

2009 PRE-ENUMERATION  
VOTERS LIST QUALITY  
MEASUREMENT

March 2009 - Report

ELECTIONS BC



BCStats



## EXECUTIVE SUMMARY

---

This report presents the findings of the 2009 Pre-Enumeration Voters List Quality Measurement for Elections BC. The purpose of the study is to assess the overall quality of the BC Voters List, including an analysis of both its coverage and currency.

### **Coverage proportion was 91.2%**

List coverage was determined to be 91.2%, based upon a January 13, 2009 demarcation date. This measure was calculated by comparing the number of registered voters to the estimated population of eligible voters.

### **Currency proportion, with imputation of non-responses, was 81.9% ( $\pm 1.2\%$ )**

Using the multiple imputation statistical approach, responses were imputed for each of the non-responses, providing a higher level of certainty about their disposition. The findings from the imputation, taken together with the confirmed responses, provided a currency estimate of 81.9% ( $\pm 1.2\%$ , 19 times out of 20)<sup>1</sup>. This measure represents an increase in overall list currency, as compared to the estimates taken from the July 2008 Voters List Quality Measure. However, as the definition of currency has changed from the July 2008 survey to the January 2009 survey, caution should be exercised in directly comparing both measures.

### **Overall list quality was 75.2% ( $\pm 1.2\%$ )**

A measure of overall list quality was obtained by multiplying the coverage proportion by the currency proportion. The result of this calculation provided a list quality estimate of 75.2% ( $\pm 1.2\%$ , 19 times out of 20). This measure indicates that 75.2% of eligible voters are both listed on the Elections BC Voters List and their voter information is correct.

---

<sup>1</sup> Refers to a 95% confidence interval.

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... II**

**INTRODUCTION..... 1**

**RESULTS ..... 2**

    COVERAGE ESTIMATE..... 2

    CURRENCY ESTIMATE..... 3

    QUALITY ESTIMATE..... 10

    STACKED ADDRESS ANALYSIS..... 12

**APPENDIX I: ESTIMATING ELIGIBLE VOTER POPULATION..... 13**

    PROVINCIAL..... 13

    SUB-PROVINCIAL BY AGE AND SEX..... 14

**APPENDIX II: CURRENCY AUDIT – METHODOLOGY ..... 16**

    PHONE SOURCING ..... 16

    SURVEY DESIGN ..... 17

    SAMPLE DESIGN..... 18

    SURVEY ADMINISTRATION..... 22

    DECISION RULES..... 23

    MISSING DATA..... 24

**APPENDIX III: TELEPHONE SURVEY SCRIPT (STANDARD)..... 26**

**APPENDIX IV: TELEPHONE SURVEY SCRIPT (STACKED ADDRESS) ..... 31**

**APPENDIX V: MAIL SURVEY FORM (STANDARD) ..... 36**

**APPENDIX VI: MAIL SURVEY FORM (STACKED ADDRESS)..... 39**

**APPENDIX VII: INTRODUCTORY LETTER..... 42**

**APPENDIX VIII: PHONE SOURCING METHODOLOGY ..... 43**



---

## INTRODUCTION

---

This report presents the findings of the 2009 Pre-Enumeration Voters List Quality Measurement conducted by BC Stats on behalf of Elections BC. The purpose of the research is to assess the quality of the BC Voters List, both in terms of its currency and its coverage.

By measuring list quality (and its constituent proportions of currency and coverage), it is possible to assess the overall status of the voters list at a given point in time. This provides insight as to the general comprehensiveness and accuracy of information found within Elections BC's database. Additionally, currency, coverage and quality estimates provide a basis for longitudinal analyses; which in turn offer indicators of effectiveness for list improvement activities.

For the currency estimate, three survey instruments were designed to solicit responses from a sample of 5,000 individuals on the voters list: a telephone survey, web survey and mail survey. Each survey asked respondents to verify three details in the BC Voters List, specifically the voter's name, date of birth and home address. If a voter indicated their information on the BC Voters List was incorrect, additional questions were presented to the respondent in order to collect a voter's most accurate and current information. Survey administration took place over a four and half week period beginning January 26 and ending February 27, 2009.

### Report Outline

The remainder of this report includes the following sections:

- RESULTS: findings from the coverage, currency and quality estimate calculations
- APPENDIX I: methodology used to create the coverage estimate
- APPENDIX II: details regarding the sourcing of phone numbers, survey design, sample selection and stratification, survey administration and the proxy decision rules and imputation of missing data
- APPENDIX III: a copy of the standard phone survey script
- APPENDIX IV: a copy of the stacked address phone survey script
- APPENDIX V: a copy of the standard mail survey form
- APPENDIX VI: a copy of the stacked address survey form
- APPENDIX VII: a copy of the introductory letter
- APPENDIX VIII: a methodology on phone matching, provided by the vendor responsible for phone sourcing

## RESULTS

---

### COVERAGE ESTIMATE

The coverage estimate was generated using January 13, 2009 as the demarcation date. The population of registered voters in the Elections BC database as of this date was compared to the estimated population of eligible BC voters as determined by BC Stats Population Statistics section. The estimated population of eligible voters was also produced with a reference date of January 13, 2009. For a discussion of the methodology used to create the estimate, please refer to Appendix I.

The population of registered voters was: 2,955,853<sup>2</sup>

The estimated population of eligible voters was: 3,218,480

The calculation of coverage is:

$$\frac{\text{Registered Voters}}{\text{Estimated Eligible Voters}} = \text{Coverage (\%)}$$
$$\frac{2,955,853}{3,218,480} = 91.8\%$$

---

<sup>2</sup> This population differs from that used in the currency estimate as it represents all registered voters. The population for the currency estimate however, contains only those registered voters who had been allocated to a specific electoral district, lived at an address not identified as either “frozen” or “retired” in the BC Voters List, or had not been sampled to participate in the July 2008 survey.

## CURRENCY ESTIMATE

Estimates of currency were based on a population of 2,949,388 registered voters. This population represents only those voters whose record was associated with one of the 85 Provincial Electoral Districts (PED) or whose address was not identified as being either “frozen” or “retired” in the Elections BC Voters List. Additionally, voters who were selected to participate in the July 2008 survey were also excluded from the January 2009 survey’s sample population. In total 6,465 registered voters who were not allocated to the one of the 85 PED’s, had a “frozen” or “retired” address or had been sampled in the July 2008 survey, were not included in the sampling plan for this study.

## Confirmed Response Findings

The list quality study provided two sets of findings: confirmed findings and imputed findings. The confirmed findings represent only the data which were collected by BC Stats. However, it should be noted that the confirmed response rate itself was an aggregate measure, consisting both of actual responses and proxy responses. In total, there were 3,902 confirmed responses out of a sample of 5,000 giving a confirmed response rate of 78.0%. The composition of confirmed responses is provided below in Table 1.

Table 1: Confirmed Response Rates

Response	Method of Confirmation	N*	% of Confirmed Responses	Total %
YES, my record is correct	Confirmed Yes (Phone)	1535	39.3%	84.4%
	Confirmed Yes (Mail)	674	17.3%	
	Confirmed Yes (Web)	136	3.5%	
	Confirmed Yes (Multiple Surveys)**	18	0.5%	
	Confirmed Yes (Other)***	0	0.0%	
	Confirmed Yes By Proxy	931	23.9%	
NO, my record is not correct	Confirmed No (Phone)	71	1.8%	15.6%
	Confirmed No (Mail)	55	1.4%	
	Confirmed No (Web)	16	0.4%	
	Confirmed No (Multiply Surveys)**	1	0.0%	
	Confirmed No (Other)***	2	0.1%	
	Confirmed No By Proxy	463	11.9%	

\* Number of confirmed responses, based on “accuracy not-included” currency definition

\*\* Some respondents completed more than one survey (i.e. a phone and web survey)

\*\*\* Instances where confirmation was not made by survey instrument (i.e. voter contacted EBC and confirmed their voter list information directly)

## “Worst-Case” Scenario Response Findings

The imputed response findings represent the statistical analysis of confirmed responses in combination with unconfirmed non-responses. In order to provide estimates of currency for non-responses, two distinct methods of analysis were used in this study. The first method assumed that all non-responses represent voter records that are not current. This can be thought of as a “worst-case” scenario as it produces a decidedly conservative estimate of currency.

Using this “worst-case” scenario approach, it was possible to generate two separate weighted currency proportions. The first proportion provided a measure of currency that focused solely on the correctness of a voter’s residential address within the Elections BC Voters List. For an address to be considered incorrect, the updated address information collected from the respondent had to be either entirely or substantially different than the residential address found within the voters list. This first measure of currency, identified as having *accuracy not included*, was calculated to be 65.9% ( $\pm 1.3\%$ , 19 times out of 20). The second “worst-case” scenario, used an alternate definition of currency, which interpreted any inaccuracies in a voter’s residential or mailing address as meaning that the voter’s information on the voters list was not current. This measure uses a similar currency definition to what was used in the July 2009 survey, and as such, allows for direct comparison between studies. This second measure of currency, with *accuracy included*, was estimated to be 64.4% ( $\pm 1.3\%$ , 19 times out of 20). Refer to Table 2 for a comparison of “worst-case” scenario currency estimates over time.

Table 2: “Worst-case” Scenario Currency Estimates

Audit	Currency Definition	Weighted Currency	Standard Error	Margin of Error ( $\pm$ )	95% Confidence Interval	
					Lower	Upper
July, 2008 (N=1000)	Accuracy included	63.7%	0.015	3.0%	60.7%	66.8%
January, 2009 (N=5000)	Accuracy included	64.4%	0.007	1.3%	63.1%	65.8%
	Accuracy not included	65.9%	0.007	1.3%	64.6%	67.2%

While comparisons between July 2008 and January 2009 indicated an increase in currency of 0.7% percentage points, the improvement was observed to be not statistically significant. With this said, it is important to keep in mind how currency was defined for the “worst-case” scenario estimates. As the disposition of unconfirmed records was assumed to be entirely not current, the proportion of non-imputed currency became directly linked to response rate. For the July 2008 survey, the inclusion of an extended survey window and two-staged phone sourcing procedure likely allowed for a greater number of confirmed responses to be included in the final dataset, which in turn decreased the number of non-current unconfirmed records. A comparison of confirmed response rates between July 2008 and January 2009 is provided in Table 3.



Table 3: Between Study Methodology Comparison

Audit	Survey Methodology	Currency Definition	"Worst Case" Scenario		
			Yes	No	Unconfirmed
July, 2008 (N=1000)	5 week survey window Auto/manual phone sourcing	Accuracy included	63.0%	19.9%	17.1%
January, 2009 (N=5000)	4 1/2 week survey window Auto phone sourcing	Accuracy included	64.4%	13.6%	22.0%
		Accuracy not included	65.9%	12.2%	22.0%

### Multiple Imputation Response Findings

An alternate method of estimation was made possible through the use of multiple imputation. Rather than assuming all non-responses represent an incorrect voter record, multiple imputation treats non-responses as missing at random. It should be noted however, that this does not mean data are missing completely at random (MCAR). Rather, the currency of non-responses can be predicted based on the analysis of relationships between other variables throughout the dataset. The resulting analysis produces a probability as to whether or not the disposition of a non-response is current. Similar to the "worst-case" scenario estimates, it was possible to obtain two additional measures of currency using the multiple imputation procedure. The first multiple imputed currency measure provided a voter list currency proportion of 81.9% ( $\pm 1.2\%$ , 19 times out of 20) using the *accuracy not included* currency definition. An estimate was also generated using the *accuracy included* currency definition and provided an estimated proportion of 80.1% ( $\pm 1.5\%$ , 19 times out of 20). A summary of these values are included in Table 4, alongside the equivalent estimates from the July 2008 survey.

Table 4: Multiply Imputed Currency Estimates

Audit	Currency Definition	Currency	Standard Error	Margin of Error ( $\pm$ )	95% Confidence Interval	
					Lower	Upper
July, 2008 (N=1000)	Accuracy included	74.8%	0.017	3.3%	71.5%	78.1%
January, 2009 (N=5000)	Accuracy included	80.1%	0.006	1.2%	78.9%	81.3%
	Accuracy not included	81.9%	0.006	1.2%	80.6%	83.1%

Similar to the "worst-case" scenario estimates, the *accuracy included* imputed measure of currency can be directly compared with results from the July 2009 survey. Applying a two sample Z-test reveals a 99.5% probability that the difference in currency estimates between July 2008 and January 2009 was statistically significant. In other words, the increase in currency of 5.3% percentage points from July to January appear to be

statistically significant using a 95% threshold. On a more practical level, the increase in currency estimates suggests that list improvement efforts, rather than sampling error, had a measurable impact on the list currency.

With this in mind, it should be noted that differences in survey methods between the July 2008 and January 2009 may have obscured an even larger improvement to the voters list. Specifically, methodological changes made to the survey instrument and high-priority mail service in addition to refinements made to the multiple imputation model may have served to reduce the measured currency values for the January 2009 survey. For the April 2009 survey though, it is hoped that these variables can be controlled to some extent, and provide a post-enumeration estimate of currency that will be immediately comparable to the January 2009 results. Assuming the April 2009 post-enumeration survey uses a similar sample size to the January 2009 survey, it is possible to determine the amount of improvement needed to be considered statistically significant. A summary of this analysis is provided in Table 5.

**Table 5: Significant Currency Improvements Estimates for April 2009**

Audit	Significance Level	Necessary Currency Proportion*	Percentage point increase from January
April, 2009 (N=5000)	95.0%	84.0%	2.1%
	97.5%	84.5%	2.6%
	99.0%	78.4%	3.0%

\*Currency using *accuracy not included* definition

As the sample size for this iteration of the voters list Quality Measurement was sufficiently large, it was possible to generate finer grained analyses across demographic variables. In an effort to align currency estimates with the demographics presented in BC Stats' eligibility estimates, a set of currency measures has been developed for both gender and age categories. It should be noted though, that a question confirming gender or age was not included on any of the survey instruments and as result, it was necessary to infer these demographics based on relevant information found within the provincial voters list. This information however, was not complete for all 5,000 sampled records, and therefore, only a subset of 4,587 records from the survey will be included in the analysis. Additionally, due to the disproportionate weighting of the subset, caution should be used when interpreting the demographic currency values within the context of the provincial currency estimates. The demographic measures, using the *accuracy not included* currency definition, are presented in Table 6.

Table 6: Age and Gender Currency Estimates

Age Brackets	Female		Male		Total (Male and Female)	
	Currency*	Count	Currency*	Count	Currency*	Count
18-24	77.9%	84	78.7%	104	78.3%	188
25-29	66.7%	110	67.6%	139	67.2%	249
30-34	72.2%	196	75.4%	181	73.7%	377
35-39	77.3%	204	79.4%	208	78.4%	412
40-44	78.8%	221	83.0%	207	80.8%	428
45-49	81.4%	263	79.2%	255	80.3%	518
50-54	83.8%	298	88.4%	263	85.9%	561
55-59	87.6%	253	88.4%	219	88.0%	472
60-64	88.5%	205	86.6%	216	87.5%	421
65-69	85.6%	141	88.6%	138	87.1%	279
70-74	86.9%	116	90.9%	96	88.7%	212
75-79	91.7%	86	91.1%	101	91.4%	187
80-84	88.5%	75	87.8%	62	88.2%	137
85+	76.1%	97	80.7%	49	77.6%	146
<b>Total</b>	<b>81.8%</b>	<b>2349</b>	<b>83.2%</b>	<b>2238</b>	<b>82.5%</b>	<b>4587</b>

\* Currency measures represent values weighted across PED strata

Comparing currency values across the gender category revealed small differences between currency values for women and men. Overall, currency estimates for women were lower than the corresponding estimates for men. However, these differences, both at an aggregate level and within age brackets, were not statistically significant at a 95% threshold. In terms of age bracket comparisons, analysing the overall currency estimate for voters aged 25 to 29 indicated an estimate that was significantly lower than the majority of all other age brackets. More specifically, the only age brackets that did not have a statistically higher currency estimate when compared to voters aged 25 to 29, were for voters aged 30 to 34 or voters aged 85 and more.

A further breakdown of currency measures can be generated across the 85 Provincial Electoral Districts (PED). However, due to the large number of PED's relative to the survey's total sample size, PED level estimates provide only very general indicators of currency for each district. This generality is reflected in the large confidence intervals for each PED. In order to obtain confidence intervals that fall within standard thresholds of significance ( $\pm 2.5\%$ , 19 times out of 20), strata level sample sizes would need to increase by several orders of magnitude, resulting in a prohibitively large total sample size. However, for future iterations of the Voters List Quality Measurement, targeted sampling adjustments to low currency PED's can be implemented in order to achieve confidence intervals that provide more practical benefit to Elections BC. The PED level currency measures are summarised in Table 7 and Table 8 for both *accuracy not included* and *accuracy included* currency definitions.

## APPENDIX I

**Table 7: PED Level Currency Estimates**

PED	Accuracy Not Included				Accuracy Included				
	Currency	95% CI	Lower	Upper	Currency	95% CI	Lower	Upper	
1	ABM	81.1%	10.0%	71.1%	91.1%	80.4%	10.7%	69.6%	91.1%
2	ABS	74.9%	11.6%	63.3%	86.5%	75.1%	11.3%	63.8%	86.5%
3	ABW	80.3%	11.0%	69.2%	91.3%	78.6%	12.1%	66.6%	90.7%
4	APR	80.4%	12.3%	68.1%	92.7%	77.1%	12.3%	64.9%	89.4%
5	BDS	79.8%	13.0%	66.8%	92.7%	79.5%	12.9%	66.6%	92.3%
6	BND	73.7%	10.8%	63.0%	84.5%	70.5%	11.4%	59.0%	81.9%
7	BNE	89.8%	8.1%	81.7%	98.0%	88.2%	9.1%	79.1%	97.3%
8	BNL	81.3%	10.4%	70.9%	91.7%	82.6%	9.9%	72.7%	92.5%
9	BNN	89.9%	7.5%	82.3%	97.4%	87.5%	7.8%	79.7%	95.4%
10	CBC	80.6%	15.0%	65.5%	95.6%	79.8%	14.2%	65.5%	94.0%
11	CBN	80.0%	12.2%	67.8%	92.2%	78.9%	12.5%	66.4%	91.4%
12	CHC	81.2%	10.0%	71.2%	91.2%	81.3%	10.7%	70.6%	92.0%
13	CHH	81.0%	11.7%	69.3%	92.7%	78.6%	11.1%	67.5%	89.7%
14	CLR	77.0%	15.0%	62.1%	92.0%	71.5%	16.0%	55.5%	87.5%
15	CMX	85.0%	7.8%	77.2%	92.8%	82.4%	9.3%	73.1%	91.7%
16	CQB	87.9%	8.8%	79.1%	96.7%	87.7%	9.8%	78.0%	97.5%
17	CQM	86.4%	8.7%	77.7%	95.1%	85.1%	9.0%	76.2%	94.1%
18	CWV	86.7%	9.1%	77.6%	95.9%	76.4%	11.4%	64.9%	87.8%
19	DLN	88.6%	9.7%	78.9%	98.2%	90.0%	8.8%	81.1%	98.8%
20	DLS	88.3%	8.4%	79.9%	96.7%	86.5%	9.7%	76.8%	96.2%
21	ESR	83.5%	9.1%	74.4%	92.6%	78.6%	9.9%	68.7%	88.6%
22	FLA	89.5%	7.5%	82.0%	97.0%	88.1%	9.0%	79.0%	97.1%
23	FRN	78.1%	13.2%	64.9%	91.3%	75.1%	13.5%	61.6%	88.6%
24	JDF	85.5%	9.7%	75.8%	95.2%	84.0%	10.2%	73.8%	94.3%
25	KAN	84.8%	9.6%	75.2%	94.3%	81.7%	10.3%	71.3%	92.0%
26	KAS	78.0%	11.2%	66.7%	89.2%	74.3%	10.9%	63.4%	85.2%
27	KLA	83.6%	9.2%	74.4%	92.8%	82.9%	9.6%	73.3%	92.5%
28	KMI	77.5%	9.8%	67.6%	87.3%	74.6%	9.7%	64.9%	84.3%
29	KOE	79.6%	13.2%	66.4%	92.8%	77.3%	13.4%	63.9%	90.7%
30	KOW	71.2%	13.3%	57.9%	84.5%	67.8%	14.0%	53.8%	81.8%
31	LLY	80.6%	9.7%	70.9%	90.3%	78.6%	10.0%	68.6%	88.6%
32	MRM	84.4%	9.7%	74.8%	94.1%	86.2%	9.6%	76.7%	95.8%
33	MRP	90.6%	7.3%	83.3%	97.9%	89.9%	8.2%	81.7%	98.1%
34	NAN	86.8%	8.9%	77.9%	95.7%	85.7%	9.2%	76.4%	94.9%
35	NCW	78.4%	10.5%	67.9%	89.0%	71.7%	11.7%	60.0%	83.5%
36	NEC	79.3%	14.6%	64.6%	93.9%	71.1%	16.4%	54.7%	87.6%
37	NEL	81.4%	11.9%	69.5%	93.3%	80.9%	12.1%	68.8%	92.9%
38	NEW	78.5%	9.5%	69.0%	88.0%	77.1%	10.4%	66.7%	87.6%
39	NOC	73.4%	17.0%	56.4%	90.4%	71.6%	18.1%	53.5%	89.7%
40	NOI	74.5%	10.6%	63.9%	85.0%	74.3%	10.5%	63.9%	84.8%
41	NVL	90.9%	7.1%	83.8%	98.0%	89.8%	7.5%	82.3%	97.3%
42	NVS	85.6%	10.6%	75.0%	96.3%	86.2%	10.3%	75.9%	96.5%
43	OBG	79.9%	9.5%	70.4%	89.4%	80.3%	11.2%	69.1%	91.5%

Table 8: PED Level Currency Estimates Continued

PED	Accuracy Not Included				Accuracy Included				
	Currency	95% CI	Lower	Upper	Currency	95% CI	Lower	Upper	
44	PAQ	85.8%	9.4%	76.4%	95.1%	84.8%	9.4%	75.4%	94.1%
45	PCN	57.5%	17.9%	39.6%	75.4%	52.0%	17.9%	34.1%	69.9%
46	PCS	78.7%	18.0%	60.7%	96.7%	78.5%	18.4%	60.2%	96.9%
47	PEN	88.9%	8.9%	80.0%	97.8%	89.1%	8.8%	80.3%	97.9%
48	POC	87.3%	8.2%	79.1%	95.5%	87.0%	8.8%	78.2%	95.8%
49	POM	85.5%	9.6%	75.8%	95.1%	84.6%	11.0%	73.6%	95.6%
50	POR	74.5%	12.3%	62.2%	86.8%	69.1%	13.4%	55.8%	82.5%
51	PRM	84.3%	9.9%	74.4%	94.2%	84.8%	9.2%	75.5%	94.0%
52	PRV	79.3%	9.6%	69.6%	88.9%	79.8%	9.7%	70.1%	89.5%
53	RCC	79.7%	9.6%	70.1%	89.3%	76.5%	10.1%	66.4%	86.6%
54	RCE	89.6%	7.5%	82.0%	97.1%	89.0%	7.8%	81.1%	96.8%
55	RCS	90.3%	7.2%	83.1%	97.4%	89.6%	8.1%	81.6%	97.7%
56	SAN	91.7%	9.8%	81.9%	100.0%	83.3%	12.8%	70.5%	96.1%
57	SAS	83.2%	10.0%	73.2%	93.2%	75.5%	11.3%	64.2%	86.8%
58	SHU	76.4%	10.7%	65.7%	87.0%	73.5%	11.2%	62.3%	84.7%
59	SKE	80.2%	13.8%	66.4%	94.0%	77.4%	15.3%	62.1%	92.7%
60	SKN	85.2%	15.6%	69.6%	100.0%	72.6%	18.8%	53.8%	91.5%
61	SRC	78.9%	11.1%	67.8%	90.0%	77.7%	11.2%	66.5%	89.0%
62	SRF	84.0%	11.5%	72.6%	95.5%	84.1%	10.3%	73.9%	94.4%
63	SRG	84.1%	11.9%	72.2%	95.9%	83.7%	11.0%	72.7%	94.8%
64	SRN	81.2%	10.6%	70.6%	91.9%	80.1%	11.8%	68.3%	92.0%
65	SRP	90.2%	8.4%	81.8%	98.6%	90.2%	8.4%	81.8%	98.6%
66	SRT	79.6%	10.6%	68.9%	90.2%	78.7%	11.0%	67.7%	89.7%
67	SWH	76.4%	12.1%	64.3%	88.5%	74.2%	11.8%	62.4%	86.0%
68	SWR	88.3%	9.5%	78.8%	97.9%	87.5%	10.0%	77.5%	97.5%
69	VFA	74.6%	10.3%	64.4%	84.9%	75.1%	9.7%	65.5%	84.8%
70	VFC	73.5%	11.9%	61.6%	85.4%	68.9%	11.9%	57.1%	80.8%
71	VFV	87.6%	8.1%	79.6%	95.7%	86.0%	8.6%	77.4%	94.6%
72	VHA	79.9%	10.1%	69.8%	90.0%	81.8%	9.2%	72.6%	91.0%
73	VKE	84.5%	9.0%	75.4%	93.5%	81.6%	9.2%	72.4%	90.9%
74	VKI	86.8%	8.6%	78.3%	95.4%	85.3%	9.9%	75.5%	95.2%
75	VLA	84.3%	8.9%	75.3%	93.2%	82.9%	10.2%	72.7%	93.1%
76	VMP	76.7%	10.1%	66.7%	86.8%	77.6%	11.4%	66.2%	89.0%
77	VNP	75.0%	10.6%	64.4%	85.6%	76.7%	10.4%	66.3%	87.0%
78	VNQ	82.0%	9.7%	72.3%	91.8%	82.0%	9.3%	72.7%	91.3%
79	VNW	74.1%	10.8%	63.3%	84.9%	73.8%	10.7%	63.1%	84.5%
80	VRM	87.8%	7.7%	80.1%	95.6%	87.4%	7.8%	79.6%	95.2%
81	VTB	76.4%	10.3%	66.1%	86.8%	76.6%	10.3%	66.2%	86.9%
82	VTS	84.9%	9.6%	75.3%	94.4%	83.5%	10.3%	73.3%	93.8%
83	WCA	86.9%	8.6%	78.4%	95.5%	87.1%	8.6%	78.5%	95.7%
84	WSS	73.2%	14.3%	58.9%	87.4%	72.8%	12.7%	60.1%	85.5%
85	WTK	71.3%	11.5%	59.8%	82.8%	62.2%	12.6%	49.7%	74.8%
<b>TOTAL</b>		<b>81.9%</b>	<b>1.2%</b>	<b>80.6%</b>	<b>83.1%</b>	<b>80.1%</b>	<b>1.2%</b>	<b>78.9%</b>	<b>81.3%</b>

\* All totals represent weighted values, whereas PED level measures are un-weighted

## QUALITY ESTIMATE

An estimate of overall list quality was calculated by multiplying the estimated proportion of coverage by the estimated proportion of currency and its associated error term.

Estimated coverage was: 91.8%

Estimated currency was: 81.9% ( $\pm 1.2\%$ , 19 times out of 20) <sup>3</sup>

The calculation of quality is:

$$\text{Coverage} \times \text{Currency} = \text{Quality (\%)}$$

$$91.8\% \times 81.9\% (\pm 1.2\%) = \mathbf{75.2\% (\pm 1.2\%, 19 \text{ times out of } 20)}$$

### Estimated Quality Findings

Compared to the estimates from the July 2008 survey, quality measurements calculated for the January 2009 survey indicate an improvement in list quality across all quality measures. A moderate improvement of 2.2 percentage points was observed to occur between the July 2008 and January 2009 *accuracy included* “worst case” scenario measurements. The probability that this slight increase represented an actual improvement in list quality was calculated to be 86.8%, and as such, determined to be not statistically significant at a 95% threshold. As mentioned above though, the “worst case” scenario findings for both surveys are largely dependent on the overall response rate of the study. As a result, differences in survey methods between both surveys may have significantly impacted the “worst case” scenario currency estimates, which in turn reduced the associated measures of list quality for the January 2009 survey.

In terms of improvement, list quality was observed to increase by 6.7 percentage points for the measures based on the multiply imputed *accuracy included* currency estimates. This improvement was determined to be statistically significant, and the increase was large enough to approach a 100% significance threshold. Provided the April 2009 iteration of the Voters List Quality Measurement uses a 5,000 point sample, an even more moderate increase of 2.2 percentage points would be sufficient to provide a statistically significant improvement in list quality. Refer to Table 9 for a summary of coverage, currency and quality estimates for both the July 2008 and January 2009 surveys.

---

<sup>3</sup> This estimate is based on the *accuracy not included* definition of currency



Table 9: Coverage, Currency and Quality Estimates

Audit	Coverage	Currency Definition	Imputation Method	Currency	Quality
July, 2008	89.3%	Accuracy included	"Worst case" scenario	63.7%	56.9%
		Accuracy included	Multiple imputation	74.8%	66.8%
January, 2009	91.8%	Accuracy included	"Worst case" scenario	64.4%	59.1%
		Accuracy included	Multiple imputation	80.1%	73.5%
		Accuracy not included	"Worst case" scenario	65.9%	60.5%
		Accuracy not included	Multiple imputation	81.9%	75.2%

As with any statistical estimate, it was possible to generate a margin of error for each of the study's list quality measures. A margin of error, represents the uncertainty inherent to sampling and is defined by the lower and upper bounds of an estimates' confidence interval. For the purposes of this study, a 95% confidence interval was used, which indicates that 19 times out of 20, an estimated value will lie somewhere within the bounds of its confidence interval. For example, list quality using the multiply imputed *accuracy not included* currency definition, was measured to be 75.2% ( $\pm 1.2\%$ , 19 times out of 20). Based on the estimate's margin of error, 95% of the time the actual proportion of quality falls within of range of values, beginning at 73.9% and ending at 76.5%. A summary of each quality estimates' margin of error and accompanying confidence interval can be found in Table 10.

Table 10: Quality Estimates and Margins of Error

Currency Definition	Imputation Method	Quality	Margin of Error ( $\pm$ )	95% Confidence Interval	
				Lower Bound	Upper Bound
Accuracy included	"Worst case" scenario	59.1%	1.3%	57.8%	60.4%
Accuracy included	Multiple imputation	73.5%	1.2%	72.3%	74.7%
Accuracy not included	"Worst case" scenario	60.5%	1.3%	59.2%	61.8%
Accuracy not included	Multiple imputation	75.2%	1.2%	74.0%	76.4%

Overall, list quality has improved from July 2008 to January 2009. While the improvement has been statistically significant, adjustments in both survey methods and currency definitions may have played some part in reducing direct comparability across surveys. With this said, adopting a practical perspective on list quality improvement would suggest a relatively moderate increase of 6.7 percentage points in list quality actually represents a substantial improvement. When viewed within the context of a 2,949,358 record voters list, improvement in the list quality of nearly 198,000 records has a very practical relevance with respect to voters list improvement efforts.

## STACKED ADDRESS ANALYSIS

In this report's final version, a section covering the analysis of stacked address results will be included here.



---

## APPENDIX I: ESTIMATING ELIGIBLE VOTER POPULATION

---

The eligible voter population must be estimated on a provincial and sub-provincial (PED) basis. The sub-provincial estimates are made such that they sum to the provincial estimate.

### PROVINCIAL

There are four steps to estimating the number of eligible voters in British Columbia.

#### Step 1: Estimating Total Population

Statistics Canada produces estimates of the total population for Canada and the Provinces. The reference date for these estimates is the first day of each month and are produced using a component model with the 2006 Census adjusted for net census undercount forming the base. The population counts are released by Statistics Canada quarterly, approximately 3 months after the end of each quarter.

If available, the total population estimated by Statistics Canada is used. However, if the reference date for the eligible voter calculation is outside the published range of Statistics Canada, a forecast of the total provincial population is prepared by BC Stats using a standard component cohort-survival model. As the dates from the model will not match the voting dates, an interpolation between the closest estimated/forecasted quarterly data is performed to produce a total population count for the voting date.

#### Step 2: Removing the Population Aged 0 to 17

Age specific estimates of the provincial population are prepared by Statistics Canada each year with a reference date of July 1. The proportion of the British Columbia population aged 18 and over from the latest Statistics Canada estimate is applied to the total population in Step 1 to produce an estimate of the population 18 years of age and over.

#### Step 3: Removing Persons in BC Less Than 6 Months

An estimate of inter-provincial in-migrants aged 18 years and older for a six month period prior to the reference date is removed from the population estimated in Step 2. The estimate of inter-provincial in-migrants is taken either from Statistics Canada's most recent quarterly estimates, or if the reference period is outside the range published by Statistics Canada, the most recent estimate or forecast of quarterly inter-provincial in-migration prepared by BC Stats.

#### Step 4: Removing Non Canadian Citizens

To take into account the resident British Columbia population who are not Canadian citizens the following three components are removed from the population estimated in Step 3.

- a. The 18 and over immigrant population that were counted in the 2006 Census, had arrived in Canada prior to 1991 and are not citizens, is subtracted from the population estimated in Step 3. It is assumed that immigrants in Canada for more that 15 years who have not become a Canadian citizen will likely never become a citizen of Canada.
- b. The immigrant population from the last five years who would be 18 or over as of the reference date are subtracted from the population estimated in Step 3.<sup>4</sup> Given that residency requirements and processing time for citizenship takes a minimum of approximately 4 ½ years, it was considered reasonable to reduce the eligible estimate by the immigrant population for at least that period of time.
- c. Non-permanent Residents aged 18 years and over (i.e. persons in BC on a Student Visa, Work or Ministerial Permit, or are Refugee Claimants), are removed from the population estimated in Step 3. As the number of Non-permanent Residents in BC has been relatively stable for the past year, the most recent estimate published by Statistics Canada is used. The population derived in Step 4 is taken as the number of eligible voters as of the reference date.

### SUB-PROVINCIAL BY AGE AND SEX

The sub-provincial PED age and sex estimates are derived from the provincial estimate. Data from the 2001 and 2006 Censuses obtained from Statistics Canada, as well as Client Registry data from the BC Ministry of Health for 2006, 2007 and 2008 are used to distribute provincial population growth among the PEDs by age and sex and to determine voter eligibility. For the purposes of this estimate, all data has been aggregated into 15 age groups: 0-17, 18-24, 25-29, 30-34, ..., 80-84, and 85+.

#### Step 1: Estimating Base Population for Provincial Electoral Districts

Estimates of the population at the time of the 2006 Census for each PED by age group and sex are aggregated from small area estimates provided by Statistics Canada. The

---

<sup>4</sup> The immigrant population for the last five years is based on actual immigrant landings (not census). [Sources: Statistics Canada (quarterly components of population change) and Citizenship and Immigration Canada (personal communication)]

resulting estimates with a reference date of July 1, 2006 provide the base for our sub-provincial estimates.

The distribution of growth in the Client Registry from 2006-07 and 2007-08 by age group and sex are normalized and used to allocate the estimated provincial population growth in each period among the PEDs. Then, BC Stats' population estimates for the second half of 2008 and the beginning of 2009 are used in conjunction with the Client Registry historical growth rate estimates to arrive at a PED population by age group and sex for the reference date.

### **Step 2: Removing the Population Aged 0 to 17**

After ensuring the population estimates arrived at in Step 1 conform to BC Stats' provincial population estimates, the 0-17 age group is removed.

### **Step 3: Removing Persons in BC Less Than 6 Months**

Mobility data from the 2001 and 2006 Censuses obtained from Statistics Canada are used to estimate the proportion of BC's interprovincial in-migrants arriving in each PED by age group and sex. These rates are used to distribute recent migrants among the PEDs as well as age and sex categories. The estimated in-migrant level by PED, age group, and sex are then removed from the 18+ population from Step 2.

### **Step 4: Removing Non-Canadian Citizens**

2001 and 2006 Census data are also used to remove non-Canadian citizens over the age of 18 from the PED population estimated in Step 3. Provincial estimates of past immigrants who have never obtained citizenship, recent immigrants, and non-permanent residents are shared among the PEDs by age group and sex according to the distribution of non-citizens from the 2001 and 2006 Censuses. The resulting PED estimates are taken as the number of eligible voters as of the reference date.

## APPENDIX II: CURRENCY AUDIT – METHODOLOGY

### PHONE SOURCING

Information available in the voter’s list, including a voter’s name, home address and mailing address, allowed records to be matched with a telephone number.

The matching process consisted of a single phase of automated phone sourcing. The automated sourcing procedure takes information for each record and runs it through a set of hierarchical matching algorithms. Typically, the automated matching process is supported by a quality assurance inspection of the sourced phone number following each successive algorithm. However, this quality assurance process can extend the turnaround time of a two hour matching routine to several days. As a result, BC Stats opted to forgo the quality checks in an attempt to expedite the phone matching process. This sourcing methodology differed from the July 2008 survey in that a manual matching routine was not used. For the January 2009 survey, a manual matching process for a 5,000 point sample was estimated to take longer than the project timelines allowed for. Further details on the rules for automatic matching, in addition to manual matching routines can be found in Appendix VIII.

In total, 2,831 records were successfully matched to at least one phone number. Out of the 2,831 matched records, a subset of 120 records were also matched to at least two or more phone numbers. Phone matching efforts were further supported by the inclusion of phone numbers taken from Elections BC administrative files. This supplemental set of phone numbers provided an additional 519 records with a phone number, 370 of which had not been previously matched through the automated sourcing procedure. Presented in Table 11 is a further breakdown of all 3,201 records, including whether a number was determined to be correct or incorrect.

**Table 11: Phone Survey Results**

Correctness of Sourced Number	Phone Result	Automated Phone Match Only	Admin File Phone Match Only	Automated and Admin Match
Correct	Successfully Completed Survey	1376	161	68
	Unable to Complete Survey	218	16	6
	Respondent Deceased	3	0	0
Incorrect	Phone Number Not In Service	164	48	18
	Wrong Number	211	49	25
Unknown	Correctness of Number Uncertain	710	96	32

As the phone survey portion of the study progressed, it became apparent that additional phone sourcing of certain records would help bolster the response rate. As such, the phone survey vendor conducted directory assistance phone matching on 596 records. These records were chosen based on the results of multiple phone attempts

(i.e. the record's number was determined to be incorrect or otherwise unreachable). Out of this set of 596 records, an additional 296 numbers were successfully matched to a new phone number. This resulted in an additional 18 phone survey completions.

## **SURVEY DESIGN**

Data were collected through one of three survey instruments: phone, mail and web. Two slightly different versions of each survey instrument were created in order to capture stacked address information from a sub-set of 1,000 records. In total, six unique surveys were developed to collect voter list quality data from respondents (see Appendices III thru VI).

The mail survey form allowed respondents to confirm the correctness of three details, as stated in the BC Voters List. Respondents were given the option to state yes or no to the following three details:

- Name
- Date of birth
- Home address

If a voter indicated that any of the above details were incorrect, an open ended field was available for the respondent to provide their accurate and/or current information.

The phone survey asked respondents to confirm the correctness of four details, as stated in the BC Voters List:

- Name
- Date of birth
- Mailing address
- Home address

As with the mail survey, respondents were given the opportunity to provide updated information if they indicated one or more of the above details was incorrect.

The web survey was developed with a visual layout similar to the mail survey, and allowed respondents to confirm the correctness of four details, as stated in the BC Voters List:

- Name
- Date of birth
- Mailing address
- Home address

In addition to collecting updated information from respondents, the web survey offered respondents with the opportunity to provide a current phone number and email address through which Elections BC can contact the voter in the future.

For those voters selected to participate in the stacked address version of the survey, it was decided to place the stacked address question at the end of the questionnaire to ensure that all 5,000 voters were presented with a survey that was largely the same in layout and order.

## **SAMPLE DESIGN**

For this study, a sample of 5,000 voters was drawn from a January 13, 2009 extract of the Elections BC Voters List. The target population included all eligible BC voters who appeared on the Elections BC Voters List and were allocated to one of the 85 provincial electoral districts and lived at an address that was not identified as either being “frozen” or “retired”. Based on the January 13 extract, the target population consisted of 2,949,388 registered voters.

In order to obtain a sample that accurately reflected the distribution of the target population, a stratified sampling plan was developed. In total, 85 strata were used, each assigned to one of BC’s 85 PED’s. Rather than creating strata level sample sizes that were simply proportional to the population of each electoral district, BC Stats opted to incorporate variance measures from a previous quality audit. By doing so, it was possible to identify an optimal sample size for each strata that was dependent on the relative heterogeneity of its associated PED. The result was a smaller bound in the error of estimation, as compared to other sampling strategies.

As the only available pre-existing PED level variance measures were stratified across the previous 79 PED geographies, it was necessary to adjust the measures to reflect the current 85 PED geographies. This was accomplished by assigning the variance measure for an entire PED to its constituent dissemination base (DB) geographies, based on Canada Census data. The resulting variance measures were then matched to new ED values, and the resulting DB values were aggregated to the new ED level. While this method of adjustment assumed that the currency proportion for each of the previous 79 PED’s was consistent throughout, the end result offered a flexible and practical solution that also provided enough precision to satisfy the needs of the sampling methodology. The final calculation of sample size for each strata was achieved through the application of a Neymann Allocation (see Figure 1).

Figure 1: Neymann Allocation

$$n_i = n \left( \frac{N_i \sqrt{\hat{p}_i \hat{q}_i}}{\sum_{j=1}^{85} N_j \sqrt{\hat{p}_j \hat{q}_j}} \right), \quad i = 1, 2, \dots, 85$$

Usage of the Neymann Allocation is made possible by establishing a set sample size  $n$ . In greater detail,  $n_i$  represents the optimal sample size for the  $i$ th stratum;  $n$  is the overall sample size and  $N_i$  is the target population for the  $i$ th stratum. To provide an existing measure of variance,  $\hat{p}_j$ , PED level currency proportions were taken from the final quality measurement of the 2004/05 Voter List Quality Audit. As with all proportional variance calculations,  $q$  represents a correction factor for  $p$  and is defined as  $(1-p)$ . For a distribution of sample sizes, refer to Table 12 and Table 13.

## APPENDIX II

**Table 12: Distribution of Stratified Sample Sizes**

No.	Provincial Electoral District	PED	Estimated Population*	Measure of Variance**	Optimal Sample Size
1	Abbotsford-Mission	ABM	34,097	0.75	60
2	Abbotsford South	ABS	33,374	0.74	59
3	Abbotsford West	ABW	30,304	0.72	55
4	Alberni-Pacific Rim	APR	30,355	0.81	48
5	Boundary-Similkameen	BDS	27,763	0.80	45
6	Burnaby-Deer Lake	BND	34,040	0.67	65
7	Burnaby-Edmonds	BNE	33,478	0.69	63
8	Burnaby-Lougheed	BNL	35,152	0.70	65
9	Burnaby North	BNN	37,618	0.68	71
10	Cariboo-Chilcotin	CBC	19,776	0.62	39
11	Cariboo North	CBN	23,249	0.69	44
12	Chilliwack	CHC	36,092	0.76	62
13	Chilliwack-Hope	CHH	32,096	0.69	60
14	Columbia River-Revelstoke	CLR	23,520	0.85	34
15	Comox Valley	CMX	47,850	0.77	81
16	Coquitlam-Burke Mountain	CQB	30,922	0.76	53
17	Coquitlam-Maillardville	CQM	36,680	0.70	68
18	Cowichan Valley	CWV	40,942	0.82	63
19	Delta North	DLN	34,158	0.84	51
20	Delta South	DLS	34,020	0.74	60
21	Esquimalt-Royal Roads	ESR	37,271	0.71	69
22	Fort Langley-Aldergrove	FLA	42,148	0.80	68
23	Fraser-Nicola	FRN	20,489	0.62	40
24	Juan de Fuca	JDF	32,790	0.80	53
25	Kamloops-North Thompson	KAN	37,433	0.77	64
26	Kamloops-South Thompson	KAS	40,697	0.77	69
27	Kelowna-Lake Country	KLA	41,796	0.83	63
28	Kelowna-Mission	KMI	42,487	0.61	83
29	Kootenay East	KOE	29,283	0.88	39
30	Kootenay West	KOW	30,438	0.79	50
31	Langley	LLY	42,127	0.80	68
32	Maple Ridge-Mission	MRM	34,364	0.77	58
33	Maple Ridge-Pitt Meadows	MRP	36,207	0.77	62
34	Nanaimo	NAN	39,243	0.78	66
35	Nanaimo-North Cowichan	NCW	38,116	0.80	61
36	Nechako Lakes	NEC	15,309	0.58	31
37	Nelson-Creston	NEL	26,839	0.81	42
38	New Westminster	NEW	42,042	0.74	74
39	North Coast	NOC	14,956	0.74	26
40	North Island	NOI	39,220	0.75	69
41	North Vancouver-Lonsdale	NVL	37,521	0.67	71
42	North Vancouver-Seymour	NVS	36,927	0.89	46
43	Oak Bay-Gordon Head	OBG	38,345	0.72	70
44	Parksville-Qualicum	PAQ	40,559	0.78	68



Table 13: Distribution of Stratified Sample Sizes Continued

No.	Provincial Electoral District	PED	Estimated Population*	Measure of Variance**	Optimal Sample Size
45	Peace River North	PCN	22,671	0.86	31
46	Peace River South	PCS	17,076	0.90	21
47	Penticton	PEN	42,199	0.90	51
48	Port Coquitlam	POC	36,267	0.73	65
49	Port Moody-Coquitlam	POM	32,774	0.76	57
50	Powell River-Sunshine Coast	POR	35,538	0.86	50
51	Prince George-Mackenzie	PRM	33,097	0.70	61
52	Prince George-Valemount	PRV	34,744	0.60	69
53	Richmond Centre	RCC	41,352	0.72	75
54	Richmond East	RCE	40,438	0.67	77
55	Richmond-Steveston	RCS	41,899	0.69	78
56	Saanich North and the Islands	SAN	43,701	0.96	33
57	Saanich South	SAS	37,333	0.83	57
58	Shuswap	SHU	40,100	0.79	66
59	Skeena	SKE	20,772	0.81	33
60	Stikine	SKN	12,223	0.64	24
61	Surrey-Cloverdale	SRC	38,911	0.79	64
62	Surrey-Fleetwood	SRF	31,987	0.77	55
63	Surrey-Green Timbers	SRG	28,548	0.80	46
64	Surrey-Newton	SRN	29,214	0.67	55
65	Surrey-Panorama	SRP	37,287	0.75	66
66	Surrey-Tynehead	SRT	33,280	0.76	57
67	Surrey-Whalley	SWH	32,695	0.80	53
68	Surrey-White Rock	SWR	39,629	0.91	46
69	Vancouver-Fairview	VFA	42,423	0.69	79
70	Vancouver-False Creek	VFC	33,784	0.66	65
71	Vancouver-Fraserview	VFV	37,099	0.75	65
72	Vancouver-Hastings	VHA	38,630	0.70	71
73	Vancouver-Kensington	VKE	35,868	0.65	69
74	Vancouver-Kingsway	VKI	35,211	0.74	62
75	Vancouver-Langara	VLA	37,581	0.62	74
76	Vancouver-Mount Pleasant	VMP	37,199	0.66	71
77	Vancouver-Point Grey	VNP	40,079	0.67	76
78	Vancouver-Quilchena	VNQ	38,913	0.77	66
79	Vancouver-West End	VNW	36,961	0.65	71
80	Vernon-Monashee	VRM	45,275	0.81	72
81	Victoria-Beacon Hill	VTB	42,380	0.71	78
82	Victoria-Swan Lake	VTS	37,995	0.84	56
83	West Vancouver-Capilano	WCA	39,039	0.76	67
84	West Vancouver-Sea to Sky	WSS	34,104	0.84	51
85	Westside-Kelowna	WTK	41,019	0.84	61

\* Estimated population of eligible voters in BC who are allocated to a PED and not at a retired or frozen address

\*\* Variance measures taken from final audit of the 2004/05 VLQA

## SURVEY ADMINISTRATION

Once phone sourcing was complete, the sample of 5,000 records was divided into two groups; voters whose records were successfully matched to a phone number and those who weren't.

If there was a sourceable telephone number for the respondent's record, the voter was sent an introductory letter by standard mail. The letter notified the voter that they would be contacted by telephone in the coming weeks and asked to participate in a short phone survey. Finally, the intro letter provided a toll free number through which a voter could contact the phone vendor and complete the survey at a time of the respondent's choosing.

From January 27 to February 10, 2009, attempts were made to contact 3,201 individuals by phone. Following the main phase of calling, additional attempts were made between February 10 to February 20 to contact an additional 296 numbers. These numbers were for voters for whom a second number was matched to their record through follow-up phone sourcing. If a respondent's telephone number was ultimately found to be incorrect or otherwise unreachable, they were then allocated to a sub-list and subsequently sent a letter survey through Canada Post Xpresspost mail.

In a handful of cases, a respondent or family member of a respondent contacted Elections BC directly and confirmed the currency of their voters list information over the phone. The details of the information was then transmitted to BC Stats for inclusion into the study's dataset. In the event a phone, mail or web survey completion was not received from one of these respondents, the information they provided to Elections BC was treated as an actual survey completion.

If no telephone number was easily attributed to a voter's record, the voter was sent a survey through Canada Post Xpresspost mail. In total, 3,265 registered letters were mailed to voters, with a mail survey completion rate of 22.7%. From this set of 3,265 mailings, 1761 letter surveys were sent in the initial Xpresspost mailing date on January 26 (all 3201 introductory letters were sent out on January 23<sup>rd</sup>). The remaining 1,504 Xpresspost letters were sent out in one of four batches, as part of the sub-list mail outs. See Table 14 for a summary of all Xpresspost mailings. Responses, including undeliverable returns, were recorded until February 27, 2009.

Table 14: Summary of Xpresspost Mailings

Mail Status as of February 27th	Initial Mailing	Sub-list Mailings				Total
	Jan 26th	Jan 29th	Feb 2nd	Feb 9th	Feb 17th	
Survey Completed	494	8	38	135	67	742
Mail Survey Returned	395	11	18	62	30	516
Mail Survey Not Returned	872	22	75	386	650	2005
Total Mail Surveys	1761	41	131	583	749	3265

## DECISION RULES

A set of decision rules were developed in order to guide the data collection and analysis of records where a completed phone or mail survey could not be obtained. Listed below are the main proxy rules used throughout the course of the study. It should be noted that in instances where an inconsistency appeared between actual survey responses and a record's proxy information, the survey data would take precedence. For example, if a telephone response indicated that the voter's home address was correct, but their introductory letter was returned as moved, the record would be considered current.

*Phone proxies:* Due to time constraints, if information could be gathered from other sources (e.g. family member), then that information would be collected and recorded as a confirmed response. This also included instances where a family member contacted Elections BC directly by phone to confirm the currency of a voter's information.

*Canada Post Xpresspost mail proxies:* In order to successfully deliver a piece of Xpresspost mail to a home address, Canada Post requires signature confirmation. This signature can be provided by anyone who is fourteen years of age or older at the address. If a mail carrier is unable to deliver the registered mail to the home, then a notice is left on the door indicating to the addressee that there is a piece of mail available for pick up at a nearby post office. In order to successfully pick up the registered mail from a post office, the addressee must provide a piece of photo ID to the Canada Post customer service representative. Acceptable photo ID needs to contain both a name and address that matches the registered mail's delivery information.

In the majority of cases, a digital copy of the signature was uploaded for viewing to the Canada Post tracking website. Based on this information, it was possible to make two separate proxy decisions using signature data.

- If a survey was successfully delivered to an address, the presence of a signature match was considered to be a proxy confirmation that the record was correct. A signature match was defined as any instance where at least the first initial and

last name of the digital signature matched the first initial and last name of the record.

- If a survey was successfully picked up from a post office, then due to Canada Post's delivery requirements, the record was also considered a proxy confirmation that the record was correct.

These proxies only applied to cases where no response was received from the addressee prior to the February 27 cut-off date.

*Mail undeliverable proxies:* if the mail was undeliverable as determined by Canada Post, the returns were considered either as an incorrect proxy or unconfirmed, depending on the reason that the letter was not successfully delivered:

The following tracking details were considered as an incorrect proxy: no such address; address incomplete; moved/unknown; no such post office; and item was redirected to receiver's new address.

Records were considered as unconfirmed, if the mail tracking details stated unclaimed; attempted delivery but no pick up; item was picked up but without a recorded signature; item not in Canada Post possession but without a recorded signature; and, item refused by addressee.

It should be noted that for nearly 200 records, Canada Post's tracking web page did not display any signature information, despite indicating that the Xpresspost mail was successfully delivered. As a result, the availability of proxy information for these records was greatly reduced. It is unclear at this time how this error may have affected the overall currency estimate. In all likelihood, this error would have increased the total proportion of unconfirmed records and therefore increased the number of records that required multiple imputation.

## MISSING DATA

In order to estimate voters list currency for unconfirmed responses, BC Stats made use of multiple imputation (MI). Compared to other methods of imputation, the MI method offers several benefits, including the introduction of random variance to the estimate and a robustness to violations of normality.

With this in mind, there are two assumptions that need to be made if missing data are to be estimated through MI. First, the data both before and after imputation, are assumed to follow a multivariate normal distribution. The second assumption is that missing data are missing at random (MAR). As mentioned above, MAR does not mean data are missing completely at random. Rather, the rate at which data are missing can

be predicted, based on the analysis of relationships between other variables throughout the dataset.

There are three distinct steps to multiple imputation. First, the imputation process is repeated  $m$  times to generate  $m$  complete datasets. Second,  $m$  datasets are analyzed using conventional statistical tools and third, results from the  $m$  datasets are combined into a summary set of findings. Typically, as few as three to five imputations are adequate and the end results offer the benefit of introducing uncertainty into the model. This in turn generates valid statistical inferences that correctly reflect this uncertainty due to missing data. For the January 2009 study, five imputed datasets were generated and then combined to produce the final estimates of currency and quality.

In the July 2008, seven variables were used to predict an unconfirmed record's currency. These variables included the following: a voter's age, whether a voter lived in a single unit or multi-unit dwelling, the absence or presence of a voter's driver's license number, social insurance number (SIN), and gender within the provincial voters list, the date of a voter's most recent status update and finally, the confirmed currency of other voters within the sample. With the exception of age and status update, all variables were coded dichotomously, with 1 assigned to male, yes or current and 0 assigned to all other values. For the January 2009 survey however, some small adjustments were made to the framework of predictive variables.

Based on several analyses, the original SIN variable was found to have little to no predictive relationship with the currency of confirmed responses in the January 2009 dataset. In its place, two new variables were introduced into the regression model. The first new variable used a field from the voters list that indicated whether a residential address was different from a record's mailing address. The second new variable incorporated the most recent effective date for a record's residential address. These adjustments were observed to increase the model's overall R squared value by 3%, and therefore, the predictive accuracy of the MI procedure. Both the MI procedure and the predictive model were developed and analyzed with SPSS's AMOS 16.

**APPENDIX III: TELEPHONE SURVEY SCRIPT (STANDARD)**

**INTRODUCTION**

Hello may I speak with <Given Name > <Surname >. My name is \_\_\_\_\_. I am calling on behalf of Elections BC, a non-partisan Office of the Legislature, responsible for administering the *Election Act*. We are conducting a short 2 minute survey to measure the quality of the provincial voters list. A record from this address has been selected for confirmation. This quality improvement survey is important to ensure that voters receive necessary voting information.

We would like you to know that responses to this questionnaire will be kept confidential by BC STATS. Under Section 9 of the *Statistics Act*, BC STATS cannot disclose information that could be used to identify an individual response to any person, organization or government agency. Section 9 of the *Statistics Act* applies despite the provisions of the *Freedom of Information and Protection of Privacy Act (FOIPPA)*, other than *Section 44(1)(b)(2) (2.1) and (3) of FOIPPA*.

We would also like you to know that any updated voters list information collected from this survey will be used by Elections BC under Section 12 of the *BC Statistics Act*. You may refuse to share your updated voters list information with this organization by writing to the Executive Director of BC Stats before February 16, 2009.

May I continue?

Continue - correct person.....	01	=> Q1
Correct name & number - call back anytime.....	20	=> /INT3
Correct name & number - specific call back .....	21	=> /INT3
Not at this number/ address.....	22	=> /INT2
Correct name & number - refused .....	23	=> /INT4
Refused - would not confirm if it was the correct person .....	02	=> /END
Call-back - no answer .....	03	=> /END
Line busy .....	04	=> /END
Not in service .....	05	=> /END
Deceased .....	06	=> /END
Language difficulties .....	07	=> /END
No phone number .....	15	=> /END

**INT2**

**Proxy end**

Thank you for your time, and have a good day/ afternoon/ evening.

Not at this number/ address.....	22	=> /END
Correct name & number - refused .....	23	=> /END

**INT3****Call back end**

Thank you. We will call back at <Date and Time >. Have a good day/ afternoon/ evening.

Correct name & number call back anytime ..... 20      => /END  
 Correct name & number specific call back..... 21      => /CB

**INT4****Web and proxy end**

I understand you do not wish to complete the survey over the phone. Would you prefer to complete the survey online?

Yes ..... 1      => WEB1  
 No ..... 23      => INT2  
 Refused ..... 23      => INT2

**WEB1****Web end**

To access the survey online, go to <http://www.survey.gov.bc.ca/logins/voterslist.htm> Once there, type in your personal and confidential survey password: < USERID >.

Correct name & number - refused ..... 23      => INT2

**Q1**

To confirm, is your name <Given Name> <Surname>?

Yes ..... 1      => Q2  
 No ..... 2      => Q1a  
 Refused ..... 3      => Q2

**Q1a**

You indicated that your name is not <Given Name> <Surname>, what is your correct name?

Given Name: \_\_\_\_\_  
 Surname: \_\_\_\_\_

Refused ..... 3      => Q2

**Q2**

Is your date of birth <Date of Birth >?

Yes ..... 1      => Q3  
 No ..... 2      => Q2a  
 Refused ..... 3      => Q3

**Q2a**

You indicated that your date of birth is not <Date of Birth >, what is your correct date of birth?

Year (YYYY): \_\_\_\_\_

Month (MM): \_\_\_\_\_

Day (DD): \_\_\_\_\_

Refused ..... 3      => Q3

**Q3**

**IF ANY ARE WRONG THEN CHOOSE "NO"**

Is your home address:

Unit Number

Building Number

Street Prefix (East, West, etc.)

Street Name

Street Type

Street Suffix (East, West, etc.)

City?

Yes ..... 1      => Q4

No ..... 2      => Q4a

Refused ..... 3      => Q4

**Q3a**

You indicated that the home address found in Elections BC's records is incorrect, what is your correct home address?

Unit Number: \_\_\_\_\_

Building Number: \_\_\_\_\_

Street Prefix (East, West, etc.): \_\_\_\_\_

Street Name: \_\_\_\_\_

Street Type: \_\_\_\_\_

Street Suffix (East, West, etc.): \_\_\_\_\_

City: \_\_\_\_\_

Refused ..... 3      => Q4



**Q4**

**IF ANY ARE WRONG THEN CHOOSE "NO"**

Is your current mailing address:

Mail Line 1  
 Mail Line 2  
 Mail City  
 Postal Code?

Yes ..... 1      => INT5  
 No ..... 2      => Q4a  
 Refused ..... 3      => INT5

**Q4**

You indicated that the mailing address found in Elections BC's records is incorrect, what is your correct mailing address?

Mail Line 1: \_\_\_\_\_  
 Mail Line 2: \_\_\_\_\_  
 Mail City: \_\_\_\_\_  
 Postal Code: \_\_\_\_\_

Refused ..... 3      => INT5

**INT5**

=> INT if	NOT (Q1=2 OR Q2=2 OR Q3=2 OR Q4=2)
-----------	------------------------------------

**Completed with incorrect information end**

In preparation for the provincial election that will be on May 12<sup>th</sup>, 2009, Elections BC is also conducting a mail-out enumeration starting February 2nd, 2009. Any information that you provided through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

On behalf of Elections BC, I would like to thank you very much for your time today. The information you provided in this survey will be used both to assess the overall quality of the provincial voters list and to update your records within Elections BC's databases.

If you do not want this updated information to be shared with Elections BC, you must send a request to the Executive Director of BC Stats (Don McRae, PO Box 9410 Stn Prov Govt, Victoria, BC, V8W 9V1).

The request must be made in writing, signed and received by BC Stats no later than February 16, 2009, If you make this request, Elections BC will not be informed that your data were removed from the file.

If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to [www.elections.bc.ca](http://www.elections.bc.ca)

Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information incorrect ..... 24           => /END

**INT**

**End**

On behalf of Elections BC, I would like to thank you very much for your time today. If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to [www.elections.bc.ca](http://www.elections.bc.ca)  
 Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information is correct (or refused).....	01	=> /END
Refused - would not confirm if it was the correct person .....	02	=> /END
Call-back no answer.....	03	=> /END
Line busy .....	04	=> /END
Not in service .....	05	=> /END
Deceased .....	06	=> /END
Language difficulties .....	07	=> /END
No phone number .....	15	=> /END

## APPENDIX IV: TELEPHONE SURVEY SCRIPT (STACKED ADDRESS)

### INTRODUCTION

Hello may I speak with <Given Name > <Surname >. My name is \_\_\_\_\_. I am calling on behalf of Elections BC, a non-partisan Office of the Legislature, responsible for administering the *Election Act*. We are conducting a short 2 minute survey to measure the quality of the provincial voters list. A record from this address has been selected for confirmation. This quality improvement survey is important to ensure that voters receive necessary voting information.

We would like you to know that responses to this questionnaire will be kept confidential by BC STATS. Under Section 9 of the *Statistics Act*, BC STATS cannot disclose information that could be used to identify an individual response to any person, organization or government agency. Section 9 of the *Statistics Act* applies despite the provisions of the *Freedom of Information and Protection of Privacy Act (FOIPPA)*, other than *Section 44(1)(b)(2) (2.1) and (3) of FOIPPA*.

We would also like you to know that any updated voters list information collected from this survey will be used by Elections BC under Section 12 of the *BC Statistics Act*. You may refuse to share your updated voters list information with this organization by writing to the Executive Director of BC Stats before February 16, 2009.

May I continue?

Continue - correct person.....	01	=> Q1
Correct name & number - call back anytime.....	20	=> /INT3
Correct name & number - specific call back .....	21	=> /INT3
Not at this number/ address.....	22	=> /INT2
Correct name & number - refused .....	23	=> /INT4
Refused - would not confirm if it was the correct person .....	02	=> /END
Call-back - no answer .....	03	=> /END
Line busy .....	04	=> /END
Not in service .....	05	=> /END
Deceased .....	06	=> /END
Language difficulties .....	07	=> /END
No phone number .....	15	=> /END

### INT2

#### **Proxy end**

Thank you for your time, and have a good day/ afternoon/ evening.

Not at this number/ address.....	22	=> /END
Correct name & number - refused .....	23	=> /END

**INT3**

**Call back end**

Thank you. We will call back at <Date and Time >. Have a good day/ afternoon/ evening.

Correct name & number call back anytime ..... 20      => /END  
 Correct name & number specific call back..... 21      => /CB

**INT4**

**Web and proxy end**

I understand you do not wish to complete the survey over the phone. Would you prefer to complete the survey online?

Yes ..... 1      => WEB1  
 No ..... 23      => INT2  
 Refused ..... 23      => INT2

**WEB1**

**Web end**

To access the survey online, go to <http://www.survey.gov.bc.ca/logins/voterslist.htm> Once there, type in your personal and confidential survey password: < USERID >.

Correct name & number - refused ..... 23      => INT2

**Q1**

To confirm, is your name <Given Name> <Surname>?

Yes ..... 1      => Q2  
 No ..... 2      => Q1a  
 Refused ..... 3      => Q2

**Q1a**

You indicated that your name is not <Given Name> <Surname>, what is your correct name?

Given Name: \_\_\_\_\_  
 Surname: \_\_\_\_\_

Refused ..... 3      => Q2

**Q2**

Is your date of birth <Date of Birth >?

Yes ..... 1      => Q3  
 No ..... 2      => Q2a  
 Refused ..... 3      => Q3

**Q2a**

You indicated that your date of birth is not <Date of Birth >, what is your correct date of birth?

Year (YYYY): \_\_\_\_\_  
 Month (MM): \_\_\_\_\_  
 Day (DD): \_\_\_\_\_

Refused ..... 3      => Q3

**Q3**

**IF ANY ARE WRONG THEN CHOOSE "NO"**

Is your home address:

Unit Number  
 Building Number  
 Street Prefix (East, West, etc.)  
 Street Name  
 Street Type  
 Street Suffix (East, West, etc.)  
 City?

Yes ..... 1      => Q4  
 No ..... 2      => Q4a  
 Refused ..... 3      => Q4

**Q3a**

You indicated that the home address found in Elections BC's records is incorrect, what is your correct home address?

Unit Number: \_\_\_\_\_  
 Building Number: \_\_\_\_\_  
 Street Prefix (East, West, etc.): \_\_\_\_\_  
 Street Name: \_\_\_\_\_  
 Street Type: \_\_\_\_\_  
 Street Suffix (East, West, etc.): \_\_\_\_\_  
 City: \_\_\_\_\_

Refused ..... 3      => Q4

**Q4**

**IF ANY ARE WRONG THEN CHOOSE "NO"**

Is your current mailing address:

Mail Line 1  
 Mail Line 2  
 Mail City  
 Postal Code?

Yes ..... 1      => INT5  
 No ..... 2      => Q4a  
 Refused ..... 3      => INT5

**Q4a**

You indicated that the mailing address found in Elections BC's records is incorrect, what is your correct mailing address?

Mail Line 1: \_\_\_\_\_  
 Mail Line 2: \_\_\_\_\_  
 Mail City: \_\_\_\_\_  
 Postal Code: \_\_\_\_\_

Refused ..... 3      => Q5

**Q5**

According to Elections BC's records, there is/are <Number of Active Voters> voter(s) currently registered on the provincial voters list for your household. To the best of your knowledge, is this number accurate?

(Context: an eligible voter for the provincial voters list is considered to be anyone living in your household who is a Canadian citizen, is 18 years of age or older, and has lived in BC for the last 6 months. A registered voter is an eligible voter who is registered with EBC)

Yes ..... 1      => INT5  
 No ..... 2      => Q5a  
 Refused ..... 3      => INT5

**Q5a**

You indicated that there is a different number of voter(s), than <Number of Active Voters>, who is/are eligible to be on the provincial voters list. To the best of your knowledge, how many people currently live in your household who are a Canadian citizen, are 18 years of age or older, and have lived in B.C. for the last 6 months?

Number of Active Voters: \_\_\_\_\_

Refused ..... 3      => INT5

**INT5**

=&gt; INT if NOT (Q1=2 OR Q2=2 OR Q3=2 OR Q4=2)

**Completed with incorrect information end**

In preparation for the provincial election that will be on May 12<sup>th</sup>, 2009, Elections BC is also conducting a mail-out enumeration starting February 2nd, 2009. Any information that you provided through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

On behalf of Elections BC, I would like to thank you very much for your time today. The information you provided in this survey will be used both to assess the overall quality of the provincial voters list and to update your records within Elections BC's databases.

If you do not want this updated information to be shared with Elections BC, you must send a request to the Executive Director of BC Stats (Don McRae, PO Box 9410 Stn Prov Govt, Victoria, BC, V8W 9V1).

The request must be made in writing, signed and received by BC Stats no later than February 16, 2009, If you make this request, Elections BC will not be informed that your data were removed from the file.

If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to [www.elections.bc.ca](http://www.elections.bc.ca)

Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information incorrect ..... 24      => /END

**INT****End**

On behalf of Elections BC, I would like to thank you very much for your time today. If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to [www.elections.bc.ca](http://www.elections.bc.ca)  
Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information is correct (or refused).....	01	=> /END
Refused - would not confirm if it was the correct person .....	02	=> /END
Call-back no answer.....	03	=> /END
Line busy .....	04	=> /END
Not in service .....	05	=> /END
Deceased .....	06	=> /END
Language difficulties .....	07	=> /END
No phone number .....	15	=> /END

## APPENDIX V: MAIL SURVEY FORM (STANDARD)



**ELECTIONS BC**  
Province of British Columbia

Mailing Address:  
PO Box 9275 Stn Prov Govt  
Victoria BC V8W 9J6

Phone: 250-387-5305  
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448  
Fax: 250-387-3578  
Toll-free Fax: 1-866-466-0665  
Email: [electionsbc@elections.bc.ca](mailto:electionsbc@elections.bc.ca)  
Website: [www.elections.bc.ca](http://www.elections.bc.ca)

John/Jane Doe  
Street Address  
#123 - 456 7<sup>th</sup> St.

Small Town, BC, V1X 1X1

Month XX, 2008

Dear John/Jane Doe:

Elections BC needs your help. As the independent, non-partisan Office of the Legislature responsible for administering provincial elections and referendums, we need to ensure our voters list is up-to-date and accurate.

We are working with BC Stats, the Province's statistical agency, who is conducting this survey to determine the quality of the voters list. Your record on that voters list has been randomly selected for inclusion in this survey.

We need to know if your information on the enclosed survey is correct. Please respond using one of the following options:

1. answer the questions in the enclosed survey and return it in the pre-paid envelope; or
2. complete the on-line survey at: <http://www.survey.gov.bc.ca/logins/lqm.html>, using your confidential survey password: [12345678]; or
3. phone BC Stats, toll free, 1-888-274-1700.

Your response to this survey before February 10<sup>th</sup>, 2009 is important.

In preparation for the general election, Elections BC is also conducting a mail-out enumeration starting February 2nd, 2009. Any information that you provide through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

We understand the importance of protecting your personal information. Please know that both Elections BC and BC Stats take extreme care to ensure the information you give us in this survey is protected and not shared or used for any other purpose than to confirm your information on the voters list.

If you would like more information about this survey, please visit the Elections BC website at <http://www.elections.bc.ca/index.php/resource-center/surveys/>, or call Elections BC toll free at 1-800-661-8683.

Thank you for your help.

Sincerely,

A handwritten signature in black ink, appearing to read 'Harry Neufeld'.

Harry Neufeld  
Chief Electoral Officer





**ELECTIONS BC**  
Province of British Columbia

Mailing Address:  
PO Box 9275 Stn Prov Govt  
Victoria BC V8W 9J6

Phone: 250-387-5305  
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448  
Fax: 250-387-3578  
Toll-free Fax: 1-866-466-0665

Email: electionsbc@elections.bc.ca  
Website: www.elections.bc.ca

**Important - Please complete and return to BC Stats no later than February 10th, 2009**

**Thank you!**

**Your information on the provincial voters list is:**

**Name:** John/Jane Doe

**Date of Birth:** 1950-01-01  
(yyyy-mm-dd)

**Home Address:** #123-4567<sup>th</sup> St. Small Town, BC, V1X 1X1

1. Is the **name** correct?

Yes  No



What is your correct **name**?



First Name:

\_\_\_\_\_

Last Name:

\_\_\_\_\_

2. Is the **date of birth** correct?

Yes  No



What is your correct **date of birth**?



Year (YYYY): \_\_\_\_\_

Month (MM): \_\_\_\_\_ Day (DD): \_\_\_\_\_

3. Is the **home address** correct for where you live?

Yes  No



What is the correct **home address** for where you live  
(Please don't provide a postal address)?



Apartment, Unit, Pad Number: \_\_\_\_\_

House or Building Number: \_\_\_\_\_

Street Name: \_\_\_\_\_

Street Type (Avenue, Street, etc.): \_\_\_\_\_

Street Direction (North, East, etc.): \_\_\_\_\_

City or Town: \_\_\_\_\_

---

**Thank you for completing this survey.**

If you have any questions or concerns regarding this survey, please contact Elections BC toll-free at 1-800-661-8683 or through Elections BC's website at [www.elections.bc.ca](http://www.elections.bc.ca).

If you decide that you do not want BC Stats to pass along your updates to Elections BC, you must send a request to the Executive Director of BC Stats. The request must be made in writing, signed, and received by BC Stats no later than February 16, 2009. Elections BC will not be informed that you submitted a request. Either include the request in the prepaid envelope or mail it to BC Stats, Box 9410 Stn Prov Govt, Victoria, BC V8W 9V1.

## APPENDIX VI: MAIL SURVEY FORM (STACKED ADDRESS)



**ELECTIONS BC**  
Province of British Columbia

Mailing Address:  
PO Box 9275 Stn Prov Govt  
Victoria BC V8W 9J6

Phone: 250-387-5305  
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448  
Fax: 250-387-3578  
Toll-free Fax: 1-866-466-0665

Email: [electionsbc@elections.bc.ca](mailto:electionsbc@elections.bc.ca)  
Website: [www.elections.bc.ca](http://www.elections.bc.ca)

John/Jane Doe  
Street Address  
#123 - 456 7<sup>th</sup> St.

Small Town, BC, V1X 1X1

Month XX, 2008

Dear John/Jane Doe:

Elections BC needs your help. As the independent, non-partisan Office of the Legislature responsible for administering provincial elections and referendums, we need to ensure our voters list is up-to-date and accurate.

We are working with BC Stats, the Province's statistical agency, who is conducting this survey to determine the quality of the voters list. Your record on that voters list has been randomly selected for inclusion in this survey.

We need to know if your information on the enclosed survey is correct. Please respond using one of the following options:

4. answer the questions in the enclosed survey and return it in the pre-paid envelope; or
5. complete the on-line survey at: <http://www.survey.gov.bc.ca/logins/lqm.html>, using your confidential survey password: [12345678]; or
6. phone BC Stats, toll free, 1-888-274-1700.

Your response to this survey before February 10<sup>th</sup>, 2009 is important.

In preparation for the general election, Elections BC is also conducting a mail-out enumeration starting February 2<sup>nd</sup>, 2009. Any information that you provide through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

We understand the importance of protecting your personal information. Please know that both Elections BC and BC Stats take extreme care to ensure the information you give us in this survey is protected and not shared or used for any other purpose than to confirm your information on the voters list.

If you would like more information about this survey, please visit the Elections BC website at <http://www.elections.bc.ca/index.php/resource-center/surveys/>, or call Elections BC toll free at 1-800-661-8683.

Thank you for your help.

Sincerely,

Harry Neufeld  
Chief Electoral Officer



**ELECTIONS BC**  
Province of British Columbia

Mailing Address:  
PO Box 9275 Stn Prov Govt  
Victoria BC V8W 9J6

Phone: 250-387-5305  
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448  
Fax: 250-387-3578  
Toll-free Fax: 1-866-466-0665  
Email: electionsbc@elections.bc.ca  
Website: www.elections.bc.ca

**Important - Please complete and return to BC Stats no later than February 10th, 2009**

**Thank you!**

**Your information on the provincial voters list is:**

**Name:** John/Jane Doe

**Date of Birth:** 1950-01-01  
(yyyy-mm-dd)

**Home Address:** #123-4567<sup>th</sup> St. Small Town, BC, V1X 1X1

4. Is the **name** correct?

Yes  No



What is your correct **name**?



First Name:

\_\_\_\_\_

Last Name:

\_\_\_\_\_

5. Is the **date of birth** correct?

Yes  No



What is your correct **date of birth**?



Year (YYYY): \_\_\_\_\_

Month (MM): \_\_\_\_\_ Day (DD): \_\_\_\_\_

6. Is the **home address** correct for where you live?

Yes  No



What is the correct **home address** for where you live?  
(Please don't provide a postal address)

Apartment, Unit, Pad Number: \_\_\_\_\_

House or Building Number: \_\_\_\_\_

Street Name: \_\_\_\_\_

Street Type (Avenue, Street, etc.): \_\_\_\_\_

Street Direction (North, East, etc.): \_\_\_\_\_

City or Town: \_\_\_\_\_

7. Elections BC's records indicate there are X **registered voters** currently living in your household. Is this correct?

Yes  No



How many people currently live in your household who are a Canadian citizen, are 18 years of age or older, and have lived in B.C. for the last 6 months?

Number of people: \_\_\_\_\_

---

### Thank you for completing this survey.

If you have any questions or concerns regarding this survey, please contact Elections BC toll-free at 1-800-661-8683 or through Elections BC's website at [www.elections.bc.ca](http://www.elections.bc.ca).

If you decide that you do not want BC Stats to pass along your updates to Elections BC, you must send a request to the Executive Director of BC Stats). The request must be made in writing, signed, and received by BC Stats no later than February 16, 2009. Elections BC will not be informed that you submitted a request. Either include the request in the pre-paid envelope or mail it to BC Stats, Box 9410 Stn Prov Govt, Victoria, BC, V8W

9

## APPENDIX VII: INTRODUCTORY LETTER



**ELECTIONS BC**  
Province of British Columbia

Mailing Address:  
PO Box 9275 Stn Prov Govt  
Victoria BC V8W 9J6

Phone: 250-387-5305  
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448  
Fax: 250-387-3578  
Toll-free Fax: 1-866-466-0665

Email: electionsbc@elections.bc.ca  
Website: www.elections.bc.ca

John/Jane Doe  
#123 - 456 7<sup>th</sup> St.  
Small Town, BC, V1X 1X1

**Home Address:**  
#123 - 456 7<sup>th</sup> St.  
Small Town, BC, V1X 1X1

**Personal and Confidential**

January 23, 2009

Dear John/Jane Doe

Elections BC needs your help. As the independent, non-partisan Office of the Legislature responsible for administering provincial elections and referendums, we need to ensure the provincial voters list is up-to-date and accurate.

We are working with BC Stats, the Province's statistical agency, who is conducting a survey to determine the quality of the voters list. Your record on the voters list has been randomly selected for inclusion in this survey.

Between January 27 and February 10, 2009, you will be contacted either by phone or Xpresspost mail. You will be asked to confirm your name, date of birth and home address as it appears on the voters list. If the information is incorrect, you will also be asked to provide the correct information. If you have not been contacted by February 10<sup>th</sup>, 2009, please call BC Stats, toll free, at 1-888-274-1700.

In preparation for the general election, Elections BC is also conducting a mail-out enumeration starting February 2<sup>nd</sup>, 2009. Any information that you provide through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

We understand the importance of protecting your personal information. Please know that both Elections BC and BC Stats take extreme care to ensure the information you give us in this survey is protected and not shared or used for any other purpose than to confirm your information on the voters list.

The information you provide is important and will help us to maintain an accurate voters list. If you would like more information about this survey, please visit the Elections BC website at <http://www.elections.bc.ca/index.php/resource-center/surveys/>, or call Elections BC toll free at 1-800-661-8683.

Thank you for your help.

Sincerely,

Harry Neufeld  
Chief Electoral Officer

## APPENDIX VIII: PHONE SOURCING METHODOLOGY

The following methodology has been provided by the vendor responsible for phone sourcing – ASDE Survey Sampler.

### Automated List Matching

1. Client list is received in any fixed format: Excel, Access, dbf, text, etc.
2. Fields are standardized to match the phone book database format used by ASDE.
3. List is run through the system to look for matches on 25 different combinations of fields and information: from full match of full name and address to match of surname to Postal code, therefore those 2 fields are the most important ones for any list matching success.
4. The system applies weights to various fields of a record and matches them uses those weights to determine if the record is considered acceptable or not.
5. A visual check is conducted to remove multiple numbers resulting from one record. This is included in the standard pricing.
6. The initial list is returned to the client as received with an extra column with the phone number as found in ASDE's database.
7. Match rates vary between 40%-60% depending on various attributes such as the quality and up-to-date status of the list. Due to spelling and other such variables, this can never be a complete process.

### Manual List Matching

Following the process above, ASDE employees look up each record one by one using Canada 411 online. This human one on one judgment factor cannot be obtained in an automated way and means that client can expect up to 80% matches. It also allows for capturing spelling errors in street names or addresses

Each record goes through 4-5 passes before it is abandoned:

1. street # - address - city - province
2. address - city - province
3. address - postal code - province
4. surname -partial address- FSA
5. surname - city - province

ASDE normally considers it a match if the record is found to have:

- The same family name, regardless of the address, in the same city (as long as no other listings with the same family name appear in that city).

- The same family name, with a matching first name, regardless of the address, in the same city, unless there are multiple listings of that combination of first and last name.
- A different name, but the correct address (ASDE assume here that the 'name' on the client's list lives with the 'different name' of the telephone directory at the correct address.)