



Methodology for the Ballot Paper Assurance Sampling Process for the 2025 Federal Election

The table below provides a high-level overview of the Service Provider's methodology for performing independent statistical assurance of the Senate ballot papers throughout the conduct of scrutiny of Senate votes at the Central Senate Scrutiny (CSS) sites for the 2025 federal election.

Methodology Component	Description
Determination of the required sampling volume for assurance	<p>Section 273AC of the <i>Commonwealth Electoral Act 1918</i> requires the sampling of ballot papers to assure the accuracy of the computerised scrutiny process. It mandates that these sampled ballot papers be verified against the computerised records, ensuring transparency and supporting the integrity and trustworthiness of this element of the electoral process in Australia.</p> <p>The Australian Electoral Commission (AEC) has received advice from the Australian Bureau of Statistics (ABS) on the suggested rates of assurance by state or territory to ensure the results are statistically significant. The ABS recommends that Senate ballot papers should be assured at the following rate:¹</p> <ul style="list-style-type: none">• 1 in 3,000 ballot papers in New South Wales• 1 in 3,000 ballot papers in Victoria• 1 in 2,500 ballot papers in Queensland• 1 in 1,250 ballot papers in Western Australia• 1 in 1,000 ballot papers in South Australia• 1 in 350 ballot papers in Tasmania• 1 in 300 ballot papers in Australian Capital Territory• 1 in 120 ballot papers in Northern Territory <p>The Service Provider has adjusted the actual total ballot papers from the 2022 federal election to allow for population growth, to determine the estimated minimum required sampling volumes of Senate ballot papers for the 2025 federal election based on the ABS assurance rates.</p> <p>The AEC has confirmed the samples must be large enough to enable at least 99.5% confidence that, if the true population error rate is 0.45% (which was the observed sample error rate for the 2022 federal election), the observed sample error rate will be less than 1%.¹ The Service Provider's determined sample is appropriate to enable this rate of confidence.</p> <p>The ABS advice represents an adequate sampling volume for statistical sufficiency based on the AEC's required confidence interval for the assessment of the true error rate. Refer also to Appendix A: Minimum sampling volume by Central Senate Scrutiny site.</p>

¹ ABS advice to AEC on sampling methodology, (November 2021, and revalidated by ABS in September 2024).



Methodology Component	Description
<p>Practical implementation of assurance through cluster selection of ballot papers within selected BPTCs</p>	<p>To facilitate ballot transportation and the AEC Central Senate Scrutiny (CSS) process, the AEC collates ballot papers into batches of 50. Batches are stored, transported and processed in Ballot Paper Transport Containers (BPTC), with up to 10 batches of ballot papers contained within a single BPTC.</p> <p>Consistent with ABS advice to the AEC, the Service Provider is utilising “clustered sampling” of ballot papers.²</p> <p>The Service Provider will randomly select three batches within each selected BPTC. For each selected batch, the Service Provider will then select five ballot papers.</p>
<p>Approach for selecting BPTCs for assurance testing</p>	<p>The Service Provider will be selecting the following number of BPTCs in each state or territory to achieve the minimum sampling volume based on the cluster sampling approach:</p> <ul style="list-style-type: none"> • 118 BPTCs in New South Wales • 94 BPTCs in Victoria • 88 BPTCs in Queensland • 91 BPTCs in Western Australia • 87 BPTCs in South Australia • 77 BPTCs in Tasmania • 70 BPTCs in Australian Capital Territory • 64 BPTCs in Northern Territory <p>The Service Provider will develop a random BPTC selection schedule for each CSS site based on the following variables:</p> <ul style="list-style-type: none"> • Distribution of the required number of BPTCs across the number of scanners at each CSS site. • Distribution of the required number of BPTCs by the scanning provider’s projected scanning shifts to provide representative sampling across shifts. <p>At the times and dates pre-determined by the BPTC selection schedule, the Service Provider will select BPTCs being scanned by the scanning provider and mark them for assurance testing. The scanning provider and AEC staff will not be informed of the selection schedule and will not know which BPTCs are going to be sampled until after the scanning has been completed. The selected BPTCs will be tested by the Service Provider before being returned to the scanning provider for storage.</p>
<p>Testing approach</p>	<p>For each sampled ballot paper, the Service Provider will conduct a two-stage testing process to validate the consistency of information between the physical Senate ballot paper and AEC’s system:</p> <ul style="list-style-type: none"> • Stage 1 test: does the selected ballot paper match the scanned image in AEC’s system?

² ABS advice to AEC on sampling methodology, (November 2021, and revalidated by ABS in September 2024).



Methodology Component	Description
	<ul style="list-style-type: none">• Stage 2 test: do the preferences on the physical ballot paper reconcile with electronic preference data recorded on the corresponding Ballot Paper Details page in AEC's system? <p>All potential exceptions will be escalated to, and reviewed by, the Service Provider's Assurance Lead.</p>
Quality assurance	<p>Quality assurance will be conducted by the Service Provider through simultaneous, independent performance of assurance testing of a sub-sample of ballot papers. Independent quality assurance checks will be performed on at least one ballot paper from every selected BPTC.</p> <p>Following on-site quality assurance, all potential exceptions will also be reviewed by the Service Provider's Assurance Lead.</p>
Reporting overall assurance outcomes	<p>Following completion of testing, the Service Provider will report the following statistical conclusions drawn from the assurance testing results:</p> <ul style="list-style-type: none">• The observed proportion of errors in the sample for each state and territory, and nationally.• An estimate of a range in which the true error rate lies for each stratum (state or territory, national) from which the sample is taken, for the indicated confidence level.• A statement regarding the true population error rate based on the results of assurance testing.



Appendix A: Minimum sampling volume by Central Senate Scrutiny site

The Service Provider has used the ABS advice to the AEC on the sampling methodology, adjusted for the actual total ballot papers from the 2022 Senate Election to allow for population growth, and determined the estimated minimum required sampling volumes of Senate ballot papers for the 2025 federal election.¹

The total national sample is estimated to be at least 10,299 ballot papers. The estimated total national sample is more than double volume required under Section 273AC.³

Table 1: Minimum sampling volume by CSS site

CSS site	Estimated Ballot Papers for 2025 federal election	Minimum sampling volume by CSS site
New South Wales	5,300,000	1,767
Victoria	4,200,000	1,400
Queensland	3,300,000	1,320
Western Australia	1,700,000	1,360
South Australia	1,300,000	1,300
Tasmania	400,000	1,143
Australian Capital Territory	315,000	1,050
Northern Territory	115,000	959
	TOTAL	10,299

³ Under subsection (3) of Section 273AC of the *Commonwealth Electoral Act 1918*, “The [Electoral Commissioner](#) must ensure that: (a) if the [election](#) was held concurrently with a general [election](#) for the House of Representatives—at least 5,000 ballot papers in total are checked under [subsection](#) (2) throughout the scrutiny of votes for the [election](#) and for the other Senate [elections](#) that were held concurrently with that general [election](#)”.