_rj_vwww.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_panel_CRA19_LX0_b4_rj_vwww.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_panel_CRA19_LX0_b5_rj_vwww.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/gm_panel_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/lhs3_panel_CRA19_LX0_b1_rj_vwww.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/lhs3_panel_CRA19_LX0_b2_rj_vwww.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/lhs3_panel_CRA19_LX0_b3_rj_vwww.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/lhs3_panel_CRA19_LX0_b4_rj_vwww.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/lhs3_panel_CRA19_LX0_b5_rj_vwww.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/ms_panel_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file
Output/panel_con_CRA19_LX0_b1_rj_sq_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_con_CRA19_LX0_b2_rj_sq_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_con_CRA19_LX0_b3_rj_sq_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_con_CRA19_LX0_b4_rj_sq_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_con_CRA19_LX0_b5_rj_sq_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_decay_CRA19_LX0_ri_sn_vvvv.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_int_CRA19_LX0_b1_rj_so_ttttt_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file

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Output/panel_int_CRA19_LX0_b2_rj_so_ttttt_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_int_CRA19_LX0_b3_rj_so_ttttt_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_int_CRA19_LX0_b4_rj_so_ttttt_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/panel_int_CRA19_LX0_b5_rj_so_ttttt_vwww.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file
Output/sum_panel_con_CRA19_LX0_b1_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b2_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b3_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b4_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b5_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b1_rj_so_ttttt.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b2_rj_so_ttttt.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b3_rj_so_ttttt.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b4_rj_so_ttttt.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b5_rj_so_ttttt.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b1_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b2_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b3_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b4_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b5_rj_sp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:

i is 1
j is 1-3
n is 1
o is 6
p is 1-2
q is 1-6
ttttt is 00100, 00350, 01000, 02000, 04000, 06000, 09000
vvv is 001
www is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

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Table 25. The executable files used for PANEL were:

File	Repository	Comment
Build/Linux/algebracdb (Ver:2.37)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB	Manipulates CAMDAT data by evaluating algebraic expressions
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/panel (Ver:5.01)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PANEL	Computes release concentrations of nuclides from repository
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/summarize (Ver:3.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE	Writes tables of data from many CAMDAT files

7.5 Salado Transport Calculations (NUTS)

Table 26. The run script files used for NUTS were:

File	Repository	Comment
RunControl/NUTS.py	$REP1/CRA19_LX0/NUTS	Python run control script
RunControl/NUTSlib.py	$REP1/CRA19_LX0/NUTS	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/NUTS	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/NUTS	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 27. The input files used for NUTS were:

File	Repository	Comment
Input/alg_nut_iso_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg_nut_scn_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Output/bf2_CRA19_LX0_*ri*_*sn*_*vvvv*.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Output/bf3_CRA19_LX0_*ri*_*sn*_*vvvv*.cdb	$REP1/CRA19_LX0/BRAGFLO	CDB transfer file
Input/ms_nut_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Input/nut_int_CRA19_LX0_*so*_*ttttt*.inp	$REP1/CRA19_LX0/NUTS	Input file
Input/nut_iso_CRA19_LX0_*sn*.inp	$REP1/CRA19_LX0/NUTS	Input file
Input/nut_scn_CRA19_LX0_*sn*.inp	$REP1/CRA19_LX0/NUTS	Input file
Output/panel_con_CRA19_LX0_b1_*ri*_*sn*_*vvvv*.cdb	$REP1/CRA19_LX0/PANEL	CDB transfer file

Where:
i is 1-3
n is 1-5

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o is 2-5
ttttt is 0100 for S2, S4
03000, 05000, 07000, 09000 for S3, S5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 28. The CVS repositories used for NUTS were:

CVS Repositories
$REP1/CRA19_LX0/ALGEBRACDB
$REP1/CRA19_LX0/BRAGFLO
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/NUTS
$REP1/CRA19_LX0/PANEL
$REP1/CRA19_LX0/PREBRAG
$REP1/CRA19_LX0/SCREEN_NUTS
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/NUTS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SCREEN_NUTS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 29. The log files used for NUTS were:

File	Repository	Comment
RunControl/NUTS.log	$REP1/CRA19_LX0/NUTS	Log file
RunControl/NUTS.rtf	$REP1/CRA19_LX0/NUTS	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 30. The output files produced for NUTS were:

File	Repository	Comment
Output/alg_nut_int_CRA19_LX0_*ri*_so_*ttttt*_V*VVV*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg_nut_iso_CRA19_LX0_*ri*_*sn*_V*VVV*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg_nut_scn_CRA19_LX0_*ri*_*sn*_v*vvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/ms_nut_CRA19_LX0_*ri*_*sn*_V*VVV*.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file
Output/nut_int_CRA19_LX0_*ri*_so_*ttttt*_V*VVV*.cdb	$REP1/CRA19_LX0/NUTS	CDB transfer file
Output/nut_iso_CRA19_LX0_*ri*_*sn*_V*VVV*.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file
Output/nut_scn_CRA19_LX0_*ri*_*sn*_v*vvv*.cdb	$REP1/CRA19_LX0/NUTS	CDB transfer file

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Output/screen_nut_scn_CRA19_LX0_*ri*_EDIT.inp	$REP1/CRA19_LX0/SCREEN_NUTS	Input file
Output/screen_nut_scn_CRA19_LX0_*ri_sn*.out	$REP1/CRA19_LX0/SCREEN_NUTS	Output file
Output/sum_nut_CRA19_LX0_*ri_sn_tuuuuu*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_nut_scn_CRA19_LX0_*ri_sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:

i is 1-3
n is 1-5
o is 2-5
ttttt is 0100 for S2, S4
03000, 05000, 07000, 09000 for S3, S5
uuuuu is 0100 for s1
00100, 00350 for S2, S4
01000, 03000, 05000, 07000, 09000 for S3, S5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES
VVV are the screened-in vectors listed in Table 30.

Table 31. The screened-in vectors for NUTS were:

Replicate	Scenario	Vectors
1	1	1,2,5,6,7,8,9,10,12,13,14,17,19,20,22,23,24,25,26,27,28,29,30,34,35,36,38,41,43,44,45,46,47,49,50,51,52,53,54,55,58,59,60,61,62,63,64,66,67,69,70,71,72,76,78,79,80,82,83,84,86,88,89,92,93,96,98
1	2	1,2,5,6,7,8,9,10,12,13,14,17,19,20,22,23,24,25,26,27,28,29,30,34,35,36,38,41,43,44,45,46,47,49,50,51,52,53,54,55,58,59,60,61,62,63,64,66,67,69,70,71,72,76,78,79,80,82,83,84,86,88,89,92,93,96,98
1	3	1,2,5,6,7,8,9,12,13,14,17,20,22,23,24,25,26,27,28,29,30,34,35,36,38,41,43,44,45,46,47,49,50,51,52,53,54,55,59,60,61,62,63,64,66,67,70,71,76,78,80,82,83,84,86,88,89,93,96,98
1	4	7,9,30,36,45,50,53,55
1	5	7,9,30,36,45,50,53
2	1	1,2,3,4,6,8,9,12,14,16,17,18,19,21,24,25,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,43,44,45,48,49,50,51,52,53,54,55,56,59,63,64,65,66,67,68,71,72,74,75,77,79,80,83,84,87,89,90,92,94,95,96,98,99,100
2	2	1,2,3,4,6,8,9,12,14,16,17,18,19,21,24,25,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,43,44,45,48,49,50,51,52,53,54,55,56,59,63,64,65,66,67,68,71,72,74,75,77,79,80,83,84,87,89,90,92,94,95,96,98,99,100
2	3	3,4,6,8,9,12,14,16,18,19,21,24,25,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,43,44,45,48,49,50,51,52,53,54,55,56,59,63,65,67,68,71,74,75,77,79,80,84,87,89,90,92,94,95,96,98,99,100
2	4	4,17,21,24,28,34,68
2	5	4,17,21,24,28,34,68
3	1	2,3,7,10,11,13,14,15,16,17,18,21,22,24,25,26,27,28,30,32,33,34,37,38,39,40,41,42,43,44,45,47,49,50,52,53,56,57,58,59,61,62,63,64,65,66,67,68,69,70,71,73,74,75,77,78,79,81,83,84,86,88,89,90,91,93,94,96,97,99,100

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3	2	2,3,7,10,11,13,14,15,16,17,18,21,22,24,25,26,27,28,30,32,33,34,37,38,39,40,41,42,43,44,45,47,49,50,52,53,56,57,58,59,61,62,63,64,65,66,67,68,69,70,71,73,74,75,77,78,79,81,83,84,86,88,89,90,91,93,94,96,97,99,100
3	3	2,3,7,10,11,14,18,21,22,26,27,30,32,33,34,37,39,40,42,43,44,45,47,49,50,53,56,57,58,59,61,62,63,64,65,66,67,68,69,70,71,73,74,75,77,78,79,84,86,88,89,90,91,93,94,96,97,99,100
3	4	37,42,47,66,86,91,93
3	5	42,47,66,86,91,93

Table 32. The executable files used for NUTS were:

File	Repository	Comment
Build/Linux/algebracdb (Ver:2.37)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB	Manipulates CAMDAT data by evaluating algebraic expressions
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/nuts (Ver:2.08)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/NUTS	Nuclide Transport system model
Build/Linux/screen_nuts (Ver:1.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SCREEN_NUTS	Executable file
Build/Linux/summarize (Ver:3.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE	Writes tables of data from many CAMDAT files

7.6 Single-Intrusion Spallings Volume Calculations (DRSPALL)

Table 33. The run script files used for DRSPALL were:

File	Repository	Comment
RunControl/DRSPALL.py	$REP1/CRA19_LX0/DRSPALL	Python run control script
RunControl/DRSPALLlib.py	$REP1/CRA19_LX0/DRSPALL	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/DRSPALL	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/DRSPALL	Main control script

Where:

$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 34. The input files used for DRSPALL were:

File	Repository	Comment
Input/drs_CRA19_LX0_mxt_p1.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_mxt_p2.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_mxt_p3.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_mxt_p4.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_p1.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_p2.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/drs_CRA19_LX0_p3.inp	$REP1/CRA19_LX0/DRSPALL	Input file

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Input/drs_CRA19_LX0_p4.inp	$REP1/CRA19_LX0/DRSPALL	Input file
Input/gm_drs_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/ms_drs_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Input/sum_drs_CRA19_LX0_sphere_p1.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_drs_CRA19_LX0_sphere_p2.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_drs_CRA19_LX0_sphere_p3.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_drs_CRA19_LX0_sphere_p4.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 35. The CVS repositories used for DRSPALL were:

CVS Repositories
$REP1/CRA19_LX0/DRSPALL
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/POSTLHS
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/DRSPALL
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MERGESPALL
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 36. The log files used for DRSPALL were:

File	Repository	Comment
RunControl/DRSPALL.log	$REP1/CRA19_LX0/DRSPALL	Log file
RunControl/DRSPALL.rtf	$REP1/CRA19_LX0/DRSPALL	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 37. The output files produced for DRSPALL were:

File	Repository	Comment
Output/drs_CRA19_LX0_cyl_*ri*_p2_v*yyy*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_cyl_*ri*_p3_v*vvv*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_cyl_*ri*_p4_v*www*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_*ri*_p1_v*xxx*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_*ri*_p2_v*xxx*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_*ri*_p3_v*xxx*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/drs_CRA19_LX0_*ri*_p4_v*xxx*.cdb	$REP1/CRA19_LX0/DRSPALL	CDB transfer file
Output/gm_drs_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/lhs3_drs_CRA19_LX0_*ri*_v*xxx*.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file

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Output/ms_drs_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file
Output/ms_drs_CRA19_LX0.xdbg	$REP1/CRA19_LX0/MATSET	Debug file
Output/mspall_drs_CRA19_LX0_*ri*.out	$REP1/CRA19_LX0/DRSPALL	Results file
Output/sum_drs_CRA19_LX0_cyl_*ri*_p2.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_cyl_*ri*_p3.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_cyl_*ri*_p4.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_sphere_*ri*_p1.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_sphere_*ri*_p2.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_sphere_*ri*_p3.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_drs_CRA19_LX0_sphere_*ri*_p4.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:

i is 1-3
vvv is 001, 025, 032, 041, 059, 071, 086
www is 001, 002, 025, 028, 032, 041, 059, 067, 068, 071, 086
xxx is 001-100
yyy is 025, 032, 041
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 38. The executable files used for DRSPALL were:

File	Repository	Comment
Build/Linux/drspall (Ver:1.24)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/DRSPALL	Computes volume of waste from drilling
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/mergespall (Ver:1.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MERGESPALL	Executable file
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/summarize (Ver:3.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE	Writes tables of data from many CAMDAT files

7.7 Single-Intrusion Solids Volume Calculations (CUTTINGS_S)

Table 39. The run script files used for CUTTINGS_S were:

File	Repository	Comment
RunControl/CUTTINGS_S.py	$REP1/CRA19_LX0/CUTTINGS_S	Python run control script

Information Only

RunControl/CUTTINGS_Slib.py	$REP1/CRA19_LX0/CUTTINGS_S	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/CUTTINGS_S	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/CUTTINGS_S	Main control script

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 40. The input files used for CUTTINGS_S were:

File	Repository	Comment
Output/bf3_CRA19_LX0_*ri*_*sn*_*vvvv*.cdb	$REP1/CRA19_LX0/BRAGFLO	CDB transfer file
Input/cusp_CRA19_LX0.inp	$REP1/CRA19_LX0/CUTTINGS_S	Input file
Input/gm_cusp_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/ms_cusp_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Output/mspall_drs_CRA19_LX0_*ri*.out	$REP1/CRA19_LX0/DRSPALL	Input file

Where:
i is 1-3
n is 1-5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 41. The CVS repositories used for CUTTINGS_S were:

CVS Repositories
$REP1/CRA19_LX0/BRAGFLO
$REP1/CRA19_LX0/CUTTINGS_S
$REP1/CRA19_LX0/DRSPALL
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CUTTINGS_S
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 42. The log files used for CUTTINGS_S were:

File	Repository	Comment
RunControl/CUTTINGS_S.log	$REP1/CRA19_LX0/CUTTINGS_S	Log file
RunControl/CUTTINGS_S.rtf	$REP1/CRA19_LX0/CUTTINGS_S	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 43. The output files produced for CUTTINGS_S were:

File	Repository	Comment

Information Only

Output/cusp_CRA19_LX0_master_*ri*.inp	$REP1/CRA19_LX0/CUTTINGS_S	Input file
Output/cusp_CRA19_LX0_*ri*.tbl	$REP1/CRA19_LX0/CUTTINGS_S	Table file
Output/cusp_CRA19_LX0_*ri*_*sn*_*ttttt*_L_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Output/cusp_CRA19_LX0_*ri*_*sn*_*ttttt*_M_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Output/cusp_CRA19_LX0_*ri*_*sn*_*ttttt*_U_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Output/gm_cusp_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/lhs3_cusp_CRA19_LX0_*ri*_*vvvv*.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/ms_cusp_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file

Where:

i is 1-3
n is 1-5
ttttt is 00100, 00350, 01000, 03000, 05000, 10000 for S1
00550, 00750, 02000, 04000, 10000 for S2, S4
01200, 01400, 03000, 05000, 10000 for S3, S5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 44. The executable files used for CUTTINGS_S were:

File	Repository	Comment
Build/Linux/cuttings_s (Ver:6.04)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CUTTINGS_S	Computes cuttings/spall generated by drilling
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements

7.8 Single-Intrusion Direct Brine Release Calculations (BRAGFLO-DBR)

Table 45. The run script files used for BRAGFLO-DBR were:

File	Repository	Comment
RunControl/BRAGFLO_DBR.py	$REP1/CRA19_LX0/BRAGFLO_DBR	Python run control script
RunControl/BRAGFLO_DBRlib.py	$REP1/CRA19_LX0/BRAGFLO_DBR	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/BRAGFLO_DBR	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/BRAGFLO_DBR	Main control script

Where:

$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Information Only

Table 46. The input files used for BRAGFLO-DBR were:

File	Repository	Comment
Input/alg1_dbr_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg2_dbr_CRA19_LX0_*so*.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_dbr_CRA19_LX0_L.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_dbr_CRA19_LX0_M.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/alg3_dbr_CRA19_LX0_U.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/bf1_dbr_CRA19_LX0_L.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_dbr_CRA19_LX0_M.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_dbr_CRA19_LX0_*sn*_100_L.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_dbr_CRA19_LX0_*sn*_100_M.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_dbr_CRA19_LX0_*sn*_100_U.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Input/bf1_dbr_CRA19_LX0_U.inp	$REP1/CRA19_LX0/PREBRAG	Input file
Output/bf3_CRA19_LX0_*ri*_*so*_*vvvv*.cdb	$REP1/CRA19_LX0/BRAGFLO	CDB transfer file
Output/cusp_CRA19_LX0_*ri*_*so*_*ttttt*_L_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Output/cusp_CRA19_LX0_*ri*_*so*_*ttttt*_M_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Output/cusp_CRA19_LX0_*ri*_*so*_*ttttt*_U_*vvvv*.cdb	$REP1/CRA19_LX0/CUTTINGS_S	CDB transfer file
Input/gm_dbr_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/ic_dbr_CRA19_LX0_*so*.inp	$REP1/CRA19_LX0/ICSET	Input file
Input/ms_dbr_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Input/rel1_dbr_CRA19_LX0.inp	$REP1/CRA19_LX0/RELATE	Input file
Input/rel2_dbr_CRA19_LX0_*so*.inp	$REP1/CRA19_LX0/RELATE	Input file
Input/sum_dbr.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file

Where:

i is 1-3
n is 1
o is 1-5
ttttt is 00100, 00350, 01000, 03000, 05000, 10000 for S1
00550, 00750, 02000, 04000, 10000 for S2, S4
01200, 01400, 03000, 05000, 10000 for S3, S5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 47. The CVS repositories used for BRAGFLO-DBR were:

CVS Repositories
$REP1/CRA19_LX0/ALGEBRACDB
$REP1/CRA19_LX0/BRAGFLO
$REP1/CRA19_LX0/BRAGFLO_DBR
$REP1/CRA19_LX0/CUTTINGS_S
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/ICSET
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/PREBRAG
$REP1/CRA19_LX0/RELATE
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB

Information Only

/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/BRAGFLO
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ICSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTBRAG
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PREBRAG
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/RELATE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 48. The log files used for BRAGFLO-DBR were:

File	Repository	Comment
RunControl/BRAGFLO_DBR.log	$REP1/CRA19_LX0/BRAGFLO_DBR	Log file
RunControl/BRAGFLO_DBR.rtf	$REP1/CRA19_LX0/BRAGFLO_DBR	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 49. The output files produced for BRAGFLO-DBR were:

File	Repository	Comment
Output/alg1_dbr_CRA19_LX0_*ri_sn_ttttt_vvv*v.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg2_dbr_CRA19_LX0_*ri_sn_ttttt_vvv*v.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_dbr_CRA19_LX0_*ri_sn_ttttt*_L_v*vvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_dbr_CRA19_LX0_*ri_sn_ttttt*_M_v*vvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/alg3_dbr_CRA19_LX0_*ri_sn_ttttt*_U_v*vvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/bf2_dbr_CRA19_LX0_*ri_sn_ttttt*_L_vv*vv*.inp	$REP1/CRA19_LX0/BRAGFLO_DBR	Input file
Output/bf2_dbr_CRA19_LX0_*ri_sn_ttttt*_M_vv*vv*.inp	$REP1/CRA19_LX0/BRAGFLO_DBR	Input file
Output/bf2_dbr_CRA19_LX0_*ri_sn_ttttt*_U_vv*vv*.inp	$REP1/CRA19_LX0/BRAGFLO_DBR	Input file
Output/bf3_dbr_CRA19_LX0_*ri_sn_ttttt*_L_vv*vv*.cdb	$REP1/CRA19_LX0/BRAGFLO_DBR	CDB transfer file
Output/bf3_dbr_CRA19_LX0_*ri_sn_ttttt*_M_vv*vv*.cdb	$REP1/CRA19_LX0/BRAGFLO_DBR	CDB transfer file
Output/bf3_dbr_CRA19_LX0_*ri_sn_ttttt*_U_vv*vv*.cdb	$REP1/CRA19_LX0/BRAGFLO_DBR	CDB transfer file
Output/gm_dbr_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/ic_dbr_CRA19_LX0_*ri_sn_ttttt_vvvv*.cdb	$REP1/CRA19_LX0/ICSET	CDB transfer file
Output/ms_dbr_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file

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Output/rel1_dbr_CRA19_LX0_*ri_sn_ttttt_vvvv*.cdb	$REP1/CRA19_LX0/RELATE	CDB transfer file
Output/rel2_dbr_CRA19_LX0_*ri_sn_ttttt_vvvv*.cdb	$REP1/CRA19_LX0/RELATE	CDB transfer file
Output/sum_dbr_CRA19_LX0_*ri_sn_ttttt*_L.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_dbr_CRA19_LX0_*ri_sn_ttttt*_M.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_dbr_CRA19_LX0_*ri_sn_ttttt*_U.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:
i is 1-3
n is 1-5
ttttt is 00100, 00350, 01000, 03000, 05000, 10000 for S1
00550, 00750, 02000, 04000, 10000 for S2, S4
01200, 01400, 03000, 05000, 10000 for S3, S5
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 50. The executable files used for BRAGFLO-DBR were:

File	Repository	Comment
Build/Linux/algebracdb (Ver:2.37)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB	Manipulates CAMDAT data by evaluating algebraic expressions
Build/Linux/bragflo (Ver:7.01)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/BRAGFLO	Computes brine and gas flow in the repository
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/icset (Ver:2.24)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ICSET	Assigns initial conditions to the CAMDAT grid elements
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/postbrag (Ver:4.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTBRAG	Post-processes data for bragflo
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/prebrag (Ver:9.01)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PREBRAG	Pre-processes data for bragflo
Build/Linux/relate (Ver:1.46)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/RELATE	Transfers CAMDAT data to another CAMDAT file
Build/Linux/summarize (Ver:3.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE	Writes tables of data from many CAMDAT files

7.9 Culebra Transport Calculations (SECOTP2D)

Table 51. The run script files used for SECOTP2D were:

File	Repository	Comment
RunControl/rc.py	$REP1/CRA19_LX0/SECOTP2D	Run control module

Information Only

RunControl/Run.py	$REP1/CRA19_LX0/SECOTP2D	Main control script
RunControl/SECOTP2D.py	$REP1/CRA19_LX0/SECOTP2D	Python run control script
RunControl/SECOTP2Dlib.py	$REP1/CRA19_LX0/SECOTP2D	Python run control script class modules

Where:

$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 52. The input files used for SECOTP2D were:

File	Repository	Comment
Input/alg_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/ALGEBRACDB	Input file
Input/gm_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/grope_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/GROPECDB	Input file
Input/keepers	$REP1/CRA19_LX0/MODFLOW	Input file
Input/ms_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Output/R1	$REP1/CRA19_LX0/MODFLOW	Input file
Output/R2	$REP1/CRA19_LX0/MODFLOW	Input file
Output/R3	$REP1/CRA19_LX0/MODFLOW	Input file
Input/rel_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/RELATE	Input file
Input/st2d1_CRA19_LX0.inp	$REP1/CRA19_LX0/PRESECOTP2D	Input file
Input/st2d1_CRA19_LX0_mod.inp	$REP1/CRA19_LX0/PRESECOTP2D	Input file
Input/sum1_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file
Input/sum_st2d_CRA19_LX0.inp	$REP1/CRA19_LX0/SUMMARIZE	Input file

Where:

$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 53. The CVS repositories used for SECOTP2D were:

CVS Repositories
$REP1/CRA19_LX0/ALGEBRACDB
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/GROPECDB
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/MODFLOW
$REP1/CRA19_LX0/POSTLHS
$REP1/CRA19_LX0/POSTSECOTP2D
$REP1/CRA19_LX0/PRESECOTP2D
$REP1/CRA19_LX0/RELATE
$REP1/CRA19_LX0/SECOTP2D
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GROPECDB
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTSECOTP2D
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRESECOTP2D
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/RELATE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SECOTP2D
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE

Information Only

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 54. The log files used for SECOTP2D were:

File	Repository	Comment
RunControl/SECOTP2D.log	$REP1/CRA19_LX0/SECOTP2D	Log file
RunControl/SECOTP2D.rtf	$REP1/CRA19_LX0/SECOTP2D	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 55. The output files produced for SECOTP2D were:

File	Repository	Comment
Output/alg_st2d_CRA19_LX0_r*i*_v*vvv*.cdb	$REP1/CRA19_LX0/ALGEBRACDB	CDB transfer file
Output/gm_st2d_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/lhs3_st2d_CRA19_LX0_r*i*_v*vvv*.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/ms_st2d_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file
Output/rel_st2d_CRA19_LX0_r*i*_v*vvv*.cdb	$REP1/CRA19_LX0/RELATE	CDB transfer file
Output/st2d2_CRA19_LX0_r*i*_mf_v*vvv*.xbin	$REP1/CRA19_LX0/SECOTP2D	Binary transfer file
Output/st2d2_CRA19_LX0_r*i*_mp_v*vvv*.xbin	$REP1/CRA19_LX0/SECOTP2D	Binary transfer file
Output/st2d3_CRA19_LX0_r*i*_mf_v*vvv*.cdb	$REP1/CRA19_LX0/POSTSECOTP2D	CDB transfer file
Output/st2d3_CRA19_LX0_r*i*_mp_v*vvv*.cdb	$REP1/CRA19_LX0/POSTSECOTP2D	CDB transfer file
Output/sum1_st2d_CRA19_LX0_r*i*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_st2d_CRA19_LX0_r*i*_mf.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_st2d_CRA19_LX0_r*i*_mp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:
i is 1-3
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 56. The executable files used for SECOTP2D were:

File	Repository	Comment
Build/Linux/algebracdb (Ver:2.37)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/ALGEBRACDB	Manipulates CAMDAT data by evaluating algebraic expressions
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/gropecdb (Ver:2.14)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GROPECDB	Displays CAMDAT data in text form
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/postsecotp2d (Ver:1.06)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTSECOTP2D	Post-processes data for secotp2d

Information Only

Build/Linux/presecotp2d (Ver:1.24)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRESECOTP2D	Pre-processes data for secotp2d
Build/Linux/relate (Ver:1.46)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/RELATE	Transfers CAMDAT data to another CAMDAT file
Build/Linux/secotp2d (Ver:1.44)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SECOTP2D	SECO 2D transport code
Build/Linux/summarize (Ver:3.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/SUMMARIZE	Writes tables of data from many CAMDAT files

7.10 CCDF Construction (CCDFGF)

Table 57. The run script files used for CCDFGF were:

File	Repository	Comment
RunControl/CCDFGF.py	$REP1/CRA19_LX0/CCDFGF	Python run control script
RunControl/CCDFGFlib.py	$REP1/CRA19_LX0/CCDFGF	Python run control script class modules
RunControl/rc.py	$REP1/CRA19_LX0/CCDFGF	Run control module
RunControl/Run.py	$REP1/CRA19_LX0/CCDFGF	Main control script

Where:

$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 58. The input files used for CCDFGF were:

File	Repository	Comment
Input/ccgf_CRA19_LX0_control_*ri*.inp	$REP1/CRA19_LX0/CCDFGF	Input file
Output/cusp_CRA19_LX0_*ri*.tbl	$REP1/CRA19_LX0/CUTTINGS_S	Table file
Output/epu_CRA19_LX0_ch.dat	$REP1/CRA19_LX0/EPAUNI	Table file
Output/epu_CRA19_LX0_rh.dat	$REP1/CRA19_LX0/EPAUNI	Table file
Input/gm_ccgf_CRA19_LX0.inp	$REP1/CRA19_LX0/GENMESH	Input file
Input/intrusiontimes.in	$REP1/CRA19_LX0/PRECCDFGF	Input file
Input/ms_ccgf_CRA19_LX0.inp	$REP1/CRA19_LX0/MATSET	Input file
Output/sum_dbr_CRA19_LX0_*ri*_so_*tvvvvv*_L.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_dbr_CRA19_LX0_*ri*_so_*tvvvvv*_M.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_dbr_CRA19_LX0_*ri*_so_*tvvvvv*_U.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_nut_CRA19_LX0_*ri*_so_*tuuuuu*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b1_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b2_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b3_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b4_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_con_CRA19_LX0_b5_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_int_CRA19_LX0_b1_*ri*_*sp*_*ttttt*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b1_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b2_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b3_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b4_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_panel_st_CRA19_LX0_b5_*ri*_*sn*.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_st2d_CRA19_LX0_*ri*_mf.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file
Output/sum_st2d_CRA19_LX0_*ri*_mp.tbl	$REP1/CRA19_LX0/SUMMARIZE	Table file

Where:

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i is 1-3
n is 1-2
o is 1-5
p is 6
ttttt is 00100, 00350, 01000, 02000, 04000, 06000, 09000
uuuuu is 0100 for s1
00100, 00350 for S2, S4
01000, 03000, 05000, 07000, 09000 for S3, S5
vvvvv is 00100, 00350, 01000, 03000, 05000, 10000 for S1
00550, 00750, 02000, 04000, 10000 for S2, S4
01200, 01400, 03000, 05000, 10000 for S3, S5
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 59. The CVS repositories used for CCDFGF were:

CVS Repositories
$REP1/CRA19_LX0/CCDFGF
$REP1/CRA19_LX0/CUTTINGS_S
$REP1/CRA19_LX0/EPAUNI
$REP1/CRA19_LX0/GENMESH
$REP1/CRA19_LX0/MATSET
$REP1/CRA19_LX0/POSTLHS
$REP1/CRA19_LX0/PRECCDFGF
$REP1/CRA19_LX0/SUMMARIZE
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CCDFGF
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CCDFVECTORSTATS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS
/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRECCDFGF

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 60. The log files used for CCDFGF were:

File	Repository	Comment
RunControl/CCDFGF.log	$REP1/CRA19_LX0/CCDFGF	Log file
RunControl/CCDFGF.rtf	$REP1/CRA19_LX0/CCDFGF	Formatted log file (Word file)

Where:
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 61. The output files produced for CCDFGF were:

File	Repository	Comment
Output/ccgf_CRA19_LX0_reltab_*ri*.dat	$REP1/CRA19_LX0/PRECCDFGF	Results file
Output/ccgf_CRA19_LX0_*ri*.out	$REP1/CRA19_LX0/CCDFGF	Results file
Output/gm_ccgf_CRA19_LX0.cdb	$REP1/CRA19_LX0/GENMESH	CDB transfer file
Output/lhs3_ccgf_CRA19_LX0_*ri*_*vvvv*.cdb	$REP1/CRA19_LX0/POSTLHS	CDB transfer file
Output/ms_ccgf_CRA19_LX0.cdb	$REP1/CRA19_LX0/MATSET	CDB transfer file

Information Only

Where:
i is 1-3
vvv is 001-100
$REP1 = /data/cvs/CVSLIB/WIPP_ANALYSES

Table 62. The executable files used for CCDFGF were:

File	Repository	Comment
Build/Linux/ccdfgf (Ver:7.06)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CCDFGF	Constructs complimentary cumulative distribution functions for radionuclide releases
Build/Linux/ccdfvectorstats (Ver:1.02)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/CCDFVECTORSTATS	Executable file
Build/Linux/genmesh (Ver:6.11)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/GENMESH	Generates the CAMDAT computational grid
Build/Linux/matset (Ver:9.25)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/MATSET	Assigns material properties to CAMDAT grid blocks
Build/Linux/postlhs (Ver:4.12)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/POSTLHS	Assigns sampled parameters to the grid blocks and elements
Build/Linux/preccdfgf (Ver:2.03)	/data/cvs/CVSLIB/WIPP_CODES/PA_CODES/PRECCDFGF	Pre-processes data for ccdfgf

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