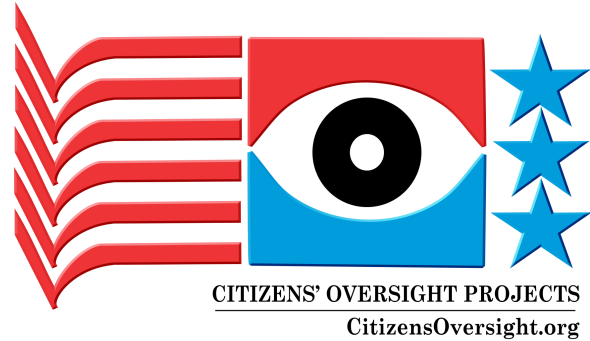


Ray Lutz, Executive Director
CitizensOversight, Inc.
771 Jamacha Rd 148
El Cajon, CA 92019
raylutz@citizenoversight.org
619-820-5321



Dec. 2, 2023

Al Schmidt, Pennsylvania Secretary of State
401 North Street, Rm 210
Harrisburg, PA 17120
(717) 787-5280
RA-Elections@pa.gov



REF: M2003

Christopher Commini, Registrar
County of Northampton
Office of Elections and Voter Registration
669 Washington St., Lower Level
Easton, PA 18042

Phone: (610) 829-6260
email: elections@norcopa.gov

Re: Voting Machine Errors in Northampton County

Greetings:

We are contacting you today regarding the voting machine errors in the recent election in Northampton County¹.

Our organization has developed a ballot image auditing platform "AuditEngine"² which we believe can be helpful in fully diagnosing the error encountered.

¹

<https://www.lehighvalleynews.com/elections/election-2023-widespread-voting-machine-problems-reported-in-northampton-county>

² <https://auditengine.org>

AuditEngine has the ability to process all ballot images in the election, including all ExpressVote XL (EVXL) ballots, and it can "read" the human readable text as well as convert all barcodes. We don't know of any other way to easily fully analyze this error on all ballots cast.

We have recently conducted a public oversight audit in Monmouth County, NJ, which also uses ES&S ExpressVote XL machines³. So we are intimately aware of many of the issues with these machines.

AuditEngine doesn't rely on the barcodes in its evaluation of the vote, and instead reads the voter-verifiable text. This is particularly true in the case of the ExpressVote XL, because ES&S uses a different barcode encoding scheme⁴ than the normal x,y coordinate system in the ES&S ExpressVote and DS200 combination. For this reason, the ExpressVote XL is even more problematic in terms of the barcodes, because without prior knowledge, it is not possible to reliably predict the barcode encoding, making it even less voter-verifiable than normal barcodes, which already are virtually impossible to verify.

In PA, we understand that ballot images and cast vote records have been ruled by the court as not being available as public records. However, certainly the law against revealing the contents of the ballot box can allow service providers, such as ourselves, to analyze this election, perhaps under a non-disclosure agreement.

It is our opinion after working through many audits that the law in PA is overreaching, because ballot images are essentially anonymous and do not reveal how any particular voter voted. Nevertheless, we can work under an

³ In this case, our platform was able to detect 977 repeated ballot images and CVR records that were mistakenly uploaded when six USB thumb drives were uploaded twice. We also found several other contests that were inaccurately counted. Monmouth County hand counted many of the contests and one was found to have flipped due to the incorrect uploads. Also, we found three other contests that were inaccurate for other reasons, one that was hand counted. The hand counts were within +/-3 votes from our evaluation. See this report for all information:

<https://docs.google.com/document/d/1HhAfiGIhEQUIHpyChl0uJORUmymGAZq9thdPMbKuG/Xs/edit?usp=sharing>

⁴ The barcode encoding scheme in the ExpressVote XL is provided here:

<https://docs.google.com/document/d/1HhAfiGIhEQUIHpyChl0uJORUmymGAZq9thdPMbKuG/Xs/edit#heading=h.5xgsdceriqg9>

NDA if that is required.

In this case, we believe we understand the root cause of this error in Northampton County PA, and we have a set of suggestions to avoid this and other configuration errors in the future. **Those recommendations are provided in the Appendix.**

We recommend that the suggestions are put into place immediately. Implementing rules 5 and 7 would have probably avoided the configuration error in Northampton County, based on our initial review.

These improvements in the consistency and clarity in how any election is defined in terms of the contest and option names can also help us perform ballot image audits (BIAs) if you decide those are a smart choice for PA.

We want to suggest that PA entertain allowing ballot image audits to allow detailed retabulation of the election with ballot-by-ballot comparison with the official results, as we perform with AuditEngine. We are now completing a Pilot Audit in the state of Maryland, and we have completed public-oversight audits in Florida, Georgia, New Jersey, Texas, and Wisconsin.

It is our goal to audit all elections, all contests and all ballots.

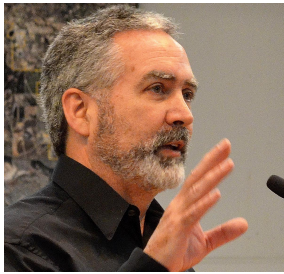
To move forward, I suggest that PA engage our services for this Northampton County election. We are willing to sign an NDA. Please contact me for further discussion.

Sincerely,

Ray Lutz

A handwritten signature in black ink, appearing to read 'Ray Lutz', with a stylized flourish extending to the right.

Citizens' Oversight Projects
citizenoversight.org



Raymond Lutz is the founder and executive director of Citizens' Oversight Projects, a 501(c)3 nonpartisan nonprofit organization that has been involved in providing oversight to elections for over 15 years. Lutz has a Masters degree in electronics and software engineering, with experience in the document management and printer/scanner/fax/copier industry, and medical device industry. He is the lead developer of AuditEngine.

CC:

Northampton County Executive Lamont McClure

LMcClure@northamptoncounty.org

Members of the Lower Saucon Township Council

Jason Banonis, Council President -- jbانونis@lowersaucontownship.org

Mark Inglis, Council Vice President -- minglis@lowersaucontownship.org

Thomas Carocci, Council Member -- tcarocci@lowersaucontownship.org

Priscilla deLeon, Council Member -- pdeleon@lowersaucontownship.org

Sandra Yerger, Council Member -- syerger@lowersaucontownship.org

APPENDIX

AVOID CONFIGURATION ERRORS AND ENABLE IMAGE AUDITS

To expedite configuration of AuditEngine for ballot image audits, improve voter verifiability, and to avoid configuration errors, please follow these recommendations. These can be incorporated immediately in any voting systems and avoid human errors during configuration, make it easier to verify votes, and enable ballot image auditing.

1. **Naming Consistency.** Be consistent as much as possible between cast-vote record (CVR, i.e. official contest and option names), hand-marked ballot, and ballot marking device (BMD) representations, for contest names and option names. Use consistent names in state-wide contests among all counties.
2. **Concise.** Use shorter contest names and avoid long names, like "United States House of Representatives in the 119th Congress, District 38 in the state of Pennsylvania." Instead use: "**US House, PA-38**".
3. **Consistent Conversions are okay.** If there are any differences between contest names in different formats, use as simple substitutions, such as "**(38A)**" becomes "**District 38A**", and try to be consistent among all contests, i.e., District 38A, District 38B, District 39.
4. **Avoid duplicate contest names.** All contest names should be unique county- and state-wide. Instead of "Mayor", use "Mayor of This Town" or "This Town Mayor". The same rule applies for Treasurer, Town Council, etc. For court seats, put the judge's name in the contest name.
5. **Do not use the description to establish contest uniqueness.** For example if the contest is for a position in Superior Court, use the contest name "**Superior Court - John Doe**" and do not rely on the description ("Should John Doe be retained as a Superior Court Judge").

For long court names, use the description to describe the court. The contest and option name should describe the name of the judge. For example, Instead of the non-unique contest name: "Judge, Court of Special Appeals At Large" which may be automatically truncated to

read "JUDGE, COURT OF SPECIAL APPEALS AT LA", use "**Judge, John Doe**" as the contest name and "**Yes John Doe**" and "**No John Doe**" as the option names. In the description place all the rest, like "**Should John Doe be retained as Judge, Court of Special Appeals At Large?**"

6. **Simple Referendum Contest Names.** Instead of using the entire official title of a referendum (some which have dozens of words), use a short contest name like "**Question 1**" or "**Amendment B**", "**Proposition 12**" etc. followed by the official title and text as needed.
7. **Avoid simple YES/NO options.** Instead, make them unique from contest to contest. If the measure is to approve John Doe, then use "**Yes John Doe**" and "**No John Doe**". If it is for Question 5, then use "**Yes Question 5**". Essentially, it should not be possible to mix up YES and NO between contests *when reading only the option.*

Using these rules of consistency and clarity can improve the ability of voters to verify the ballot, will enable improved ballot image audits with minimal configuration overhead, and will reduce the likelihood of mis-configuration such as that which occurred in Northampton County, PA in the 2023 Election⁵.

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<https://www.lehighvalleynews.com/elections/election-2023-widespread-voting-machine-problems-reported-in-northampton-county>