



STATE OF MICHIGAN
BUREAU OF ELECTIONS
LANSING

MEMORANDUM

DATE: March 14, 2023
TO: Board of State Canvassers
FROM: Jonathan Brater, Director of Elections
SUBJECT: Petition Validation and Sampling Process

I. Overview

Under the Michigan Election Law, the Board of State Canvassers (Board) is responsible for canvassing signatures for statewide ballot questions. The Bureau of Elections (Bureau) assists the Board in the responsibility by reviewing petition signatures and producing a staff report for the Board's review. In calendar year 2022, the Bureau received seven filed statewide ballot question petitions, which included a total of well over 2 million signatures. On behalf of the Board, Bureau staff canvasses these petitions using the random sampling procedure adopted by the Board.

Throughout the 2022 election cycle, the Bureau received numerous questions from the public and members of the Board regarding the petition canvassing process – including the random sampling process, procedures, and methodology. In response to these questions, and in light of the fact that the methodology has not been reviewed in many years, the Bureau engaged the Rehmann Group to consult on and make recommendations for improvements, if applicable, to the Board for improvements to the process and methodology. Rehmann's findings are enclosed with this memorandum.

This memorandum explains the current sampling process and provides an overview of the recommended changes to the process, including the possibility of expanding the use of sampling to statewide candidate petitions.

II. Existing Petition Process

On February 7, 1980, the Board adopted a sampling procedure for canvassing petitions seeking an initiative, referendum, or state constitutional amendment. That procedure was adopted before the development of the state Qualified Voter File (QVF). It includes multiple stages of sorting and reviewing petition sheets and signatures, including an initial "face review" of petition sheet. The Face Review is followed by a random sample of a representative portion of the total "universe" of signatures. Signatures within the sample are examined to confirm that the signatory is a person registered to vote in Michigan and that the signature on the petition sheet matches the signature contained in the QVF. Based on a statistical formula approved by the Board, the number of signatures out of the sample confirmed to be valid determines whether staff recommends the petition be approved or rejected for certification by the Board. In rare instances, the number of valid signatures fall into a span between the

statistically determined acceptance and rejection thresholds. When this occurs, it triggers a second, larger signature sample to increase the precision of the sample and the accuracy of the results. In 1990, the process underwent a review which validated the statistical methods used for the previous ten years. No known review of the process has been presented to the Board since that time. There is currently no sampling procedure used for candidate nominating petitions.

Face Review

Face review involves checking that the mandatory elements of each petition sheet are present and correct, which is also done for candidate nominating petitions.¹ Sheets that do not pass face review are removed from the “universe” of sheets and signatures considered in the filing because every signature on the sheet is invalid.²

This step of the process alone is extremely time-consuming and burdensome for staff; it accounts for nearly 66 percent of the 60-day process. For example, in two statewide petition filings in 2022, staff spent approximately 2,500 personnel hours over 14 business days to conduct face review of two statewide petitions.

Counting Signatures and Numbering Sheets

After face review, staff count the total number of potentially valid signatures on all remaining sheets and stamp an identifying number on each sheet. To count the total number of signatures, staff sorts each petition sheet into batches based on the number of signatures on each sheet and counts the number of sheets in each batch. Then staff totals the number of sheets in each batch, multiplied by the number of signatures per sheet, to determine the total signature count. After this sorting process is complete, staff “shuffles” the sheets in each batch to “un-sort” them in an effort to ensure randomization of the filing before stamping. This step accounts for nearly 25 percent of the 60-day-process and took staff approximately 463 personnel hours over 5 business days.

Random Sampling Process

After face review, counting of signatures and sheets, and numbering of sheets, staff begin the two-step random sampling process. A sample of approximately 500 signatures is randomly selected from the remaining potentially valid signatures. Each of those signatures is examined to confirm that the signatory is a person registered to vote in Michigan, that the signature on the petition sheet matches the signature contained in the (QVF), and that the entry does not contain another fatal defect (for instance, a jurisdiction, date, or address error). Each of the signatures in the sample is determined to be either a valid signature (the genuine signature of a person registered to vote in Michigan that matches the information in QVF) or an invalid signature (because the person who signed the petition sheet is not registered to vote in Michigan, the signature did not match the person’s signature stored in the QVF, or for another fatal defect). Finally, staff tallies the number of signatures in the sample which are valid.

¹ Mandatory elements include ensuring that the paid or volunteer checkbox is completed, that the circulator certificate is properly completed, and the petition is on the proper form and does not cover up warning statements. For more information, see memorandum on Petition Process Review and Coding Updates.

² Staff also remove sheets if every signature affixed to the sheet is obviously invalid for reasons specific to each signature, not the sheet as a whole (for example, if every signature line omitted the date, city, or some other mandatory element).

When selecting and checking the validity of the approximately 500-signature sample during the first step of the sampling process, staff use a computer software program to provide a randomly generated list of sheets and lines.³ A statistical methodology approved by the Board of State Canvassers is used to calculate two thresholds based on the number of valid signatures in the sample: a “rejection” threshold and an “acceptance” threshold. The rejection and acceptance threshold are not the same. The rejection threshold is usually fifteen to thirty signatures lower than the acceptance threshold.

To complete the first step of the canvassing process, staff compare the number of valid signatures in the sample to the rejection and acceptance thresholds. If the number of valid signatures in the sample is equal to or greater than the acceptance threshold, staff recommend that the Board certify the subject of the petition to the ballot. If the number of valid signatures in the sample is lower than or equal to the rejection threshold, staff recommend that the Board decline to certify the subject of the petition to the ballot. If the number of valid signatures in the sample is greater than the rejection threshold, but lower than the acceptance threshold, staff move to the second step of the canvassing process.

The second and final step of the petition canvassing process is employed only when the number of valid signatures fall into the span between the acceptance and rejection thresholds—the “pull more” range. This step is similar to the first step, except that staff uses the same approved methodology to randomly sample approximately 2,000 signatures, and staff calculate a single combined acceptance and rejection threshold (without a “pull more” range). The larger sample of newly drawn signatures is combined with approximately 500 signatures in the original sample to yield a combined sample of approximately 2,500 signatures.

Staff determines how many signatures in the combined sample are valid and compare the number of valid signatures to the acceptance/rejection threshold. If the number of valid signatures in this larger random sample is greater than or equal to the computed acceptance/rejection threshold, staff recommends that the Board certify the subject of the petition to the ballot. If the number of valid signatures in the sample is lower than the acceptance/rejection threshold, staff recommends that the Board decline to certify the subject of the petition to the ballot. This second step, which is usually not required, is used by the Board in its established procedures to obtain a more precise estimate of valid signatures, based on a larger sample size, in cases of close calls—where an initiative fails to reach the acceptance threshold by a small margin. Although even a small margin in the sample would likely yield the correct result when extrapolated to the “universe” of submitted signatures, the second step is an additional safeguard used to increase the precision of the sample and the accuracy of the result.

³ The sample is always at least 500 signatures but may not be exactly 500 signatures because staff requests the computer program initially pull more than 500 sheets and lines. This is necessary based on staff’s expectation based on experience that some identified lines will be blank and that additional sheet and lines will be needed to complete the sample. For example, the computer program may identify 800 sheets and lines because staff anticipate that approximately 300 will be blank, but in fact only 250 turn out to be blank, leaving a sample of 550 signatures.

III. Review by the Rehmann Group

In order to maintain or improve the statistical quality of the process, find efficiencies in the petition process, and allow the Board an opportunity to review and approve any recommended changes to the petition validation and canvass process, the Bureau contracted with Rehmann Group, a financial services and business advisory firm, to review and statistically analyze the state’s process for improvements and efficiencies, while improving or maintaining statistical accuracy. Overall, Rehmann concluded that the sampling paper reviewed in 1990 is still fundamentally sound, and that an addendum of the existing process for 2023 would suffice to improve the process.

In addition to reviewing the sampling methodology, Rehmann examined the face review process, the process of pulling the sample, and the one-stage sample versus the two-stage sample. The results of Rehmann’s review has been published in the attached report.

Face Review

Rehmann concluded that the face review process is time-consuming and does not statistically affect the results of sampling. Rehmann conducted simulations on a hypothetical petition utilizing data from several 2022 petitions filed with the Bureau. Rehmann simulated the results by drawing samples from a face-reviewed petition and a non-face-reviewed petition filing. The results of the simulations concluded that the confidence factor and margin of error were identical in each case, and the differences in results between the face-reviewed and non-face reviewed petitions varied by statistically insignificant amounts.

Based on this conclusion, Rehmann concluded that eliminating the face review process will not negatively impact the accuracy of sampling but would result in significant administrative time-saving measures for staff.

Sample Selection Process

Currently, when determining the sample, the program prints “call sheets” which provide a specific line on a specific sheet:

| | | | | | | | |
|-------|-----|------|---|-------|-----|------|---|
| SHEET | 94 | SIG. | 4 | SHEET | 99 | SIG. | 7 |
| SHEET | 204 | SIG. | 1 | SHEET | 256 | SIG. | 1 |
| SHEET | 395 | SIG. | 1 | SHEET | 406 | SIG. | 8 |

As a result of the randomization into batches (described above), this may result in a significant number of “misses” or sheets where there is no signature on that line.

Rehmann reviewed this process and determined that there is no statistical advantage to shuffling the sheets and pulling the sample in this manner. Rather, Rehmann recommended selecting the “4th Signature” rather than the signature on line four (and no longer shuffling the petitions). Rehmann concluded that these changes would result in a faster sample selection process.

One-stage Sample vs. Two-stage Sample

The original sample report outlined two sampling procedures that are employed by staff when sampling. Plan A (one-stage sampling) resulted in larger sample sizes but required only a single draw. Plan B (two-stage sampling) allowed for a smaller initial draw of approximately 500 signatures, with the *potential* need for a second (and possibly much larger) draw depending on the results of the initial sample.

Typically, the Bureau starts with an initial 500 signature sample, but in recent years has had to pull larger samples or review additional signatures either because the statistical methodology as applied to the results of the sample required staff to pull more, or because the Board requested staff review additional signatures. For a 90 percent confidence factor, the margin of error was approximately ± 4.3 percent, although in Rehmann's simulations, the margin of error was actually closer to ± 3.2 percent.

Rehmann found that eliminating the two-stage review process in favor of gathering a larger, initial sample would create an efficiency without negatively impacting the current 90 percent confidence factor. Larger sample sizes hit a confidence factor of 90% with a lower margin of error.

| Sample Size | Margin of Error for 90% Confidence |
|-------------|------------------------------------|
| 500 | 3.2% |
| 750 | 2.6% |
| 1000 | 2.3% |
| 1500 | 1.8% |
| 2000 | 1.6% |
| 2500 | 1.4% |

In the past, in instances where a second, larger sample had to be pulled, an extreme burden was placed onto staff, sponsors, and challengers because it left very little time in the calendar. Rehmann concluded that there were significant administrative time savings by drawing a larger sample immediately, and that coupled with the time savings of eliminating the face review and shuffling processes, the additional time to review the increased signatures would be offset.

Expansion of the Sampling Process to Statewide Candidate Petitions

As part of the review, staff asked Rehmann to examine whether the sampling process currently used for statewide initiative petitions could be expanded for use in statewide candidate petitions. The expansion would cover partisan candidates filing petitions for the offices of Governor/Lieutenant Governor and United States Senator as well as candidates without party affiliation filing petitions for the offices of Governor/Lieutenant Governor, Secretary of State, Attorney General, United States Senator, Member of the State Board of Education, Regent of the University of Michigan, Trustee of Michigan State University, Governor of Wayne State University, and Justice of the Michigan Supreme Court.

Under the Michigan Election Law, partisan candidates may submit up to 30,000 signatures and candidates without party affiliation may submit up to 60,000 signatures. MCL 168.544f.⁴ Staff conducts

⁴ Partisan candidates must submit a minimum of 15,000 valid signatures under the Michigan Election Law; pursuant to *Graveline v. Benson*, 992 F.3d 524 (6th Cir 2021), candidates without party affiliation must submit a minimum of 12,000 valid signatures.

an initial face review of the entire filing to determine ballot eligibility, and processes any challenges submitted pursuant to MCL 168.552.

In the past after the initial face review, Bureau staff did not need to expend a great amount of time reviewing individual signatures on candidate nominating petitions, aside from signatures that were challenged or a relatively low number of signatures of dubious authenticity scattered throughout petitions. However, this changed in 2022 when the Bureau received approximately 70,000 fraudulent signatures submitted by a number of petition circulators across 10 different petitions. Staff spent hundreds of hours attempting to validate signatures. In reality, given the volume of filings, it was not possible to look up each and every signature submitted by the fraudulent petition circulators to individually verify that each and every signature was fraudulent, although all of the signatures reviewed were fraudulent.

In its review, Rehmann concluded that the sampling process, with the changes recommended in this memo, could be further utilized with candidate petitions exception with the drawing of a smaller sample. To achieve the same ± 2.3 percent margin of error at a 90 percent confidence factor utilized in statewide initiative petition filings, Rehmann concluded that a sample of 750 signatures could be drawn on a filing of 30,000. Notably, although the expected confidence factor and margin of error would be similar to petition filings, in the case of candidate petitions a much larger percentage of signatures in the overall petition filing would be sampled—750 would be approximately 2.5 percent of the signatures in a filing of 30,000, as opposed to 1,000 being approximately 0.2 percent in a filing of 500,000.

By utilizing the sampling process in statewide candidate petition filings, staff can better assess signature accuracy and detect fraud with a more efficient process. To whatever extent invalid signatures were submitted as part of candidate nominating petitions—whether through circulator fraud or invalid signatures that the circulators did not know were invalid— these signatures would be reflected in the representative sample and inform the Bureau's recommendation to the Board on whether or not to certify. This would, in turn, provide greater confidence as the valid number of signatures contained within the filing.

IV. Recommended Changes to the Sampling Process

After reviewing the report, staff recommends the Board do the following:

1. Approve the changes to the sampling method as described within this memorandum and recommended by Rehmann in the attached report. This includes:
 - a. Eliminating face review prior to sampling;
 - b. Eliminate shuffling of the petition sheets;
 - c. When pulling a sampled signature, gathering the signature corresponding to numerical position rather than line number;
 - d. Eliminating the two-stage sample process in favor of a one-stage, larger sample;
 - e. Replace the current software program used to identify and pull signatures with a Visual Basic for Applications.
2. Adopt the same sampling procedure utilized for statewide initiative petitions for use in statewide candidate petitions with a minimum required valid signature threshold of 15,000 (with a sample size of 750).

3. Adopt the signature validity codes recommended in the memorandum on Petition Process Review and Coding Updates and corresponding manual.