RESERVE BANK OF AUSTRALIA

Reporting Template Specification for Repo-Eligible Securities
Residential Mortgage Backed Securities
Cash Flow Waterfall Template

Version: April 2013

1. Purpose

This document sets out the *cash flow waterfall* template of repo-eligible RMBS. The template requires issuers of repo-eligible RMBS (or their representatives) to report transparent, clear and comprehensive models of the cash flow waterfall structures of their RMBS issues in a uniform computer language format that is made publicly available. RMBS issuers are required only to report models of the RMBS liability structures. They are not required to provide projections of future collateral pool cash flows or projections of exogenous factors, such as counterparty downgrades, that can affect the distribution of cash flows.

2. What is a cash flow waterfall?

The cash flow waterfall is the mechanism that distributes the income generated in each collection period by the collateral pool – payments of interest and principal on the mortgages, recoveries on defaulted mortgages, reimbursements from mortgage insurers etc. – to the RMBS notes and counterparties. Furthermore, the waterfall describes the mechanism that allocates the losses experienced by the collateral pool to the RMBS notes. The income and loss distribution mechanisms are set at the issuance of the RMBS, and are contained in the Information Memorandum of each RMBS. However, this information can be difficult to interpret for investors and describe in a form that is useful for analysis of RMBS.

3. Frequency of reporting

The cash flow waterfall template should be reported on an ongoing basis at the same frequency as the RMBS distributions. If the RMBS has a mixture of distribution frequencies, then the cash flow waterfall template should be reported at the highest frequency distribution period. For example, the waterfall of an RMBS that has both notes with monthly and quarterly distributions should have its waterfall reported monthly. The waterfall template must be lodged no later than seven calendar days after the RMBS Trust issuer's specified coupon payment dates.

4. Waterfall reporting

Repo-eligible RMBS are required to have their cash flow waterfall reported in a computer program (the *waterfall program*) with all of the program code made publicly available. In particular, the waterfall should be reported in a *Microsoft Excel* file with the waterfall program contained in a *Visual Basic for Applications* code included in the file. The Microsoft Excel file should be updated on each reporting date and should contain:

a) *Waterfall program* in the form of a Visual Basic for Applications function called 'Waterfall_1' contained in a module called 'Waterfall_1'. The program should map the cash flows from the

collateral pool in any given period to the RMBS note holders and counterparties in that period according to the full set of rules specified in an RMBS Information Memorandum. Each period, this program will take as input all relevant information – principally the cash flows from the collateral pool for that period, outstanding balances on the RMBS notes etc. – and produce as an output the distribution of these cash flows to the RMBS notes and service providers. The specifics of the waterfall program will vary across RMBS, but, in its essence, the program should be a sequence of logical statements that examine the sufficiency of the cash flows from the collateral pool to meet payments to the RMBS notes in accordance with the Information Memorandum. The full program code should be made completely visible in the reported cash flow waterfall template (see below for detailed requirements for the waterfall program).

b) *Metadata sheet* (called Metadata) that provides a description of all inputs and outputs of the waterfall program, including their measurement units and formats.

c) *Waterfall sheet* (called Waterfall) organized so that the inputs and outputs of the cash flow waterfall on each reporting date are contained in a single row, each variable is contained in a single column and reporting dates are organized in ascending order. The sheet should, from left to right:

  i.   Include the history of all <u>inputs</u> into the cash flow waterfall program up to and including the current reporting date. For each reporting date the inputs should be contained in a single row in a continuous sequence of cells. These inputs are expected to include, but are not limited to, distribution date, accrual factors, opening balances on the RMBS notes, cumulative chargeoffs on RMBS notes, available interest and principal income from the collateral pool, recoveries on defaulted mortgages, relevant market variables such as interest rates and exchange rates, and exogenous factors that trigger a change in the waterfall, such as a counterparty downgrade etc. All inputs that represent stock variables (such as RMBS notes balances and cumulative chargeoffs on RMBS notes) and triggers should be reported in their states just before the most recent determination date proceeding the reporting date (i.e. they should be reported as the opening balances in determining the cash flow distributions for the reporting period). Each input variable should be reported in a separate column and that column should be clearly labelled.

  ii. A column in which each row indicates the <u>version of the waterfall program</u> in effect for that reporting date. The waterfall program is allowed to change throughout the life of the RMBS but changes are expected to be very rare and should be explained by the issuer in a new description sheet (see below).

  iii. Apply the waterfall program to the inputs in 4(c)(i) separately for every single reporting date to produce the distributions to the RMBS notes and counterparties according to the reported waterfall program for that reporting date. The <u>waterfall program outputs</u> for a single reporting date should be produced only by a single call to the reported waterfall program, and should be returned as an array and stored in a single row in a continuous sequence of cells. The outputs are expected to include, but are not limited to, payments of senior fees, interest and principal payments on each RMBS note, chargeoffs on each RMBS note, cumulative chargeoffs on the notes, closing balances of the notes, indictors of whether relevant trigger events have occurred etc. All outputs that represent stock variables (such as RMBS notes balances and cumulative chargeoffs on RMBS notes) and triggers should be reported in their states just after distributions to the RMBS notes and counterparties are made for the reporting date (i.e. they should be reported as the closing balances after distributions of the collateral cash flows for that period). Each output variable should be reported in its own column that is clearly labelled.

iv.   Include the history of all actual distributions to the RMBS notes and counterparties, both principal and interest, note chargeoffs and closing balances and trigger events up to and including the current reporting date. For each reporting date these should be reported in a single row in a continuous sequence of cells. The reported actual distributions and losses should exhaust all available income and losses from the RMBS collateral pool during the reporting period, and should have corresponding outputs produced by the waterfall program. These correspondences should be clear and easy to identify in the waterfall template; to this end the ordering of the variables in 4(c)(iii) and 4(c)(iv) should match.

v.   Include the differences – for each distribution date up to and including the current reporting date – between the actual distributions to the RMBS notes and counterparties in 4(c)(iv) and the outputs produced by the waterfall program in 4(c)(iii). The differences for the following variables should be reported:
  - Principal and income payments to RMBS notes and counterparties
  - RMBS note chargeoffs
  - RMBS note closing balances following payments of principal, interest and charge offs.
Each of these differences should be reported in Australian dollars (or other relevant currency for RMBS notes that are denominated in other currencies).

vi.   Include the simple average – calculated over the life of the RMBS up to and including the reporting date – of the differences described in 4(c)(v) measured as a per cent of the corresponding actual distributions to the RMBS notes and counterparties, RMBS note chargeoffs, and closing balances in 4(c)(iv). Include the simple average of the absolute values of these deviations since the issuance of the RMBS.

d) *Description sheet* (called Description_1) that contains description of the waterfall in plain English and a schematic diagram describing the waterfall according to the RMBS Information Memorandum.

The Microsoft Excel file containing the waterfall template should be compatible with Microsoft Office 2010. The file should be reported in XLSM (Excel macro-enabled workbook file) format. It should be made publicly available, with all of its contents completely visible and transparent.

A guide to the minimum expected inputs and outputs for the waterfall program is provided in Appendix A. This is not an exhaustive list and is provided only as a guide. Each RMBS is unique and the reported waterfall should accurately and completely reflect its features. A sample Microsoft Excel file implementing the waterfall template is also provided and can be accessed at http://www.rba.gov.au/mkt-operations/xls/waterfall-template-for-repo-eligible-rmbs-sample.xlsm.

5. The waterfall program

The waterfall program should be written in Visual Basic for Applications (VBA) in a version compatible with Microsoft Office 2010. The program:

a) Should be an accurate representation of the waterfall according to the RMBS Information Memorandum.

b) Should have its code stored in a VBA module called *Waterfall_i* that contains a function called *Waterfall_i*, where *i* is a number 1, 2, 3, … etc. indicating the version of the waterfall program. The program is expected to be written as a single function using only standard VBA commands.

If nonstandard commands are necessary, for example to perform repetitive calculations, then these should be written as functions that are included in the same module as the main program. All these functions should be completely visible and transparent.

c) The waterfall program is allowed to change over the life of the RMBS; however, any changes are expected to be extremely rare because the waterfall is set at the RMBS issuance. Program versions, if any, should be labelled in a sequence. Each new version, including all of its supporting functions, should be stored in a new module. A new *Description sheet* (see above) called Description_i, where 'i' is the version of the new waterfall, should be created for each new version of the waterfall program and should explain the changes to the waterfall program and the reasons for making these changes. This explanation should be in plain English. Following revisions to the waterfall program, all previous versions should be kept in the reported Excel file (including the relevant description sheets).

d) Should take as input all relevant information required to determine the accurate distribution of the collateral cash flows to the RMBS notes and counterparties for any given distribution date. Principally, these inputs should be the cash flows from the collateral pool in the corresponding collection period, information that can trigger changes in the waterfall (collateral performance, distribution date, counterparty ratings etc.) outstanding balances of any structural facilities (i.e. reserve or liquidity facilities etc.) and market variables such as interest rates and exchange rates for the corresponding accrual period.

e) Should return as output an array that contains the distribution of the collateral pool cash flows to the RMBS note holders and counterparties, the balances of the RMBS notes after the distributions, chargeoffs to the RMBS notes, cumulative chargeoffs to the RMBS notes, flows in and out of structural facilities and balances of structural facilities. The output should be for a single distribution date.

f) The specifics of the program will vary across RMBS, but the program should be a sequence of logical statements that examine the sufficiency of the cash flows from the collateral pool to meet payments to the RMBS notes and counterparties in accordance with the RMBS Information Memorandum.

g) Should have all of its variables and their types declared. In the current version of VBA (version 7.0) this is achieved by including the statement *Option Explicit* at the start of the VBA module that contains the waterfall program. The program should include this statement or other statements achieving the same effect in future versions of VBA.

h) Should index arrays starting with 1. In the current version of VBA this is achieved by including the statement *Option Base 1* at the start of the VBA module that contains the waterfall. The program should include this statement or other equivalent statements achieving the same effect in future versions of VBA.

i) Should contain comments indicating the program's version and date that it has been created and is effective from. It should also contain comments identifying the RMBS transaction to which the waterfall applies (i.e. transaction ID, trust name etc.).

j) Should follow good programming practice and have extensive comments in plain English that would allow users to thoroughly understand the program. Each part of the program code should include a comment referencing the section(s) of the RMBS Information Memorandum (page numbers, and where available section and paragraph numbers) that are being modelled in that part of the program.

k) Should have all of its variables named so that their purpose is easy to understand. The variables' names should be written in full and properly capitalised. Where a variable's name consists of more than one word, each word should start with a capital letter. The purpose of each variable should be explained in a comment. Abbreviations (including acronyms) should be used in the variable names only when the meaning of the abbreviation is easily understandable; the meaning of any abbreviations used should be explained in comments.

6. Template validation

The issuer will be responsible for the accuracy and validity of the waterfall program. The template will be validated by comparing the cash flows generated by the waterfall program, particularly the distributions to the RMBS note holders and counterparties, against the actual distribution to the RMBS note holders and counterparties. Material or persistent deviations between modelled and actual cash flows to note holders and counterparties will result in an invalid waterfall template. The Reserve Bank of Australia reserves the right to review the reported waterfall and deem the template invalid, with the subsequent implications for repo-eligibility, if in the Bank's sole judgement the reported waterfall template is not an accurate representation of the RMBS waterfall.

At issuance of an RMBS there is no history against which the accuracy of the waterfall template can be judged. Therefore, the issuer will be responsible for publishing a statement from an experienced external auditor attesting that the waterfall program is accurate and valid representation of the waterfall contained in the Information Memorandum. Any subsequent revisions of the waterfall program should be attested in the same manner. Similarly, RMBS templates reported for the first time, even if the RMBS has sufficient history, should carry such attestation. These attestations should be included in the Description_i sheets. The Reserve Bank of Australia reserves the right to review the attestation of the reported waterfall and deem the template invalid, with the subsequent implications for repo-eligibility, if in the Bank's sole judgement the attestation is inadequate.

7. What is not required to be reported?

The waterfall template does not require RMBS issuers to report projections of future cash flows from the collateral pool and how these projections are distributed by the cash flow waterfall to the RMBS liabilities. Investors will be able to use the template to this end, but it will be their responsibility to model the collateral pool cash flows (particularly, prepayment rates, defaults and losses-given-default).

Similarly, RMBS issuers are not required to report projections of exogenous factors, such as counterparty downgrades, that can affect the distribution of cash flows. However, all such exogenous factors should be allowed as user-specified inputs into the reported cash flow waterfall program and their effect should be accounted for within the reported cash flow waterfall program.

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Appendix A: Guide to Minimum Expected Inputs and Outputs of the Waterfall Program

This is a guide only to the minimum inputs and outputs of the waterfall program. Each RMBS is unique and the reported waterfall program should reflect accurately its features. Therefore, this is not an exhaustive list and is provided only as a guide.

Waterfall Inputs

- Dates – report date, collection start and end date, determination date, distribution date
- Accrual factor – number of days in accrual period as fraction of days-in-year as per relevant market conventions
- Collateral pool balances – initial, current performing, non-performing, charged off balances up to and including the determination date
- Collections – available income and available principal collected during the relevant collection period
- Interest rate applicable for the current period
- Currency exchange rate
- Opening balances on RMBS notes, liquidity facility, principal draws, redraw bonds for the current period
- Opening balance on excess spread account and other support accounts for the current period
- Scheduled principal repayments
- Arrears rate
- Triggers/conditions – sequential/pro-rata payment trigger/condition, clean-up trigger/condition, coupon step-up trigger, counterparty downgrades

Waterfall Outputs

- Senior fee payments
- Coupon Payments – coupon payment on each note according to the income waterfall
- Payment to excess spread account
- Residual income unit payment
- Chargeoffs reimbursements – reimbursements to previous chargeoffs made
- Chargeoffs – new principal charge offs on each note according to the losses waterfall
- Principal payments – principal payment on each note according to the principal waterfall
- Closing balances – RMBS notes, redraw bonds, liquidity facility, principal draw
- Cumulative chargeoffs
- Closing excess spread account balance
- Total RMBS liabilities
- Triggers/conditions – reported in their state after distributions are made

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Appendix B: Sample Waterfall Template

This Microsoft Excel sample is provided as a guide only to the layout and contents of the waterfall template. Each RMBS is unique and the reported waterfall should accurately reflect its features. Therefore, this is not an exhaustive implementation of the template and is provided as a guide only.

The sample Microsoft Excel file can be accessed at http://www.rba.gov.au/mkt-operations/xls/waterfall-template-for-repo-eligible-rmbs-sample.xlsm. A high level outline of the Visual Basic for Applications code included in the sample Microsoft Excel file is reproduced below:

```
'=====================================================================
' SAMPLE RMBS WATERFALL MODEL
' Author: Example Reporter
' Contact Information:  <Email address> <Telephone number>
' Date: <Date when template is effective from>
' Transaction ID: <Enter transaction ID>
' Master Trust Name: <Enter Master Trust Name>
' Series Trust Name: <Enter Series Trust Name>
' Purpose: To model the allocation of RMBS collateral pool cash flows to RMBS counterparties at each distribution date over the life of
the deal. The sample is provided only as a guide for the Reserve Bank of Australia Waterfall Reporting Template for Repo-Eligible
RMBS.
'  The detailed requirements for the template are available at http://www.rba.gov.au/mkt-operations/pdf/waterfall-template-for-repo-
eligible-rmbs.pdf. The waterfall program should comply with the requirements described in the waterfall template.
'=====================================================================

' Model Preamble: Initialize the VBA environment, ensuring that all variables are declared and that arrays are indexed starting with 1.

' <Enter command: This command or its equivalent implementation should be used to guarantee that all variables used in the waterfall
program are declared in advance>
Option Explicit

' <Enter command: This command or its equivalent should be used to guarantee that arrays are indexed with 1>
Option Base 1


Function Waterfall_1() As Variant
   ' The purpose of this function is to implement the waterfall according to the Information Memorandum for RMBS ISSUER PROGRAM
20XX-X
   ' The function should take as input all the variables specified as input variables in the Metadata sheet
   ' The function should return as output a single array containing the distributions to the RMBS notes and service providers, closing
balance on the RMBS notes, cumulative RMBS note chargeoffs and triggers following the distributions etc.
   ' Function version: 1
   ' Valid: xx April 2013

   ' FUNCTION PREAMBLE
   '
   ' Declare all variables used in the waterfall program
   ' <Enter commands>
   ' Declare the output array for storing the waterfall outputs
   ' <Enter commands>
   ' Declare intermediate variables such as RemainingAvailableIncome, RemainingAvailabelPrincipal, CouponPmtA, ...,
   ' PrincipalPmtA, ..., ChargeoffA, ..., ClosingChargeoffA, ..., ClosingBalanceA, ... etc.
   ' <Enter commands>
   Dim WaterfallOutput() As Variant


   ' INITIALISATION
   '
   ' Initialize all the local variables
   ' <Enter commands>
   ' The output array should be the same size as the waterfall outputs in the Metadata sheet
   ' In this sample of the waterfall template there are 45 output variables
   ' <Enter commands>
   ReDim WaterfallOutput(45)

   ' INTEREST WATERFALL
   '
   ' Distribute available income from the collateral pool to the payment of senior fees, coupons on the RMBS notes, and
   ' reinstating chargeoffs by applying the rules in the RMBS Information Memorandum to the inputs in the waterfall program
   ' for the current period. Follow sequential pay rules until trigger for pro-rata is reached etc.
   ' <Enter commands>
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```
' PRINCIPAL WATERFALL
'
' Distribute available principle  from the collateral pool to the payment of principal on the RMBS notes by applying the
' rules in the RMBS Information Memorandum to the inputs in the waterfall program for the current period.
' Follow sequential pay rules until trigger for pro-rata is reached etc.
' <Enter commands>


' CHARGEOFFS WATERFALL
'
' Distribute chargeoffs to the outstanding RMBS note balances according to the RMBS Information Memorandum
' <Enter commands>


' Populate the output array (WaterfallOutput) with the outputs of the waterfall
' <Enter commands>


'Return the output array (output)
Waterfall_1 = WaterfallOutput()


End Function
```