

**Halifax Regional Municipality**

**Electronic Voting System – 2008 Advanced Polling**

**Specified Procedures Report**

**October 24, 2008**

**Private & Confidential**

**Note** – This report is confidential and is intended solely for the use of the Returning Officer, Halifax Regional Municipality. It should not be provided to any other party without our prior written consent. Our report has not considered issues relevant to third parties and we shall have no responsibility whatsoever to any third party which obtains a copy of this report. Any use such a third party may choose to make of this report is entirely at its own risk.

**REPORT ON RESULTS OF APPLYING SPECIFIED PROCEDURES ON THE ELECTRONIC VOTING SYSTEM USED DURING THE ADVANCED POLLING PERIOD FOR THE 2008 HALIFAX REGIONAL MUNICIPALITY MUNICIPAL AND SCHOOL BOARD ELECTIONS**

To the Returning Officer  
**Halifax Regional Municipality**

As specifically agreed, we have performed the procedures detailed in Appendix A (the "Specified Procedures") in connection with the electronic voting system used during the advanced polling period for the 2008 Halifax Regional Municipality ("HRM") Municipal and School Board elections.

The results of applying the Specified Procedures are set out in Appendix A. The Specified Procedures performed do not constitute an audit or review engagement and, accordingly, no assurance is expressed. Had we performed additional procedures or an audit or review engagement, other matters might have come to our attention that would have been reported. The sufficiency and appropriateness of the Specified Procedures described in this report are solely the responsibility of the Returning Officer. Consequently, we make no representation regarding questions of legal interpretation or regarding the sufficiency and adequacy of the Specified Procedures described in Appendix A, either for the purpose for which this report has been requested, or for any other purposes.

This report is intended solely for the purpose of assisting the Returning Officer in evaluating the electronic voting system used in the 2008 HRM Municipal and School Board elections during the advanced polling period. Any use that a third party makes of our report, and any reliance or decisions made based on it, are the responsibility of such third party. We accept no responsibility for any loss or damages suffered by any third party as a result of decisions made or actions taken based on our report.

*Ernst & Young LLP*

Halifax, Canada  
October 24, 2008

Chartered Accountants

## Overview

### Background

HRM engaged a third party (“Intelivote”) to support the electronic voting during the advanced polling period of the 2008 Municipal and School Board elections. Ernst & Young have been engaged by HRM to perform Specified Procedures before, during and after the electronic voting portion of the advance polling period.

HRM’s internal Business Systems and Control group conducted activities independent of Ernst & Young including, but not limited to, the areas of security, risk analysis and other internal audit activities. Ernst & Young did not review or participate in those activities, nor are the results of those procedures integrated into our report.

Electronic voting was available during the advance polling period beginning at 8:00am on October 4, 2008 and ending at 8:00pm on October 6, 2008.

### Definition of terms used in this report

For ease of reading, certain terms, acronyms and abbreviations are used within the body of the report. These are explained below:

- **Electronic voting** - Voting via telephone or using a computer.
- **PIN** - Personal Identification Number. Can be either a legitimate voter PIN or, as specified, a Test PIN for the performance of Specified Procedures.
- **Test Account** - An account that is directly allocated to testers who perform Specified Procedures and which can only access the test module.
- **Public Channel** - A system interface which the general public used to log onto the system.
- **Internet system** - Refers to a component of the electronic voting system used to support computer-based voting.
- **IVR (Interactive Voice Response) system** - Refers to a component of the electronic voting system used to support telephone-based voting.
- **Rogue Status** - Indicates when a PIN is suspended.

Data files used in executing Specified Procedures

HRM and Intelivote provided the following data files from their information systems to support certain Specified Procedures.

Organization	File Name	File Contents	As Referenced in the Appendix A Specified Procedures
HRM	HRMExtract.txt	The HRM voter information recorded in the HRM system	HRM data extract
	Final list of voters.pdf	The final list of voters supplied to the manual polling stations that detailed voters who were struck off and those who were eligible to vote.	Final list of Voters
Intelivote	N001_HRM_20080923.txt	The HRM voter information in Intelivote's database	Intelivote data extract
	Fall 2008-HRM.txt	The final list of PINs generated for the purposes of the 2008 HRM election	Extract of PINs
	Pre-election voting activity.pdf	Report that indicating voting activity recorded prior to the advanced polling	Pre-election voting activity report
	HRM.tar.gpg	Encrypted version of the detailed voting results	Election Close File

We relied on HRM and Intelivote to provide us with complete, accurate and reliable data files, as described above, on which we performed the Specified Procedures. We did not verify the completeness, accuracy or integrity of this data against any independent source other than as described in the Specified Procedures.

**Appendix A - Specified Procedures in connection with the electronic voting systems used during the advanced polling period for the 2008 HRM Municipal and School Board elections and the results of the Specified Procedures**

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
1	<p>Sub-Procedure A - Inspect the confirmation from the mail out Vendor.</p> <p>Compare the confirmed total number of envelopes mailed to the recorded number of HRM voters in the HRM data extract.</p> <p>Sub-Procedure B - Enquire with the HRM to obtain their representation regarding the record count difference.</p>	<p>Sub-Procedure A - The total number of confirmed envelopes mailed was 279,324.</p> <p>The total number of records in the HRM data extract was 279,326.</p> <p>Sub-Procedure B - Obtained representation from the HRM that the difference was due to 2 deceased voters that remained in the HRM data extract, but were purposefully removed from the mail out.</p>	X							

<sup>1</sup> Note - Electronic voting was available between 8:00am October 4, 2008 and 8:00pm October 6, 2008. The "Before" period is defined as the period between September 22, 2008 and the start of the electronic advanced voting period. The "After" period is defined as the period between the end of the electronic advanced voting period and October 21, 2008. The Specified Procedures were carried out at various times during these periods as indicated on the table and the Results apply only to the particular time(s) indicated.

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
2	Observe that all 23 Test Account PINS were included in the mail out and note the date the mail was received.	<p>23 Test Account PINS were included in the mail out.</p> <p>23 Test Account PINS were received by selected Ernst &amp; Young personnel at their residence by mail between September 26<sup>th</sup> 2008 and September 30<sup>th</sup> 2008 prior to the advanced polling period.</p>	X							
3	<p>Obtain the HRM data extract and the Intelivote data extract.</p> <p>Sub-Procedure A - Compare the total number of records, Name, Address, Date of Birth and District fields for all records in the 2 data extracts.</p>	<p>Sub-Procedure A - The total number of records in the HRM data extract was 279,326.</p> <p>The total number of records in the Intelivote data extract was 279,328.</p> <p>3 common records contained different first names between the HRM and Intelivote data extracts.</p> <p>No other exceptions were identified with Name, Address, Date of Birth, and District fields for the records in the 2 data extracts.</p>	X							

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
	Sub-Procedure B - Enquire with the HRM as to the reason there were 2 additional records in the Intelivote data extract.	Sub-Procedure B - Obtained representation from the HRM that the difference was due to 2 newly enumerated voters that were added to the Intelivote information system after the original data transfer to Intelivote from HRM.								
4	Using the HRM data extract noted in Procedure 3, randomly select a sample of 25 records and visually compare on screen that the Name, Address, Date of Birth, and District is consistent with data in the HRM information system.	Name, Address, Date of Birth and District were consistent between the HRM data extract and the HRM information system for the sample of 25 records selected.	X							
5	Using the HRM data extract noted in Procedure 3, compare the total number of records in the data extract and visually compare on screen to the total number of records in the HRM information system.	The total number of records in the HRM data extract was 279,326.  The total number of records noted in the HRM information system was 279,326.	X							

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
6	<p>Using the HRM data extract noted in Procedure 3, calculate the potential number of duplicate records by performing the following:</p> <p>Sub-Procedure A - Calculate the number of records with the identical full last name, full first name and date of birth.</p> <p>Sub-Procedure B - Calculate the number of records with the identical full last name, first initial of the first name and date of birth.</p> <p>Sub-Procedure C - Calculate the number of records with the identical main address and date of birth.</p> <p>Sub-Procedure D - Combine the results of Sub-Procedures A, B and C and calculate the number of unique records.</p>	<p>Sub-Procedure A: 227 records were identified with an identical full last name, full first name and date of birth.</p> <p>Sub-Procedure B: 1,844 records were identified with identical full last name, first initial of the first name and date of birth.</p> <p>Sub-Procedure C: 2,291 records were identified with identical main address and date of birth.</p> <p>Sub-Procedure D: 3,867 unique records were identified.</p>	X							
7	<p>Obtain an extract of PINS generated from the Intelivote information system. Using the ACL software "Look For Duplicates" function, identify whether duplicate PINS exist in the data extract.</p>	<p>There were no duplicate PINS noted.</p>	X							

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
8	Obtain a listing of all system users who can access the electronic voting system (application, operating system and database).  Obtain representation from the HRM Project Manager (application) and Intelivote System Representative (database and operating system) that those listed users are appropriate.	Representation from the HRM Project Manager and Intelivote System Representative indicated that all listed system users of the electronic voting system were appropriate.	X							
9	Using a Test Account, log onto the electronic voting system via telephone to attempt to cast votes prior to the advance polling period.	Access to the electronic voting system was granted and test votes were cast and recorded as test votes.	X							
10	Public Channel: Attempt to log onto the electronic voting system via telephone to attempt to cast votes prior to the advance polling period.	Access to the electronic voting system was denied.	X							
11	Using a Test Account, log onto the electronic voting system via Internet to attempt to cast votes prior to the advance polling period.	Access to the electronic voting system was granted and test votes were cast and recorded as test votes.	X							
12	Public Channel: Attempt to log onto the electronic voting system via Internet to attempt to cast votes prior to the advance polling period.	Access to the electronic voting system was denied.	X							

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
13	<p>Obtain a listing of all non-acclaimed candidates, and their districts, from HRM. Using Test Accounts:</p> <p>Sub-Procedure A - Visually inspect that all candidate names are set up in the Internet system and are assigned to the correct district.</p> <p>Sub-Procedure B - Listen and validate that the candidate names are audible/ set up in the IVR system and are assigned to the correct district.</p>	All candidates were set up and assigned to the districts defined by HRM in the Internet and IVR systems.	X							
14	Attempt to log onto the IVR and Internet system with a PIN that is set to Rogue status.	Access to the voting system was denied.	X	X	X	X	X	X	X	X
15	Obtain the pre-election voting activity report from the Intelivote information system, and observe whether there are any non-test votes recorded. The timing of this procedure is to occur between 7:55am and 7:59am on October 4, 2008 (prior to the advance polling period start time).	No non-test votes were observed in the pre-election voting activity report as at October 4, 2008, 7:58am.		X						

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After	
			Before	04/10/08		05/10/08		06/10/08		
				AM	PM	AM	PM	AM		PM
16	At HRM Elections Central, observe that an alarm system has been installed and is enabled for the building or the area where election support terminals are housed.	An alarm system has been installed and is enabled.		X						
17	Visit HRM Elections Central four times during the electronic advanced polling period, observe instances of people entering or exiting the premises and validate that only authorized people with HRM identification are allowed to enter and that visitors are escorted upon entering and are required to log time in and out.	<p>Obtained a list of authorized individuals from HRM.</p> <p>Observed that authorized individuals wearing HRM identification entered HRM Elections Central.</p> <p>Observed that a log book was present for the signing in and out of escorted visitors. During the time of our visits, no visitors were noted entering or exiting the premises. Inspected the log book and noted 2 Instances where individuals did not sign in; however, there was a corresponding sign out. 8 Instances were noted where individuals were no longer on the premises and there was no corresponding sign out.</p>			X	X	X			X

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After	
			Before	04/10/08		05/10/08		06/10/08		
				AM	PM	AM	PM	AM		PM
18	Obtain a list of all personnel with access to HRM Elections Central. Obtain representation from HRM Project Manager that those users are authorized and their access levels are appropriate.	13 individuals are authorized HRM employees who have access to the Elections Central. Representation was obtained from the HRM Project Manager, who indicated that all were authorized and access levels were appropriate.		X						
19	Using Test Accounts, cast a vote for each non-acclaimed candidate using the IVR system. Observe that a vote could be cast for each non-acclaimed candidate.	Test votes were successfully cast for each non-acclaimed candidate using the IVR system.		X	X	X	X	X	X	
20	Using Test Accounts, cast a vote for each non-acclaimed candidate using the Internet system. Observe that a vote could be cast for each non-acclaimed candidate.	Test votes were successfully cast for each non-acclaimed candidate using the Internet system.		X	X	X	X	X	X	
21	Using a Test Account that has already been used to cast a vote, observe whether additional votes can be cast and recorded in the IVR system.  Sub-Procedure A: Attempt to vote for the same candidate as the original vote.  Sub-Procedure B: Attempt to vote for a different candidate in the same race.	Sub-Procedure A: Unable to log onto the IVR system.  Sub-Procedure B: Unable to log onto the IVR system.		X	X	X	X	X	X	

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
22	<p>Using a Test Account that has already been used to cast a vote, observe whether additional votes can be cast and recorded in the electronic voting system via the Internet system.</p> <p>Sub-Procedure A: Attempt to vote to the same candidate as the original vote.</p> <p>Sub-Procedure B: Attempt to vote for a different candidate in the same race.</p>	<p>Sub-Procedure A: Unable to log on to the Internet system.</p> <p>Sub-Procedure B: Unable to log on to the Internet system.</p>		X	X	X	X	X	X	
23	Using a telephone that was already used to complete an electronic voting session, conduct two additional complete electronic voting sessions from the same telephone using unused voter credentials. Observe whether the IVR system will record the votes from three unique Test Accounts using the same device.	The IVR system recorded the test votes from three unique voters using the same device.		X	X	X	X	X	X	

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After	
			Before	04/10/08		05/10/08		06/10/08		
				AM	PM	AM	PM	AM		PM
24	Using a computer that was already used to cast a complete electronic voting session, conduct two additional complete electronic voting sessions from the same computer using unused voter credentials. Observe whether the Internet system will record the electronic votes from three unique Test Accounts using the same device.	The Internet system recorded the test votes from three unique voters using the same device.		X	X	X	X	X	X	
25	<p>Sub-Procedure A: Using a Test Account, complete an electronic voting session by voting in all eligible races using the Internet system.</p> <p>Sub-Procedure B: Using the same Test Account, attempt to use the IVR system to conduct an additional complete electronic voting session by voting for the same candidates as voted for using the Internet system. Observe whether additional votes can be cast for those candidates.</p>	<p>Sub-Procedure A: Voting successful.</p> <p>Sub-Procedure B: Unable to log on to the IVR system to cast a vote using the same Test Account that was voted in Sub-Procedure A.</p>		X	X	X	X	X	X	

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After	
			Before	04/10/08		05/10/08		06/10/08		
				AM	PM	AM	PM	AM		PM
26	<p>Sub-Procedure A: Using a Test Account, complete an electronic voting session by voting in all eligible races using the IVR system.</p> <p>Sub-Procedure B: Using the same Test Account, attempt to use the Internet system to conduct an additional complete electronic voting session by voting for the same candidates as voted for using the IVR system. Observe whether additional votes can be cast for those candidates.</p>	<p>Sub-Procedure A: Voting successful.</p> <p>Sub-Procedure B: Unable to log on to the Internet system to cast a vote using the same Test Account that was voted in Sub-Procedure A.</p>		X	X	X	X	X	X	
27	<p>Using a Test Account and the IVR system, vote for the Mayor and obtain confirmation of that vote.</p> <p>Disconnect from the IVR system by hanging up. Using the same physical telephone, log onto the IVR system using the same credentials and observe whether the Test Account is able to vote for the eligible District Councillor and school district races.</p>	<p>The Test Account was able to successfully log onto the IVR system and continue to register votes for the eligible District Councillor and school district races.</p>		X	X	X	X	X	X	

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
28	Using a Test Account and the Internet system, vote for the Mayor and obtain confirmation of that vote.  Disconnect from the Internet system by severing the computer connection. Using the same physical computer, log onto the Internet system using the same credentials and observe whether the Test Account is able to vote for the eligible District Councillor and school district races.	The Test Account was able to successfully log on and continue to register votes for the eligible District Councillor and school district races.		X	X	X	X	X	X	
29	Using a Test Account, begin an IVR system voting session. Keep the session active. Using a different physical telephone, attempt to log onto the IVR system using the same set of credentials and observe whether the system will allow the log on.	The second log on attempt was unsuccessful.		X	X	X	X	X	X	
30	Using a Test Account, begin an Internet system voting session. Keep the session active. Using a different physical computer, attempt to log onto the Internet system using the same set of credentials and observe whether the system will allow the log on.	The second log on attempt was unsuccessful.		X	X	X	X	X	X	

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>							
			Before	04/10/08		05/10/08		06/10/08		After
				AM	PM	AM	PM	AM	PM	
31	Using a Test Account, begin an Internet system voting session and attempt to select multiple candidates for a given race. Observe whether the system will allow multiple candidates to be selected.	No more than one single candidate could be selected for a given race.		X	X	X	X	X	X	
32	Public Channel: Attempt to log onto the IVR system to attempt to cast votes after the electronic advance polling period has ended.	Unable to log onto the IVR system.								X
33	Public Channel: Attempt to log onto the Internet system to attempt to cast votes after the electronic advance polling period has ended.	Unable to log onto the Internet system.								X
34	After the electronic advance polling period is closed, observe that the Vault containing electronic advance polling results is locked.	The vault containing the electronic advance polling election results was locked.								X

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After	
			Before	04/10/08		05/10/08		06/10/08		
				AM	PM	AM	PM	AM		PM
35	<p>At the close of the electronic advance polling period, observe the following:</p> <p>Sub-Procedure A: Intelivote creating the Election Close File containing the electronic advanced polling results. This file is to be encrypted and burned to two compact discs. The encryption password is to be created by the HRM Returning Officer.</p> <p>Obtain one copy and observe that the other copy has been provided to the HRM Returning Officer.</p> <p>Sub-Procedure B: Intelivote creating a printed report of the electronic advanced polling results, placing it in a sealed envelope and providing it to the HRM Returning Officer.</p>	<p>Sub-Procedure A: Observed that Intelivote created an encrypted Election Close File containing the electronic advanced polling results.</p> <p>We observed that the file was encrypted using encryption software. The HRM Returning Officer created an encryption password. The encrypted file was burned to two compact discs. One was provided to Ernst &amp; Young. The other compact disc was provided to the HRM Returning Officer.</p> <p>Sub-Procedure B: Observed that Intelivote created a printed report of the electronic advance polling results and provided this to the HRM Returning Officer who placed the report in an envelope, which was then sealed.</p>								X

#	Specified Procedures	Results	Timing and Occurrence of Specified Procedures <sup>1</sup>						After		
			Before	04/10/08		05/10/08		06/10/08			
				AM	PM	AM	PM	AM		PM	
36	<p>Obtain the password from the HRM Returning Officer to open the Election Close File received in Procedure 35.</p> <p>Calculate the final results of the electronic advanced polling period and compare the results to the printed report received in Procedure 35, Sub-Procedure B.</p>	<p>Obtained the password from the HRM Returning Officer and opened the Election Close File.</p> <p>Calculated the final results of the electronic advanced polling period and compared those results to the results on the printed results received in Procedure 35, Sub-Procedure B.</p> <p>The vote count for each candidate was identical.</p>								X	
37	Using the Election Close File received in Procedure 35, observe whether all Test Account voting activity has been eliminated from the final electronic advanced polling results.	Observed that all Test Account voting activity had been eliminated from the final electronic advanced polling results.									X
38	Select a sample of 5 voters who were known to have voted using the electronic voting system. Observe that they are listed as having voted on the final list of voters and their voting selection should not be disclosed.	<p>Selected a sample of 5 voters who were known to have voted using the electronic voting system.</p> <p>Observed that each voter was indicated as having voted on the voters list and their voting preferences were not disclosed.</p>									X