



Municipal Securities Rulemaking Board

Short-term Obligation Rate Transparency System

XML Interface Specification and Data Elements

Version 2.3
July, 2011

Revision History

Version	Date	Major Changes
1.0	December 10, 2008	Initial version.
1.1	December 16, 2008	Clarified descriptions of certain data elements in Section VI; added details of SHORT System Web Service in Section IX.
1.2	January 28, 2009	Changed address of the production web service and added address of testing web service for testing in Section IX; revised list of error codes in Section VII.
1.3	May 11, 2009	Clarified descriptions of the following data elements in Section VI: VRDO Date/Time of Interest Rate Reset, Par Amount Auctioned, Minimum Denomination, Liquidity Facility, Minimum Rate, and Maximum Rate; changed ARS/VRDO Indicator data element from modifiable to non-modifiable in Section VI; revised descriptions of error codes 2021 and TM04; deleted error code 2032; and added error codes TM29 and TM30 in Section VII
1.4	August 9, 2010 Changes Effective: September 27, 2010	Improved processing of submissions that contain transaction-level errors as described in Section VII.
2.0	December 2010	Version 2.0 reflecting changes to Rule G-34(c), described in MSRB Notice 2010-31. Changes primarily relate to data elements, including: deleting ARS Par Amount Auctioned and VRDO Par Amount Remarketed; adding VRDO Effective Date of Interest Rate, Aggregate Par Amount – Bank Bond, Aggregate Par Amount – Investors and Remarketing Agent, Identity of Tender Agent, and Identity of the Liquidity Provider; and, adding ARS Order Type, Order Interest Rate Order Entity Order Par Amount, and Filled Par Amount.
2.1	February 2011	Version 2.1 contains minor changes to Section X and revised list of error codes in Section VII Changes Effective May 16, 2011
2.2	April 2011	Schema updated to allow for a negative value in the VRDO field for aggregate par amount – investor and remarketing agent. Procedure clarified for reporting ARS “hold at any rate”

		or “deem hold” orders in Section VI.
2.3	July 2011	Schema minimum value allowed for AggregateParAmountInvestorRAType changed from 0 to -999999999. Added error codes TM51 and TM55. Data element matrix and description updated: Order Type, Order Interest Rate. Data element description update: Order Type, Aggregate Par Amount – Investors and Remarketing Agent

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I. Introduction

The purpose of this document is to assist submitters in creating properly formatted Extensible Markup Language (XML) files for upload to the Municipal Securities Rulemaking Board's (MSRB) Short-term Obligation Rate Transparency ("SHORT") System. Rule G-34(c) provides for the collection of information and documents about Auction Rate Securities ("ARS") and Variable Rate Demand Obligations ("VRDO"). The XML Interface is designed to permit users of the SHORT System to upload XML files that include all data identified in MSRB Rule G-34(c)(i)(A), on ARS Data, and (c)(ii)(A), on VRDO Data. Note, a separate interface is provided by the MSRB for uploading documents and related information as required under Rule G-34(c)(i)(B) and (c)(ii)(B). *See* the Specifications for the SHORT System Document Submission Service for computer-to-computer specifications for uploading documents. The MSRB also will publish a revised MSRB SHORT System Web User Interface Manual for manually uploading documents.

This document details the procedures for registering with the MSRB to submit information to the SHORT System. Also included in this document are schemas used by the SHORT System to parse XML file submissions. The schemas can be used by SHORT System submitters to verify that XML files are properly formatted. In addition, this document sets forth the data elements that will be used in connection with the XML Interface for the SHORT System.

The MSRB provides a SHORT System Web User Interface for manual input of data to the SHORT System. The SHORT System Web User Interface also displays information submitted by XML as well as any error codes returned on a submission. A separate user manual for the SHORT System Web User Interface is available on www.msrb.org.

Information submitted to the SHORT System is made available on the MSRB's Electronic Municipal Market Access ("EMMA") web portal and on a subscription basis.

Other Resources

MSRB Public Web Site: www.msrb.org

Rule G-34(c): www.msrb.org/Rules-and-Interpretations/MSRB-Rules/General/Rule-G-34.aspx

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II. SHORT System Overview

The SHORT System is a facility of the MSRB for the collection and dissemination of information and documents about securities bearing interest at short-term rates and making such information and documents publicly available through a dissemination service.

Submissions to the SHORT System

The SHORT System receives submissions of information and documents about securities bearing interest at short-term rates under MSRB Rule G-34(c).

Information and Documents to be Submitted. The basic items of information and documents required to be submitted to the SHORT System are the same as those required to be submitted to the MSRB under MSRB Rule G-34(c). Submitters of documents shall provide to the SHORT System related indexing information with respect to each document submitted, including an indication of the document type, date such document became available to the broker, dealer or municipal securities dealer, and CUSIP number(s) of the municipal securities to which such document relates. A submitter required to submit a document that is already available in its entirety in the SHORT System may, in lieu of submitting a duplicate document, identify the document already submitted and provide such items of related indexing information as are required by MSRB rules or the SHORT System input specifications and system procedures. A submitter required to submit a document that is not able to be obtained through best efforts as provided in Rule G-34(c) must provide an affirmative indication that a document required to be submitted is not available for submission notwithstanding the submitter's best efforts to obtain such document. The complete list of data elements that are required on a submission to the SHORT System is available in input specifications and system procedures made available on www.msrb.org. Submitters shall be responsible for the accuracy and completeness of all information submitted to the SHORT System.

Submitters. Submissions to the SHORT System may be made solely by authorized submitters using password-protected accounts in the MSRB's user authentication system, MSRB Gateway. Through MSRB Gateway, submitters also have the ability to designate third-party agents to submit information to the SHORT System on the submitter's behalf.

Submissions may be made by the following classes of submitters:

- ARS Program Dealer;
- VRDO Remarketing Agent;
- ARS Auction Agent; and

- Designated Agent, which may submit any information otherwise permitted to be submitted by another class of submitter which has designated such agent, as provided below.

Submitters may designate agents to submit information on their behalf, and may revoke the designation of any such agents, through MSRB Gateway. Such Designated Agents must register to obtain password-protected accounts through MSRB Gateway in order to make submissions on behalf of the designating submitters. All actions taken by a Designated Agent on behalf of a submitter that has designated such agent shall be the responsibility of the submitter.

The MSRB anticipates that a majority of ARS information will be submitted by ARS Auction Agents. ARS Auction Agents would be allowed to submit information to the SHORT System without prior designation by an ARS Program Dealer. In the event that an ARS Auction Agent submits information about an auction to the SHORT System, an ARS Program Dealer would not also be required to submit information provided that the ARS Program Dealer has been correctly identified on the submission by the ARS Auction Agent. In the event that an ARS Auction Agent fails to submit information about an ARS auction, the ARS Program Dealer would be required to submit the required information about the auction to the SHORT System

Timing of Submissions. Submitters are required to make submissions to the SHORT System within the timeframes set forth in MSRB Rule G-34(c) and related MSRB procedures. Submissions generally are required to be made by no later than 6:30 P.M. Eastern Time on the day that an auction occurs in an ARS or on the day that an interest rate reset occurs for a VRDO. Submissions of information to the SHORT System may be made throughout any RTRS Business Day, as defined in Rule G-14 RTRS Procedures, from at least the hours of 6:00 A.M. to 9:00 P.M. Eastern Time, subject to the right of the MSRB to make such processes unavailable at times as needed to ensure the integrity of the SHORT System and any related systems. Submissions of documents may be made throughout any day, subject to the right of the MSRB to make such processes unavailable between the hours of 3:00 A.M. and 6:00 A.M. each day, Eastern Time, for required maintenance, upgrades or other purposes, or at other times as needed to ensure the integrity of MSRB systems. The MSRB shall provide advance notice of any planned periods of unavailability and shall endeavor to provide information to submitters as to the status of the submission interface during unanticipated periods of unavailability, to the extent technically feasible.

Method of Submission. Information and documents may be submitted to the SHORT System through a secure, password-protected, web-based electronic submitter interface or through a secure, authenticated computer-to-computer data connection, at the election of the submitter. When making submissions using the web-based interface, related information is entered manually into an on-line form and documents are uploaded as portable document format (PDF) files. Computer-to-computer submissions utilize XML files for data and PDF files for documents. Appropriate schemas and procedures

for web-based and computer-to-computer submissions are available in input specifications and system procedures made available on www.msrb.org.

SHORT System Processing

The SHORT System provides a single portal for the submission of information and documents. The SHORT System, as well as other MSRB systems and services, performs various data checks to ensure that information and documents are submitted in the correct format. In addition, data checks are performed to monitor dealer compliance with MSRB Rule G-34(c) as well as to identify information submitted in correct formats that may contain errors due to information not falling within reasonable ranges of expected values for a given item of information. All submissions generate an acknowledgement or error message, and all dealers that have information or documents submitted on their behalf by either an ARS Auction Agent or a Designated Agent are able to monitor such submissions.

SHORT System Information and Document Dissemination

Information and documents submitted to the SHORT System that pass the format and data checks described above are processed and disseminated on a real-time basis. Any changes to submissions also are processed upon receipt and updated information and documents are disseminated in real-time. Information submitted to the SHORT System is, in general, disseminated to the EMMA short-term obligation rate transparency service within 15 minutes of acceptance, although during peak traffic periods dissemination may occur within one hour of acceptance. Submissions of documents to the SHORT System accepted during the hours of 8:30 A.M. to 6:00 P.M. Eastern Time on an MSRB business day are, in general, disseminated to the EMMA short-term obligation transparency service within 15 minutes of acceptance, although during peak traffic periods posting may occur within one hour of acceptance. Submissions outside of such hours often are posted within 15 minutes although some submissions outside of the MSRB's normal business hours may not be processed until the next business day. SHORT System information and documents, along with related indexing information, shall be made available to the public through the EMMA portal for the life of the related securities.

The MSRB plans to offer subscriptions to the information and documents submitted to the SHORT System in the future.

III. Normal System Hours

Submissions of information to the SHORT System may be made throughout any RTRS Business Day, as defined in Rule G-14 RTRS Procedures, from at least the hours of 6:00 A.M. to 9:00 P.M. Eastern Time, subject to the right of the MSRB to make such processes unavailable at times as needed to ensure the integrity of the SHORT System and any related systems. The MSRB shall provide advance notice of any planned periods of unavailability and shall endeavor to provide information to submitters as to the status of the submission interface during unanticipated periods of unavailability, to the extent technically feasible.

IV. SHORT System Registration

Submissions to the SHORT System may be made solely by authorized submitters using password-protected accounts in MSRB Gateway. Submitters of information to the SHORT System are required to obtain an account in MSRB Gateway in order to submit information to the SHORT System. Through MSRB Gateway, submitters also have the ability to designate third-party agents to submit information to the SHORT System on the submitter's behalf.

Submissions to the SHORT System may be made by the following classes of submitters:

- ARS Program Dealer;
- VRDO Remarketing Agent;
- ARS Auction Agent; and
- Designated Agent, which may submit any information otherwise permitted to be submitted by another class of submitter which has designated such agent.

User Account Management System

MSRB has assigned a master MSRB Gateway account to each dealer and each account is administered by the dealer's Primary Contact under MSRB Rule G-40, on electronic mail contacts. Each dealer controls the administration of its master account and is able to create and manage individual user accounts within MSRB Gateway. Dealers can also appoint account administrators to assist with managing user profiles and account access rights. Accounts in MSRB Gateway will be created by MSRB staff for each ARS Auction Agent.

Agent Invitation and Designation System

MSRB Gateway allows submitters to designate third-party agents to submit information to the SHORT System on their behalf. To designate an agent through MSRB Gateway, submitters send "invitations" to third-parties to act as Designated Agents. MSRB Gateway transmits these invitations by e-mail to the third parties, and upon receipt, the third party can create their own accounts in MSRB Gateway if they are not already registered users. These third parties can then accept submitter invitations through MSRB Gateway.

Submitters can also electronically confirm Designated Agents through MSRB Gateway before such Designated Agents begin making submissions to the SHORT System. Once confirmed by a submitter, a Designated Agent can log into MSRB Gateway to make electronic submissions on behalf of the designating submitter.

Submitters will be responsible in all respects for actions taken by Designated Agents on their behalf. MSRB Gateway will also allow submitters to revoke designations of Designated Agents at any time.

Please note that once a Designated Agent has been established as a recognized company in MSRB Gateway, the Designated Agent will utilize the User Account Management System as described above.

V. ARS Auction Agent and Program Dealer Submissions

ARS Auction Agents are allowed to submit information about an ARS to the SHORT System without prior designation by an ARS Program Dealer. In the event that an ARS Auction Agent submits information about an auction to the SHORT System, an ARS Program Dealer would not also be required to submit information provided that the ARS Program Dealer has been correctly identified on the submission by the ARS Auction Agent. In the event that an ARS Auction Agent fails to submit information about an ARS auction, the ARS Program Dealer is required to submit the required information about the auction to the SHORT System. Note that if there are multiple ARS Program Dealers associated with an auction for which an ARS Auction Agent fails to submit information about the auction to the SHORT System, ARS Program Dealers would only be allowed to report their own identity on an ARS submission unless another ARS Program Dealer has designated the submitting ARS Program Dealer to submit information to the SHORT System on its behalf through MSRB Gateway.

If there are more than one ARS Program Dealers associated with an auction and the ARS Auction Agent has not submitted the required information, the information about the ARS auction submitted by the first ARS Program Dealer to submit information to the SHORT System is disseminated. Upon receipt of additional submissions of information about the same ARS auction from other ARS Program Dealers, those dealers' identities would be added to the information about the ARS auction; however the other information required to be submitted will continue to reflect the information submitted by the first ARS Program Dealer to submit information. Submissions of information by an ARS Auction Agent supersede information submitted by another class of submitter, with the exception of the identities of ARS Program Dealers, even if an ARS Program Dealer has already submitted information about the ARS auction.

VI. Data Elements

This Section sets forth the data elements that will be used in connection with the XML interface for the SHORT System. The data elements are listed in tables that have the following columns. The order of the data elements in these tables does not necessarily represent the order of the fields in the XML-formatted file.

Column Name	Description
Field Name	English name of the data element
XML Tag	Name of the data element contained in the XML file
Required?	Indicates whether the data element is required for the submission to be processed
Values	Possible values for the data element, if applicable
Format	Data type and other structural information about the data element
Modifiable?	Indicates whether a data element may be changed after it has been submitted through a modification or whether the data element may only be changed through cancelling and resubmitting a new submission
Repeatable?	Indicates whether multiple values may be submitted for a data element
Length	Maximum size of a data element

All Data Elements

Field Name	XML Tag	Required?	Values	Format	Modifiable?	Repeatable?	Length
User ID	UserID	Y		Alpha Numeric	N	N	15
Password	Password	Y		Alpha Numeric	N	N	15
Submission Control Number	SubmissionCtrlNum	Y		Alpha Numeric	N	N	16
CUSIP	CUSIP9	Y		Alpha Numeric	N	Y	9
ARS/VRDO Indicator	InstrumentType	Y	A – ARS V - VRDO	Alpha	N	N	1
Transaction Type	TransactionType	Y	I – Instruct M – Modify C – Cancel	Alpha	N	N	1
Dealer MSRB Number	DealerMSRBNum	Y		Alpha Numeric	Y	Y (only ARS)	15
Date of Interest Rate Reset	Date	Y		Date – <i>yyyy-mm-dd</i>	N	N	8
Time of Interest Rate Reset	Time	Y		Time – <i>hh24:mi:ss</i>	Y	N	6
Date of Interest Rate Posting	Date	Y(ARS Only)		Date – <i>yyyy-mm-dd</i>	N	N	8
Time of Interest Rate Posting	Time	Y(ARS Only)		Time – <i>hh24:mi:ss</i>	Y	N	6
Length of the Interest Reset Period in Days	InterestRatePeriod	Y		Numeric	Y	N	3
Interest Rate	InterestRate	Y		Fixed Decimal (in percent) – <i>nn.nnn</i>	Y	N	5
Minimum Denomination	MinDenomination	Y		Numeric	Y	N	9
Rate Type	RateType	Y	ARS M – Max Rate H – All Hold Rate A – Set by Auction VRDO M – Max Rate F – Set by Formula R – Set by Agent	Alpha	Y	N	1

Field Name		Required?	Values	Format	Modifiable?	Repeatable	Length
Length of Notification Period in Days	NotificationPeriod	Y (VRDO Only)		Numeric	Y	N	3
Minimum Rate	MinRate	N*		Fixed Decimal (in percent) – <i>nn.nnn</i> (or “NC” if not calculable)	Y	N	5
Maximum Rate	MaxRate	N*		Fixed Decimal (in percent) – <i>nn.nnn</i> (or “NC” if not calculable)	Y	N	5
Liquidity Facility	LiquidityFacilityType	N*(VRDO Only)	P – Standby Bond Purchase Agreement L – Letter of Credit S – Self Liquidity	Alpha	Y	Y	1
Liquidity Facility Expiration Date	LiquidityFacilityExpirationDate	N (Y if Liquidity Facility = P, L or S; VRDO Only)		Date – <i>yyyy-mm-dd</i>	Y	Y	8
Effective Date of Interest Rate	EffectiveDateIR	Y (VRDO Only)		Date – <i>yyyy-mm-dd</i>	Y	N	8
Aggregate Par Amount – Bank Bond	AggregateParAmountBankBond	Y (VRDO Only)		Numeric	Y	N	10
Aggregate Par Amount – Investors and Remarketing Agent	AggregateParAmountInvestorRA	Y (VRDO Only)		Numeric	Y	N	10
Identity of Tender Agent	IdentityOfTenderAgent	Y (VRDO Only)		Alpha	Y	Y	90
Identity of the Liquidity Provider	IdentityOfLiquidityProvider	N (Y if Liquidity Facility = P, L or S; VRDO Only)		Alpha	Y	Y	90

* Note that null or blank is a valid value for these fields, thus these fields are “not required” for a submission to be processed by the SHORT System; however, Rule G-34 requires that these fields be populated with a value when a value applies. For example, if a maximum rate is specified in official documents for an ARS or VRDO, the maximum rate is required to be included in a submission.

Field Name		Required?	Values	Format	Modifiable?	Repeatable	Length
Order Type	OrderType	Y (N if Rate Type = H; ARS Only)	B – Buy Order O – Hold at Rate Order S – Sell Order	Alpha	Y	Y	1
Order Interest Rate	OrderInterestRate	Y (ARS Only; if Order Type = B or O; N if Order Type = S)		Fixed Decimal (in percent) – nn.nnn	Y	Y	5
Order Entity	OrderEntity	Y (if Order Type = B, O or S; ARS Only)	I – Investor P – Program Dealer C – Issuer/Conduit Borrower	Alpha	Y	Y	1
Order Par Amount	OrderParAmount	Y (if Order Type = B, O or S; ARS Only)		Numeric	Y	Y	10
Filled Par Amount	FilledParAmount	Y (if Order Type = B, O or S; ARS Only)		Numeric	Y	Y	10

ARS Data Elements Description

Field Name	Description
User ID	Submitter User ID in MSRB Gateway.
Password	Submitter password in MSRB Gateway.
Submission Control Number	Submitter assigned reference number.
CUSIP	CUSIP Number for the ARS
ARS/VRDO Indicator	Indication of whether a submission is an ARS or VRDO
Transaction Type	Indication of whether a submission is a new submission (I), a modification of an existing submission (M), or a cancellation of an existing submission (C)
Dealer MSRB Number	MSRB Registration Number of the ARS Program Dealer. Note that each ARS Program Dealer must be identified and an ARS Auction Agent may include the identities of any ARS Program Dealer without prior designated by an ARS Program Dealer. ARS Program Dealers would only be allowed to report their own identity on an ARS submission unless another ARS Program Dealer has designated the submitting ARS Program Dealer to submit information to the SHORT System.
Date of Interest Rate Reset	Date that the ARS auction occurred.
Time of Interest Rate Reset	Time that the ARS auction occurred. All reported times are Eastern Time and must be entered in military format. Note that seconds may be entered as "00" if your system is not capable of reporting seconds or if the seconds are not known.
Date of Interest Rate Posting	Date that the ARS auction results were communicated to ARS Program Dealers.
Time of Interest Rate Posting	Time that the ARS auction results were communicated to ARS Program Dealers. All reported times are Eastern Time and must be entered in military format. Note that seconds may be entered as "00" if your system is not capable of reporting seconds or if the seconds are not known.
Length of the Interest Reset Period in Days	Number of calendar days that the interest rate produced by the auction process is applicable.
Interest Rate	Interest rate, in percent, produced by the auction process.
Rate Type	Indication of whether the interest rate submitted represents a maximum rate (M), all hold rate (H), or an interest rate set by the auction process (A)
Minimum Denomination	Minimum allowable transaction size, in par amount, applicable on the day of the ARS auction.

Field Name	Description
Minimum Rate	Minimum interest rate, in percent, applicable at the time of the auction or if such minimum interest rate is not able to be calculated, an indication that such rate is not calculable (NC). Leave blank if there is no minimum rate applicable.
Maximum Rate	Maximum interest rate, in percent, applicable at the time of the auction or if such maximum interest rate is not able to be calculated, an indication that such rate is not calculable (NC). Leave blank if there is no maximum rate applicable.
Order Type	Indication of whether an order submitted is an order to buy (B), sell (S) or hold at rate (O).
Order Interest Rate	For orders to buy or hold at rate, the interest rate associated with such orders.
Order Entity	Indication of whether an order placed or that was filled is for an investor (I), program dealer for its own account (P) or issuer/conduit borrower of the ARS (C).
Order Par Amount	The aggregate par amount submitted to the auction for each order type, interest rate for buy and hold at rate orders, and order entity.
Filled Par Amount	The aggregate par amount filled as a result of the auction for each order type, interest rate for buy and hold at rate orders and order entity.

VRDO Data Elements Description

Field Name	Description
User ID	Submitter User ID in MSRB Gateway.
Password	Submitter password in MSRB Gateway.
Submission Control Number	Submitter assigned reference number.
CUSIP	CUSIP Number for the VRDO
ARS/VRDO Indicator	Indication of whether a submission is an ARS or VRDO
Transaction Type	Indication of whether a submission is a new submission (I), a modification of an existing submission (M), or a cancellation of an existing submission (C)
Dealer MSRB Number	MSRB Registration Number of the VRDO Remarketing Agent.
Date of Interest Rate Reset	Date that the VRDO interest rate was determined.
Time of Interest Rate Reset	Time that the VRDO interest rate reset was determined. All reported times are Eastern Time and must be entered in military format. Note that seconds may be entered as "00" if your system is not capable of reporting seconds or if the seconds are not known.
Length of the Interest Reset Period in Days	Number of calendar days that the interest rate produced by the interest rate reset is applicable.
Interest Rate	Interest rate, in percent, produced by the interest rate reset.
Effective Date of Interest Rate	Effective date that the interest rate reset is applicable
Minimum Denomination	Minimum allowable transaction size, in par amount, applicable on the day of the VRDO interest rate reset.
Rate Type	Indication of whether the interest rate submitted represents a maximum rate (M), a rate that was set by a formula (F), or a rate that was set by the VRDO Remarketing Agent (R)
Length of Notification Period in Days	Number of calendar days that may lapse between a holder of a VRDO tendering its security and a liquidity provider purchasing the tendered security in the event that the Remarketing Agent is unable to remarket the tendered security.
Minimum Rate	Minimum interest rate, in percent, applicable at the time of the interest rate or if such minimum interest rate is not able to be calculated, an indication that such rate is not calculable (NC). Leave blank if there is no minimum rate applicable.
Maximum Rate	Maximum interest rate, in percent, applicable at the time of the interest rate reset or if such maximum interest rate is not able to be calculated, an indication that such rate is not calculable (NC). Leave blank if there is no maximum rate applicable.

Field Name	Description
Liquidity Facility	For each liquidity facility applicable to the VRDO, an indication of whether each is a standby bond purchase agreement (P), letter of credit (L), or a “self liquidity” program whereby liquidity is provided by the issuer, conduit borrower or affiliate (S).
Identity of the Liquidity Provider	For each liquidity facility applicable to the VRDO, the identity of the liquidity provider. This value reflects information available to the VRDO Remarketing Agent as of the date and time of the interest rate reset.
Liquidity Facility Expiration Date	The expiration date of each liquidity facility applicable to the VRDO.
Identity of Tender Agent	For each tender agent applicable to the VRDO, the identity of the tender agent. This value reflects information available to the VRDO Remarketing Agent as of the date and time of the interest rate reset.
Aggregate Par Amount – Bank Bond	Par amount of the VRDO, if any, held by liquidity providers (as a “Bank Bond”). This value reflects information available to the VRDO Remarketing Agent as of the date and time of the interest rate reset.
Aggregate Par Amount – Investors and Remarketing Agent	Par amount of the VRDO, if any, held by parties other than a liquidity provider, which represents the aggregate par amounts held by the VRDO Remarketing Agent and by investors. This value reflects information available to the VRDO Remarketing Agent as of the date and time of the interest rate reset.

VII. SHORT System Error Codes

The SHORT System performs various data checks to ensure that information submitted is in the correct format. In addition, data checks are performed to monitor compliance with MSRB Rule G-34(c) as well as to identify information submitted in correct formats that may contain errors due to information not falling within reasonable ranges of expected values for a given item of information. Note that the data checks performed are subject to change.

Format Edits

Each submission, which may contain more than one “transaction” representing, for example, a report of a VRDO interest rate reset, is reviewed by the SHORT System to verify that its format as well as the format of each transaction is correct. This involves checking various required data elements to ensure that they are present in the correct form (e.g., dates are in date format) and with the correct number of digits or characters. Submissions that fail these edits are not processed further and must be resubmitted in the correct format in order for the submission to be processed by the SHORT System. Transactions receiving a format edit error code also must be resubmitted in the correct format in order for the transactions to be processed by the SHORT System. Beginning September 27, 2010, for submissions containing multiple transactions, the SHORT System will accept all transactions that do not receive a format error code and only those transactions receiving a format error must be resubmitted in the correct format

The SHORT System only accepts information from parties known to the MSRB. In addition, information submitted by a Designated Agent on behalf of a dealer or ARS Auction Agent will only be accepted if such dealer or ARS Auction Agent for whom the Designated Agent is submitting information has previously been so designated by the dealer or ARS Auction Agent. Submissions by parties that are not known to the MSRB or by a party for whom a dealer or ARS Auction Agent has not designated as a Designated Agent receive a format edit error code and such information must be resubmitted by a party known to the MSRB or by a Designated Agent.

Content Edits

The values in submissions of data to the SHORT System that pass all format edits are checked to determine that they are within reasonable limits. Transactions receiving a content edit error code must be reviewed to check that the information was correctly reported. If the information was correctly reported, no further action is required; however, any erroneous information must be corrected by either modifying the information or cancelling and resubmitting a correct report. Corrections must be made as soon as possible.

Error Code Tables

Listed below are all of the error codes that could be returned in response to a submission to the SHORT System. For each error code, a short description is provided as well as an indication of whether each error code applies to instruct, modification or cancellation as well as whether each error code applies to a report of an ARS or VRDO.

Submission-Level Edits

Error Code	Description	Instruct	Modify	Cancel	ARS	VRDO
E001	No Transaction(s) found	Y	Y	Y	Y	Y
E002	Message received is either Unparseable or has validation errors in Submitter/Subscriber data	Y	Y	Y	Y	Y
E003	One or more transactions in the message have failed	Y	Y	Y	Y	Y
E004	Authentication Error	Y	Y	Y	Y	Y
E006	System Down	Y	Y	Y	Y	Y
E007	System busy processing other request/query - retry	Y	Y	Y	Y	Y
E008	ProcessorEngine failed to complete processing the message	Y	Y	Y	Y	Y
E009	Unsupported Mode	Y	Y	Y	Y	Y
E010	Missing Submission Control Number	Y	Y	Y	Y	Y
E011	Invalid Submission Control Number	Y	Y	Y	Y	Y
E012	Missing Information Type	Y	Y	Y	Y	Y
E013	Unsupported Information Type	Y	Y	Y	Y	Y
E014	Missing Message Timestamp	Y	Y	Y	Y	Y
E015	Invalid Message Timestamp	Y	Y	Y	Y	Y
E101	Zero Transaction(s) Processed	Y	Y	Y	Y	Y
S101	Transaction(s) Included	Y	Y	Y	Y	Y

Transaction-Level Edits

Format Edits

Error Code	Description	Instruct	Modify	Cancel	ARS	VRDO
S001	Submitted Transaction(s) Successfully Processed	Y	Y	Y	Y	Y
1001	Submitter does not have privileges to submit to SHORT System	Y	Y	Y	Y	Y
1003	Submitter does not have permissions for MSRB ID	Y	Y	Y	Y	Y
2001	UNSAT CUSIP check digit missing or incorrect	Y	Y	Y	Y	Y
2002	Missing ARS/VRDO Indicator	Y	Y	Y	Y	Y
2003	Invalid ARS/VRDO Indicator - not A or V	Y	Y	Y	Y	Y
2004	Missing Transaction Type	Y	Y	Y	Y	Y
2005	Invalid Transaction Type – not I, M or C	Y	Y	Y	Y	Y
2006	Missing Dealer MSRB Number	Y	Y	Y	Y	Y
2007	Invalid Dealer MSRB Number	Y	Y	Y	Y	Y
2008	Missing Date of Interest Rate Reset	Y	Y	Y	Y	Y
2009	Date of Interest Rate Reset not in correct format – yyyy-mm-dd	Y	Y	Y	Y	Y
2010	Missing Time of Interest Rate Reset	Y	Y	Y	Y	Y
2011	Time of Interest Rate Reset not in correct format – hh24:mi:ss	Y	Y	Y	Y	Y
2013	Missing Date of Interest Rate Posting	Y	Y	Y	Y	
2014	Date of Interest Rate Posting not in correct format – yyyy-mm-dd	Y	Y	Y	Y	
2015	Missing Time of Interest Rate Posting	Y	Y	Y	Y	
2016	Time of Interest Rate Posting not in correct format – hh24:mi:ss	Y	Y	Y	Y	
2018	Missing Length of Interest Rate Reset Period	Y	Y	Y	Y	Y
2019	Length of Interest Rate Reset Period is non-numeric	Y	Y	Y	Y	Y
2020	Missing Interest Rate	Y	Y	Y	Y	Y
2021	Interest Rate not in correct format - nn.nnn or outside of min/max rates	Y	Y	Y	Y	Y
2022	Missing Minimum Denomination	Y	Y	Y	Y	Y
2023	Minimum Denomination is non-numeric	Y	Y	Y	Y	Y
2024	Missing Rate Type	Y	Y	Y	Y	Y
2025	Invalid Rate Type - not M, H or A for ARS or not M, F or R for VRDO	Y	Y	Y	Y	Y

Error Code	Description	Instruct	Modify	Cancel	ARS	VRDO
2028	Missing Length of Notification Period for VRDO	Y	Y	Y		Y
2029	Length of Notification Period is non numeric	Y	Y	Y		Y
2033	Maximum Rate not in correct format – nn.nnn or NC	Y	Y	Y	Y	Y
2034	Missing Liquidity Facility for VRDO	Y	Y	Y		Y
2035	Invalid Liquidity Facility – not P or L	Y	Y	Y		Y
2036	Missing Liquidity Facility Expiration Date for VRDO	Y	Y	Y		Y
2037	Liquidity Facility Expiration Date not in correct format – yyyy-mm-dd	Y	Y	Y		Y
2040	Minimum Rate not in correct format - nn.nnn	Y	Y	Y	Y	Y
2041	Missing Minimum Rate	Y	Y	Y	Y	Y
TM01	Invalid Dealer MSRB Number Format	Y	Y	Y	Y	Y
TM02	Par Amount is out of range	Y	Y		Y	
TM03	Notification Period is out of range	Y	Y			Y
TM04	Maximum Rate is missing or out of range	Y	Y		Y	Y
TM05	Liquidity Facility Expiration Date is out of range	Y	Y			Y
TM31	Effective Date IR not in correct format – yyyy-mm-dd	Y	Y	Y		Y
TM32	Missing Effective Date IR	Y	Y	Y		Y
TM33	Missing Aggregate Par Amount Bank Bond	Y	Y	Y		Y
TM34	Missing Aggregate Par Amount Investors and Remarketing Agent	Y	Y	Y		Y
TM35	Missing Identity Of Tender Agent	Y	Y	Y		Y
TM36	Missing Identity Of Liquidity Provider	Y	Y	Y		Y
TM37	Missing Order Type	Y	Y	Y	Y	
TM38	Missing Order Interest Rate	Y	Y	Y	Y	
TM39	Missing Order Entity	Y	Y	Y	Y	
TM40	Missing Order Par Amount	Y	Y	Y	Y	
TM41	Missing Filled Par Amount	Y	Y	Y	Y	
TM42	Aggregate Par Amount Bank Bond must be numeric and within range	Y	Y	Y		Y
TM43	Aggregate Par Amount Investors and Remarketing Agent must be numeric and within range	Y	Y	Y		Y
TM44	Order Interest Rate not in correct format - nn.nnn	Y	Y	Y	Y	
TM45	Order Par Amount must be numeric and within range	Y	Y	Y	Y	
TM46	Filled Par Amount must be numeric and within range	Y	Y	Y	Y	
TM47	Invalid Order Type - must be B, O, or S	Y	Y	Y	Y	
TM48	Invalid Order Entity - must be I, P, or C	Y	Y	Y	Y	

Error Code	Description	Instruct	Modify	Cancel	ARS	VRDO
TM49	Value missing or Maximum field length exceeded	Y	Y	Y	Y	
TM50	Effective Date not greater than or equal to Reset Date	Y	Y	Y		Y
TM51	Effective Date Interest Rate not in correct format – yyyy-mm-dd	Y				Y

Content Edits

Error Code	Description	Instruct	Modify	Cancel	ARS	VRDO
3001	Date/Time of Interest Rate Reset in future	Y	Y	Y	Y	Y
3002	Date/Time of Interest Rate Posting in future	Y	Y	Y	Y	
4001	Submission of Message exceeds time allowed	Y	Y	Y	Y	Y
5001	Modification does not have matching instruct		Y		Y	Y
5002	Cancel does not have matching instruct			Y	Y	Y
6001	ARS Program Dealer submission where information has already been submitted by another submitter (in this case only the submitting Dealer MSRB Number is added to list of dealers already identified, if necessary)	Y			Y	
TM13	Duplicate Transaction Data within same message	Y	Y	Y	Y	Y
TM23	Submissions in the future are not allowed	Y	Y		Y	Y
TM27	VRDO submissions are not allowed	Y	Y	Y		Y
TM29	Rate Period must be greater than 0	Y	Y	Y	Y	Y
TM30	Liquidity Facility Expire Date cannot be in the past	Y	Y	Y		Y
TM55	Reset Date is greater than last reset date plus reset period. Please ensure that you did not miss sending SHORT a Reset	Y			Y	Y

VIII. SHORT System Submission Feedback

All submissions processed by the SHORT System generate an acknowledgement or error message. Each transaction within a submission also receives an acknowledgement or error message. In addition, all dealers that have information submitted on their behalf by either an ARS Auction Agent or a Designated Agent will be able to monitor such submissions in real-time, once such submissions have passed all format edits processed by the SHORT System.

Feedback Delivery

All submissions and transactions within a submission to the SHORT System are assigned an acknowledgement or error code. Such information is available by the following means:

Electronic Feedback. All submitters that submit information to the SHORT System using XML receive a response message by XML. (See section XII for the Submitter Response XML schema.)

SHORT System Web User Interface. All submitters, as well as any party for whom information has been submitted on its behalf, may view submissions and any error codes returned using the SHORT System Web User Interface. A separate user manual for the SHORT System Web User Interface is available on www.msrb.org.

IX. SHORT System Web Service

Submissions of information to the SHORT System using a computer-to-computer connection are made by transmitting a properly formatted XML file to the SHORT System Web Service.

Separate web services are used for submitting information to the SHORT System pursuant to Rule G-34 (“SHORT System Production Environment”) or for making test submissions (“SHORT System Test Environment”). The web services are at the following locations:

SHORT System Production Environment:
https://short.msrb.org/msrb_avts_ws/services/avts_submitter_services?wsdl

SHORT System Test Environment:
https://shorttest.msrb.org/msrb_avts_ws/services/avts_submitter_services?wsdl

Submissions of information to the SHORT System using the Web Service to satisfy the requirements of Rule G-34 must be made using the SHORT System Production Environment web service.

X. XML MESSAGE SCHEMAS

Detailed below are SubmitterInput, SubmitterQuery, SubmitterResponse and Common input schemas.

SubmitterInput.xsd

```
<?xml version="1.0" encoding="utf-8"?>
<xsd:schema elementFormDefault="qualified"
  xmlns:avts="http://www.msrb.org/avts/common"
  xmlns="http://www.msrb.org/avts/submitter"
  targetNamespace="http://www.msrb.org/avts/submitter"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:import namespace="http://www.msrb.org/avts/common"
    schemaLocation="Common.xsd" />

  <xsd:element name="SubmitterInput">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="Submitter" type="MSRBSubmitter" />
        <xsd:element name="Transactions" type="Transactions" />
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:complexType name="MSRBSubmitter">
    <xsd:complexContent>
      <xsd:extension base="avts:Submitter">
        <xsd:sequence>
          <xsd:element ref="avts:Password" />
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
```

```
<xsd:element name="Dealers">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element minOccurs="1" maxOccurs="unbounded"
        ref="avts:DealerMSRBNum" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="InterestRate" type="avts:Rate" />

<xsd:simpleType name="RateTypeNC">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="avts:Rate" />
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="NC" />
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="MinDenomination">
  <xsd:restriction base="xsd:decimal">
    <xsd:minInclusive value="0"/>
    <xsd:totalDigits value="9" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="InterestRatePeriod">
  <xsd:restriction base="avts:Period" />
</xsd:simpleType>

<xsd:simpleType name="NotificationPeriod">
```

```
<xsd:restriction base="avts:Period" />
</xsd:simpleType>

<xsd:complexType name="InterestRatePostingDateTime">
  <xsd:complexContent>
    <xsd:extension base="avts:BasicDateTime" />
  </xsd:complexContent>
</xsd:complexType>

<xsd:simpleType name="ParAmountAuctioned">
  <xsd:restriction base="xsd:decimal">
    <xsd:minInclusive value="0" />
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="ParAmountRemarketed">
  <xsd:restriction base="xsd:decimal">
    <xsd:minInclusive value="0" />
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Transactions">
  <xsd:sequence>
    <xsd:element minOccurs="1" maxOccurs="unbounded"
      name="Transaction" type="Transaction" />
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Transaction">
  <xsd:sequence>
    <xsd:element name="TransactionType"
      type="avts:TransactionType" />
    <xsd:element name="Instrument" type="avts:Instrument" />
    <xsd:element ref="Dealers" />
    <xsd:element ref="RateInformation" />
  </xsd:sequence>
</xsd:complexType>
```

```

        <xsd:element ref="Orders" minOccurs="0" maxOccurs="1" />
    </xsd:sequence>
</xsd:complexType>

<xsd:element name="LiquidityFacilityExpireDate"
    type="avts:BasicDate" />

<xsd:element name="TenderAgent">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name="IdentityOfTenderAgent"
                type="avts:IdentityOfTenderAgentType" />
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="Order">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name="OrderType" type="avts:OrderType" minOccurs="0" maxOccurs="1" />
            <xsd:element name="OrderInterestRate" type="avts:Rate" minOccurs="0" maxOccurs="1"/>
            <xsd:element name="OrderEntity" type="avts:OrderEntity" />
            <xsd:element name="OrderParAmount" type="avts:OrderParAmountType" />
            <xsd:element name="FilledParAmount" type="avts:FilledParAmountType" />
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="LiquidityFacility">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name="LiquidityFacilityType"
                type="avts:LiquidityFacilityType" />
            <xsd:element ref="LiquidityFacilityExpireDate" />
            <xsd:element name="IdentityOfLiquidityProvider" type="avts:IdentityOfLiquidityProviderType" minOccurs="0"
maxOccurs="1"/>
        </xsd:sequence>

```



```
        </xsd:complexType>
    </xsd:element>
    <xsd:element name="LiquidityFacilities">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element minOccurs="0" maxOccurs="unbounded"
                    ref="LiquidityFacility" />
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

    <xsd:element name="Orders">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element minOccurs="0" maxOccurs="unbounded"
                    ref="Order" />
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

    <xsd:element name="TenderAgents">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element minOccurs="1" maxOccurs="unbounded"
                    ref="TenderAgent" />
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

    <xsd:element name="RateInformation">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element name="InterestRateResetDateTime"
                    type="avts:InterestRateResetDateTime" />
                <xsd:element name="InterestRatePeriod"
                    type="InterestRatePeriod" />
                <xsd:choice>
```

```

        <xsd:element name="NotificationPeriod" type="NotificationPeriod" />
        <xsd:element name="InterestRatePostingDateTime"
            type="InterestRatePostingDateTime" />
    </xsd:choice>
    <xsd:element ref="InterestRate" />
    <xsd:element name="EffectiveDateIR" type="avts:BasicDate" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="AggregateParAmountBankBond" type="avts:AggregateParAmountBankBondType" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="AggregateParAmountInvestorRA" type="avts:AggregateParAmountInvestorRAType" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="MinDenomination" type="MinDenomination"/>
        <xsd:element name="RateType" type="avts:RateType" />
        <xsd:element minOccurs="0" maxOccurs="1"
            name="ParAmountAuctioned" type="ParAmountAuctioned"/>
        <xsd:element minOccurs="0" maxOccurs="1"
            name="ParAmountRemarketed" type="ParAmountRemarketed"/>
        <xsd:element minOccurs="0" maxOccurs="1" name="MinRate"
            type="RateTypeNC" />
        <xsd:element minOccurs="0" maxOccurs="1" name="MaxRate"
            type="RateTypeNC" />
        <xsd:element minOccurs="0" maxOccurs="1"
            ref="LiquidityFacilities" />
        <xsd:element minOccurs="0" maxOccurs="1" ref="TenderAgents" />
    </xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:schema>

```

SubmitterQuery.xsd

```
<xsd:schema elementFormDefault="qualified"
  xmlns="http://www.msrb.org/avts/submitter_query"
  xmlns:avts="http://www.msrb.org/avts/common"
  targetNamespace="http://www.msrb.org/avts/submitter_query"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:submitter="http://www.msrb.org/avts/submitter">

  <xsd:import namespace="http://www.msrb.org/avts/common"
    schemaLocation="Common.xsd"/>

  <xsd:import namespace="http://www.msrb.org/avts/submitter"
    schemaLocation="SubmitterInput.xsd" />

  <xsd:element name="SubmitterQuery">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="Submitter" type="submitter:MSRBSubmitter"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

</xsd:schema>
```

SubmitterResponse.xsd

```
<xsd:schema xmlns="http://www.msrb.org/avts/submitter_response"
  xmlns:avts="http://www.msrb.org/avts/common"
  xmlns:submitter="http://www.msrb.org/avts/submitter"
  elementFormDefault="qualified"
  targetNamespace="http://www.msrb.org/avts/submitter_response"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:import namespace="http://www.msrb.org/avts/common"
```

```
        schemaLocation="Common.xsd" />
<xsd:import namespace="http://www.msrb.org/avts/submitter"
  schemaLocation="SubmitterInput.xsd" />

<xsd:element name="SubmitterDetails" type="avts:Submitter" />

<xsd:element name="SubmitterMessage">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="SubmitterDetails" />
      <xsd:element ref="SubmittedTransactions" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="SubmitterResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="ResponseMessageHeader" type="avts:ResponseMessageHeader"/>
      <xsd:element ref="SubmitterMessage" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element name="SubmittedTransactions">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="Status" type="avts:Results" />
      <xsd:element minOccurs="1" maxOccurs="unbounded"
        ref="SubmittedTransaction" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="SubmittedTransaction">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="TransactionType"
        type="avts:TransactionType" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

```
<xsd:element name="Instrument" type="avts:Instrument" />
  <xsd:element name="InterestRateResetDateTime"
    type="avts:InterestRateResetDateTime" />
  <xsd:element name="Results" type="avts:Results"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:schema>
```

Common.xsd

```
<xsd:schema elementFormDefault="qualified"
  targetNamespace="http://www.msrb.org/avts/common"
  xmlns="http://www.msrb.org/avts/common"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:jaxb="http://java.sun.com/xml/ns/jaxb"
  xmlns:xjc="http://java.sun.com/xml/ns/jaxb/xjc"
  jaxb:extensionBindingPrefixes="xjc" jaxb:version="1.0">

  <xsd:annotation>
    <xsd:appinfo>
      <jaxb:globalBindings>
        <xjc:serializable />
      </jaxb:globalBindings>
    </xsd:appinfo>
  </xsd:annotation>

  <xsd:element name="DealerMSRBNum">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:pattern value="[a-zA-Z0-9]*" />
        <xsd:minLength value="5" />
        <xsd:maxLength value="15" />
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:element>

  <xsd:element name="DealerMSRBName">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:pattern value="[a-zA-Z0-9,.;:]*" />
        <xsd:minLength value="5" />
        <xsd:maxLength value="90" />
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:element>
```

```
<xsd:complexType name="AVTSUser">
  <xsd:sequence>
    <xsd:element name="UserID" type="UserID" />
    <xsd:element ref="Password" />
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="UserID">
  <xsd:restriction base="xsd:string">
    <xsd:minLength value="3" />
    <xsd:maxLength value="15" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="Period">
  <xsd:restriction base="xsd:integer">
    <xsd:minInclusive value="0" />
    <xsd:maxInclusive value="999" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="Rate">
  <xsd:restriction base="xsd:decimal">
    <xsd:pattern value="[0-9]{1,2}\.[0-9]{1,3}" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:element name="Password">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:minLength value="8" />
      <xsd:maxLength value="50" />
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

```
<xsd:simpleType name="SubmissionCtrlNum">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="[a-zA-Z0-9]{16}" />
    <xsd:minLength value="16" />
    <xsd:maxLength value="16" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="AVTSCtrlNum">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="[a-zA-Z0-9]{16}" />
    <xsd:minLength value="16" />
    <xsd:maxLength value="16" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="InformationType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="ResetRate/Liquidity" />
    <xsd:enumeration value="Bidding" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="InstrumentType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="A" />
    <xsd:enumeration value="V" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:element name="CUSIP9">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:pattern value="[a-zA-Z0-9]{9}" />
      <xsd:minLength value="9" />
      <xsd:maxLength value="9" />
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```



```
        </xsd:simpleType>
    </xsd:element>

    <xsd:complexType name="Instrument">
        <xsd:sequence>
            <xsd:element ref="CUSIP9" />
            <xsd:element name="InstrumentType" type="InstrumentType" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:simpleType name="BasicTime">
        <xsd:restriction base="xsd:string">
            <xsd:pattern
                value="(0[0-9]|[1-5][0-9]):(0[0-9]|[1-5][0-9]):(0[0-9]|[1-5][0-9])" />
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:simpleType name="BasicDate">
        <xsd:restriction base="xsd:string">
            <xsd:pattern
                value="(19|20)\d\d-(0[1-9]|1[012])-(0[1-9]|[12][0-9]|3[01])" />
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:complexType name="BasicDateTime">
        <xsd:sequence>
            <xsd:annotation>
                <xsd:documentation>
                    All Dates will be in EST. Date and Time fields have
                    been broken up into components so that Timezone is
                    not used.
                </xsd:documentation>
            </xsd:annotation>
            <xsd:element name="Date" type="BasicDate" />
            <xsd:element name="Time" type="BasicTime" />
        </xsd:sequence>
    </xsd:complexType>
```

```
<xsd:complexType name="InterestRateResetDateTime">
  <xsd:complexContent>
    <xsd:extension base="BasicDateTime" />
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="MessageTimeStamp">
  <xsd:complexContent>
    <xsd:extension base="BasicDateTime" />
  </xsd:complexContent>
</xsd:complexType>

<xsd:simpleType name="TransactionType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="I" />
    <xsd:enumeration value="M" />
    <xsd:enumeration value="C" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Submitter">
  <xsd:sequence>
    <xsd:element name="UserID" type="UserID" />
    <xsd:element name="SubmitterMessageTimeStamp"
      type="MessageTimeStamp" />
    <xsd:element name="SubmissionCtrlNum"
      type="SubmissionCtrlNum" />
    <xsd:element name="InformationType" type="InformationType" />
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="FromSeqNum">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="[0-9]{16}" />
    <xsd:minLength value="16" />
    <xsd:maxLength value="16" />
  </xsd:restriction>
</xsd:simpleType>
```

```
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:complexType name="Subscriber">
        <xsd:sequence>
            <xsd:element name="UserID" type="UserID" />
            <xsd:element name="SubscriberMessageTimeStamp"
                type="MessageTimeStamp" />
            <xsd:element name="InformationType" type="InformationType" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="Results">
        <xsd:sequence>
            <xsd:element minOccurs="1" maxOccurs="unbounded"
                name="Result" type="Result" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="Result">
        <xsd:sequence>
            <xsd:element name="ResultCode">
                <xsd:simpleType>
                    <xsd:restriction base="xsd:string">
                        <xsd:pattern value="[0-9,A-Z]{4}" />
                        <xsd:minLength value="4" />
                        <xsd:maxLength value="4" />
                    </xsd:restriction>
                </xsd:simpleType>
            </xsd:element>
            <xsd:element name="ResultMessage" type="xsd:string" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:simpleType name="MessageID">
        <xsd:restriction base="xsd:string">
            <xsd:pattern value="[0-9]{10}" />
        </xsd:restriction>
    </xsd:simpleType>
```

```
        <xsd:minLength value="10" />
        <xsd:maxLength value="10" />
    </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="ResponseMessageHeader">
    <xsd:sequence>
        <xsd:element name="ResponseMessageID" type="MessageID" />
        <xsd:element name="ResponseMessageTimeStamp"
            type="BasicDateTime" />
    </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="RateType">
    <xsd:annotation>
        <xsd:documentation>
            ARS M – Max Rate H – All Hold Rate A – Set by Auction
            VRDO M – Max Rate F – Set by Formula R – Set by Agent
        </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="M" />
        <xsd:enumeration value="H" />
        <xsd:enumeration value="A" />
        <xsd:enumeration value="F" />
        <xsd:enumeration value="R" />
    </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="LiquidityFacilityType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="P" />
        <xsd:enumeration value="L" />
        <xsd:enumeration value="S" />
    </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:simpleType name="AggregateParAmountBankBondType">
  <xsd:restriction base="xsd:decimal">
    <xsd:pattern value="[0-9]*" />
    <xsd:minInclusive value="0"/>
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="AggregateParAmountInvestorRAType">
  <xsd:restriction base="xsd:decimal">
    <xsd:minInclusive value="-999999999"/>
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="IdentityOfLiquidityProviderType">
  <xsd:restriction base="xsd:string">
    <xsd:minLength value="1" />
    <xsd:maxLength value="90" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="IdentityOfTenderAgentType">
  <xsd:restriction base="xsd:string">
    <xsd:minLength value="1" />
    <xsd:maxLength value="90" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="OrderType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="B" />
    <xsd:enumeration value="O" />
    <xsd:enumeration value="S" />
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:simpleType name="OrderEntity">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="I" />
    <xsd:enumeration value="P" />
    <xsd:enumeration value="C" />
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:simpleType name="OrderParAmountType">
  <xsd:restriction base="xsd:decimal">
    <xsd:pattern value="[0-9]*" />
    <xsd:minInclusive value="0"/>
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:simpleType name="FilledParAmountType">
  <xsd:restriction base="xsd:decimal">
    <xsd:pattern value="[0-9]*" />
    <xsd:minInclusive value="0"/>
    <xsd:totalDigits value="10" />
  </xsd:restriction>
</xsd:simpleType>
```

```
</xsd:schema>
```

XI. Sample Submitter Input XML

```
<?xml version="1.0" ?>
<SubmitterInput xmlns="http://www.msrb.org/avts/submitter"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:avts="http://www.msrb.org/avts/common"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xsi:schemaLocation="http://www.msrb.org/avts/submitter SubmitterInput.xsd
  http://www.msrb.org/avts/common Common.xsd">

  <Submitter>
    <avts:UserID>bthomps01234567</avts:UserID>
    <avts:SubmitterMessageTimeStamp>
      <avts>Date>2008-08-22</avts>Date>
      <avts:Time>15:00:00</avts:Time>
    </avts:SubmitterMessageTimeStamp>
    <avts:SubmissionCtrlNum>2008082200000001</avts:SubmissionCtrlNum>
    <avts:InformationType>ResetRate/Liquidity</avts:InformationType>
    <avts>Password>password0123456</avts>Password>
  </Submitter>
  <Transactions>
    <Transaction>
      <TransactionType>I</TransactionType>
      <Instrument>
        <avts:CUSIP9>123456AB1</avts:CUSIP9>
        <avts:InstrumentType>V</avts:InstrumentType>
      </Instrument>
      <Dealers>
        <avts:DealerMSRBNum>A1234</avts:DealerMSRBNum>
      </Dealers>
      <RateInformation>
        <InterestRateResetDateTime>
          <avts>Date>2008-09-22</avts>Date>
          <avts:Time>12:00:00</avts:Time>
        </InterestRateResetDateTime>
        <InterestRatePeriod>7</InterestRatePeriod>
      </RateInformation>
    </Transaction>
  </Transactions>
</SubmitterInput>
```

```

    <NotificationPeriod>7</NotificationPeriod>
    <InterestRate>4.250</InterestRate>
    <MinDenomination>100000</MinDenomination>
    <RateType>F</RateType>
    <ParAmountRemarketed>45000000</ParAmountRemarketed>
    <MinRate>03.500</MinRate>
    <MaxRate>06.500</MaxRate>
    <LiquidityFacilities>
      <LiquidityFacility>
        <LiquidityFacilityType>P</LiquidityFacilityType>
        <LiquidityFacilityExpireDate>2008-12-01</LiquidityFacilityExpireDate>
      </LiquidityFacility>
      <LiquidityFacility>
        <LiquidityFacilityType>L</LiquidityFacilityType>
        <LiquidityFacilityExpireDate>2009-01-31</LiquidityFacilityExpireDate>
      </LiquidityFacility>
    </LiquidityFacilities>
  </RateInformation>
</Transaction>
<Transaction>
  <TransactionType>M</TransactionType>
  <Instrument>
    <avts:CUSIP9>987654ZX2</avts:CUSIP9>
    <avts:InstrumentType>V</avts:InstrumentType>
  </Instrument>
  <Dealers>
    <avts:DealerMSRBNum>B2345</avts:DealerMSRBNum>
  </Dealers>
  <RateInformation>
    <InterestRateResetDateTime>
      <avts:Date>2008-09-22</avts:Date>
      <avts:Time>15:30:00</avts:Time>
    </InterestRateResetDateTime>
    <InterestRatePeriod>7</InterestRatePeriod>
    <NotificationPeriod>7</NotificationPeriod>
    <InterestRate>05.325</InterestRate>
    <MinDenomination>100000</MinDenomination>

```



```

    <RateType>R</RateType>
    <ParAmountRemarketed>45000000</ParAmountRemarketed>
    <MinRate>NC</MinRate>
    <MaxRate>NC</MaxRate>
    <LiquidityFacilities>
      <LiquidityFacility>
        <LiquidityFacilityType>L</LiquidityFacilityType>
        <LiquidityFacilityExpireDate>2008-12-31</LiquidityFacilityExpireDate>
      </LiquidityFacility>
    </LiquidityFacilities>
  </RateInformation>
</Transaction>
<Transaction>
  <TransactionType>I</TransactionType>
  <Instrument>
    <avts:CUSIP9>656565BB3</avts:CUSIP9>
    <avts:InstrumentType>A</avts:InstrumentType>
  </Instrument>
  <Dealers>
    <avts:DealerMSRBNum>A3456</avts:DealerMSRBNum>
    <avts:DealerMSRBNum>A5245</avts:DealerMSRBNum>
  </Dealers>
  <RateInformation>
    <InterestRateResetDateTime>
      <avts>Date>2008-09-22</avts>Date>
      <avts:Time>12:00:00</avts:Time>
    </InterestRateResetDateTime>
    <InterestRatePeriod>7</InterestRatePeriod>
    <InterestRatePostingDateTime>
      <avts>Date>2008-09-22</avts>Date>
      <avts:Time>14:00:00</avts:Time>
    </InterestRatePostingDateTime>
    <InterestRate>05.330</InterestRate>
    <MinDenomination>100000</MinDenomination>
    <RateType>A</RateType>
    <ParAmountAuctioned>45000000</ParAmountAuctioned>
  </RateInformation>

```

```
        </Transaction>
    </Transactions>
</SubmitterInput>
```

XII. Sample Submitter Query XML

```
<?xml version="1.0" encoding="utf-8"?>
<SubmitterQuery xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="http://www.msrb.org/avts/submitter_query"
  xmlns:avts="http://www.msrb.org/avts/common"
  xmlns:submitter="http://www.msrb.org/avts/submitter"
  xsi:schemaLocation="http://www.msrb.org/avts/submitter_query SubmitterQuery.xsd
  http://www.msrb.org/avts/common Common.xsd http://www.msrb.org/avts/submitter SubmitterInput.xsd">

  <Submitter>
    <avts:UserID>bthomps</avts:UserID>
    <avts:SubmitterMessageTimeStamp>
      <avts>Date>2008-08-22</avts>Date>
      <avts:Time>15:00:00</avts:Time>
    </avts:SubmitterMessageTimeStamp>
    <avts:SubmissionCtrlNum>2008082200000001</avts:SubmissionCtrlNum>
    <avts:InformationType>ResetRate/Liquidity</avts:InformationType>
    <avts>Password>password</avts>Password>
  </Submitter>

</SubmitterQuery>
```

XIII. Sample Submitter Response XML

```
<?xml version="1.0" encoding="utf-8"?>
<SubmitterResponse xmlns="http://www.msrb.org/avts/submitter_response"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:avts="http://www.msrb.org/avts/common"
  xsi:schemaLocation="http://www.msrb.org/avts/submitter_response
    SubmitterResponse.xsd">

  <ResponseMessageHeader>
    <avts:ResponseMessageID>1234567890</avts:ResponseMessageID>
    <avts:ResponseMessageTimeStamp>
      <avts>Date>2008-09-22</avts>Date>
      <avts:Time>12:00:00</avts:Time>
    </avts:ResponseMessageTimeStamp>
  </ResponseMessageHeader>

  <SubmitterMessage>
    <SubmitterDetails>
      <avts:UserID>bthomps0</avts:UserID>
      <avts:SubmitterMessageTimeStamp>
        <avts>Date>2008-09-22</avts>Date>
        <avts:Time>12:00:00</avts:Time>
      </avts:SubmitterMessageTimeStamp>
      <avts:SubmissionCtrlNum>2008082200000001</avts:SubmissionCtrlNum>
      <avts:InformationType>ResetRate/Liquidity</avts:InformationType>
    </SubmitterDetails>
    <SubmittedTransactions>
      <Status>
        <avts:Result>
          <avts:ResultCode>S001</avts:ResultCode>
          <avts:ResultMessage>
            Success: SubmitterResponse Successful
          </avts:ResultMessage>
        </avts:Result>
      </avts:Result>
    </SubmittedTransactions>
  </SubmitterMessage>
</SubmitterResponse>
```

```
<avts:ResultCode>S002</avts:ResultCode>
<avts:ResultMessage>
  Success: 3 Transaction(s) Processed Successfully
</avts:ResultMessage>
</avts:Result>
</Status>
<SubmittedTransaction>
  <TransactionType>M</TransactionType>
  <Instrument>
    <avts:CUSIP9>987654ZX2</avts:CUSIP9>
    <avts:InstrumentType>V</avts:InstrumentType>
  </Instrument>
  <InterestRateResetDateTime>
    <avts:Date>2008-09-22</avts:Date>
    <avts:Time>12:00:00</avts:Time>
  </InterestRateResetDateTime>
  <Results>
    <avts:Result>
      <avts:ResultCode>S001</avts:ResultCode>
      <avts:ResultMessage>
        Success: SubmittedTransaction Successful
      </avts:ResultMessage>
    </avts:Result>
  </Results>
</SubmittedTransaction>
<SubmittedTransaction>
  <TransactionType>I</TransactionType>
  <Instrument>
    <avts:CUSIP9>12345XYZ1</avts:CUSIP9>
    <avts:InstrumentType>V</avts:InstrumentType>
  </Instrument>
  <InterestRateResetDateTime>
    <avts:Date>2008-09-22</avts:Date>
    <avts:Time>12:00:00</avts:Time>
  </InterestRateResetDateTime>
  <Results>
    <avts:Result>
```

```

        <avts:ResultCode>E001</avts:ResultCode>
        <avts:ResultMessage>
            Error: SubmittedTransaction Failed - Invalid
            CUSIP
        </avts:ResultMessage>
    </avts:Result>
    <avts:Result>
        <avts:ResultCode>E037</avts:ResultCode>
        <avts:ResultMessage>
            Error: SubmittedTransaction Failed - Invalid
            Security Type
        </avts:ResultMessage>
    </avts:Result>
</Results>
</SubmittedTransaction>
<SubmittedTransaction>
    <TransactionType>C</TransactionType>
    <Instrument>
        <avts:CUSIP9>987654ZX2</avts:CUSIP9>
        <avts:InstrumentType>V</avts:InstrumentType>
    </Instrument>
    <InterestRateResetDateTime>
        <avts>Date>2008-09-22</avts>Date>
        <avts:Time>12:00:00</avts:Time>
    </InterestRateResetDateTime>
    <Results>
        <avts:Result>
            <avts:ResultCode>S001</avts:ResultCode>
            <avts:ResultMessage>
                Success: SubmittedTransaction Successful
            </avts:ResultMessage>
        </avts:Result>
    </Results>
</SubmittedTransaction>
</SubmittedTransactions>
</SubmitterMessage>
</SubmitterResponse>
```