

**First U.S. Scientific Election Audit Reveals Voting System Flaws  
But Questions Remain Unanswered**  
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**Critique of the "Collaborative Public Audit"  
of Cuyahoga County Ohio's November 2006 Election**

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by Kathy Dopp, [kathy@electionarchive.org](mailto:kathy@electionarchive.org)

Cuyahoga County, Ohio conducted the first U.S. independent sufficient manual audit of election results. The 67 page audit report is a milestone in the effort to reclaim U.S. election integrity.

The auditors used the method developed by National Election Data Archive's Kathy Dopp (myself) and Frank Stenger to calculate the minimum number of precincts that must be manually counted in order to assure with 99% certainty that the election outcomes are accurate. (appendix 2).

The audit was requested by the Cuyahoga County Board of Elections, and conducted by Cleveland State University's "Center for Election Integrity", the League of Women Voters (Cuyahoga County), the Republican and Democratic Parties of Cuyahoga County, Citizen's Alliance for Secure Elections - Ohio, The Greater Cleveland Voter Coalition, and The Northern Ohio Data and Information Service.

The Audit provided ground-breaking, praiseworthy work. However, surprisingly, the audit report did not address the most fundamental question that election audits should answer, "***Were the audited election outcomes correct?***"

*The audit report does not provide the necessary data or analysis to independently verify the accuracy of the election outcomes.* However, let's first discuss some of the praiseworthy work.

The Cuyahoga County Audit reveals, for the first time, some new obstacles to precise and accurate vote counting presented by the design of Diebold's voting system:

1. Diebold's General Election Management System (GEMS) software does not print a report of the vote counts for each digital recording electronic (DRE) voting machine. The auditors had to manually count all the voter verifiable paper ballot thermal paper rolls for entire polling locations. "This means that the accuracy of particular DRE machines cannot be determined via an audit." (p. 35)
2. Diebold GEMS server uses a "JET" database that Microsoft's own documentation states is susceptible to unavoidable corruption when "a lot of concurrent activity is happening with the database". (p. 66)

3. Diebold GEMS server uses two separate database tables to count votes. These tables should contain identical vote counts and yet, in Cuyahoga County, OH the vote counts were off by "over 100 votes for each of the three races checked". The report concludes (p. 34) that, even after working with Diebold, "we have no clarity on which table contains the final accurate results."

In close elections this flaw means that it may *not* be possible to know which candidate won.

4. Some Diebold DRE voting machines have duplicate serial numbers, making it difficult to determine the accuracy of particular DRE machines or to track hardware and software inventory, updates and warranties.

5. Diebold optical scanners "do not count ballots but only ballot pages". Ballots within a county often have varying number of pages this makes it very difficult to determine if all the optical scan ballots are counted once. The Cuyahoga audit found that some batches of absentee ballots were counted twice and some batches of ballots had not been counted once. (In contrast, the former punch-card system was able to determine with complete accuracy whether or not all the ballots had been counted.) p. 35

6. 37 out of 132 precincts (almost one out of every four audited precincts) have discrepancies between GEMS server electronic memory card counts and the paper tape counts that are printed at poll closing.

The Cuyahoga County Collaborative audit is a milestone for American democracy because it shows how effective independent audits are at bringing critical problems and solutions to light to improve elections procedures.

## **WHAT CRUCIAL QUESTIONS REMAIN UNANSWERED BY THE CUYAHOGA COUNTY COLLABORATIVE PUBLIC AUDIT?**

The most crucial question which any election audit must answer is:

**"Were the election outcomes transparently verifiable by the public or are the election outcomes still in question?"**

The Cuyahoga County, OH Collaborative Audit report failed to provide the basic data necessary for the public to independently verify the accuracy of the election outcomes and the sufficiency of the amount of audited precincts. Nor did the audit report provide its own analysis of whether the election outcomes were judged to be accurate.

For the Cuyahoga auditors to meet the public desire for "independent verification that the election results generated by the e-voting technology are accurate", their next audit report could:

- make the program public which they use to calculate audit amounts; and
- provide all the data necessary to judge whether the election outcomes are accurate or not (including the total number of ballots or votes counted in each

audited precinct, the overall margins between the leading candidates which were used to determine audit amounts, the winning candidates, and the maximum amount of discrepancy found in each precinct, including any discrepancies caused by missing voter verifiable paper ballot records and the direction of the discrepancy), and

- make election records and data public that are necessary for the public to verify the audit.

The Cuyahoga Auditors misunderstood how to interpret discrepancy information that their audit results provide. On p. 15, the Cuyahoga Collaborative Public Audit incorrectly states:

"auditing a random selection of precincts can predict what the error rates would be if all the precincts were audited.. and achieve a 99% confidence level in the predictive capacity of the sample..."

This is incorrect. The Cuyahoga County election audit sample size is designed to give 99% probability to detect *at least one* sufficiently corrupt precinct whenever the total number of corrupt precincts is sufficient to alter the election.

***If just one precinct is sufficiently corrupt, then the entire election outcome is in question; and an expanded manual audit or a full hand recount must be triggered.***

Audits in the future must transparently verify whether or not election outcomes are correct.

The full "Collaborative Public Audit" report released April 19, 2007 is available here:

<http://electionarchive.org/ucvAnalysis/OH/CuyahogaElectionAudit.pdf>

Cuyahoga County, Ohio is to be applauded for conducting the first independent scientifically sufficient election audit of electronic vote counts in America.

Election integrity requires more efficient, comprehensive scientific audit procedures which fully answer the question of whether or not election outcomes are accurate **prior to official certification of election results.**

The National Election Data Archive needs your financial or volunteer support now to develop innovative new methods and materials for diagnosing the accuracy of election results in more timely fashion. As you can see, there is much work to be done yet to explain to auditors and election officials how to make election results publicly verifiable; and we very much need your financial support so that this work can be completed. The National Election Data Archive is attempting to raise funds to write a manual for how to conduct completely publicly verifiable audits of election outcomes; and is looking for diligent election officials who would like to be part of a pilot project for conducting sufficient verifiable election audits.

