

Approved:

Policy No.: 15-008(P)

Effective: 4/17/2015

Responsible Divisions: Chief Legal & Equal Opportunity

Supersedes: Policy No. 15-008(P) Dated 3/24/10

\_\_\_\_\_  
Jerry Wray  
Director



**NOTIFICATION OF EMPLOYEE WRONGDOING AND/OR SUSPECTED ILLEGAL  
ACTIVITY AND REPORTING OF HARASSMENT OR DISCRIMINATION**

**POLICY STATEMENT:**

In accordance with Executive Order 2007-O1S, any ODOT employee who becomes aware of suspected illegal activity or wrongdoing by any state employee shall immediately report such activity. The Office of Investigative Services within the Division of Chief Legal is designated to receive all communications with respect to such reports.

As outlined in Policy 32-001(P), the Division of Equal Opportunity is designated to receive all allegations of discrimination and harassment (including sexual harassment) when such action is based on an individual's membership in a protected class. In addition, the Division of Equal Opportunity is designated to investigate allegations of retaliation when such conduct is based on an individual's participation in a protected activity (i.e., filing a charge of discrimination, testifying on behalf of an aggrieved individual, or participating in a discrimination and/or harassment investigation).

**AUTHORITY:**

Executive Order 2007-O1S

**SCOPE:**

This policy applies to all employees of the Ohio Department of Transportation.

**REPORTING ALLEGATIONS OF WRONGDOING OR ILLEGAL ACTIVITY:**

All managers, administrators, labor relations officers, and deputy directors of a District or Central Office division must report any suspected illegal activity or wrongdoing. Managers, administrators, labor relations officers, and deputy directors shall contact the Office of Investigative Services within the Division of Chief Legal prior to initiating any type of inquiry or investigation. It should be assumed the matter is being handled by the Office of Investigative Services unless the reporting party is advised otherwise. In addition to contacting the Office of Investigative Services, the district or division is expected to contact the Ohio State Highway Patrol whenever an emergency response by law enforcement is required.

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The terms “illegal activity” and “wrongdoing” include but are not limited to the following activities:

1. Workplace violence, including verbal or written threats and physical altercations
2. Possession of weapons on ODOT property or in ODOT vehicles
3. Procurement and contracting irregularities
4. Theft or suspected theft, including lost or missing computer hardware or software
5. Fraud
6. Falsification
7. Contact with law enforcement in response to an urgent matter involving ODOT employees
8. Possession of illicit drugs and/or paraphernalia on ODOT property or in ODOT vehicles
9. Misuse of equipment, including but not limited to vehicles, cell phones, pagers and computers
10. Allegations of violations of Executive Order 2007-O1S or state ethics laws.

Employees who are not managers, administrators, labor relations officers, or deputy directors also should report information involving suspected illegal activity or wrongdoing, and may do so by calling either the Office of Investigative Services 1-800-952-5029 or the Inspector General at 1-800-686-1525. Anonymous calls are acceptable.

## **REPORTING ALLEGATIONS OF HARASSMENT, DISCRIMINATION, OR RETALIATION:**

Allegations of harassment, including sexual harassment and allegations of discrimination or retaliation based on race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, military status, or genetic information must be reported to the Division of Equal Opportunity in accordance with Policy No. 32-001(P). When a supervisory or management employee witnesses, is notified of, or otherwise becomes aware of offensive conduct that is based on membership in a protected class, the supervisor or manager must report the conduct to his or her higher level supervisor or to the Division of Equal Opportunity. Ultimately, the Division of Equal Opportunity must be made aware of the conduct. Full disclosure of all information about the incident is required.

Managers, administrators, labor relations officers, and deputy directors shall contact the Division of Equal Opportunity, Internal Civil Rights Manager, prior to initiating any type of inquiry or investigation. It should be assumed the matter is being handled by the Division of Equal Opportunity unless the reporting party is advised otherwise.

## **DEPUTY INSPECTOR GENERAL FOR THE DEPARTMENT OF TRANSPORTATION:**

The deputy inspector general for the Department of Transportation has the authority to investigate wrongful acts or omissions that have been or are being committed by employees of

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the Department. The Office of Investigative Services will coordinate with the Inspector General's office on reports of suspected illegal activity or employee wrongdoing.

**CONTACT INFORMATION:**

The Office of Investigative Services may be contacted at:

800-952-5029 – Toll Free

614-752-5029 - Office

614-395-0004 – Cell phone/Chief Investigator

Deputy Inspector General may be reached at:

800-686-1525 – Toll Free

614-644-9110 – Office

The Division of Equal Opportunity may be reached at:

877-845-5058 – Toll Free

614-728-9245 – Internal Civil Rights Manager

**FISCAL IMPACT:**

The fiscal impact will vary from district to district.



Ohio DOT Office of Materials Management  
**interoffice communication**

Brief on C&MS 448 Sieve Data Manipulation

February 3, 2015

**Background on Item 448**

ODOT pays for Item 448 asphalt concrete based on asphalt binder content and gradation test data. The data is from samples taken from locations randomly selected by ODOT staff and tested at asphalt plant labs by the contractor technician. Quality Assurance (QA) is by ODOT staff on a random and frequent basis by travelling to asphalt plant quality control (QC) labs, witnessing sampling and calculating tests, picking up QC sample splits for further testing in district labs and performing side by side testing for comparison of results.

Item 448 asphalt concrete is primarily used on the secondary roadway system of the state and in small tonnage asphalt projects on the primary roadway system. Sublot asphalt binder content and gradation average results are calculated separately and pay factors adjusting pay determined from tables in the ODOT C&MS book.

**Background of the Problem**

Mick Green, DET of District 6, this past fall developed an approach to determine if 448 sublot data is being manipulated by back calculating. In this approach he could actually calculate the probability of gradation sieve data being manipulated based on sieve weight data submitted by contractors. By this method we then had a way to have a better feel for what was clearly a problem and what MIGHT be a problem.

**The Data Analysis**

Gradations are calculated as percent (%) passing on each sieve size. There is an acceptable range of values for each sieve size and if the % passing test result falls out of the range limits then the requirement is not met and a deduction on pay results.

In manipulating this data one starts with the desired end result and calculates backwards what the sieve weights for each sieve will be based on a selected total weight. When back calculating, randomness in sieve weights is removed due to rounding etc. Thus sometimes back calculating can be pretty obvious. To get around this and make the weights 'appear' random a smarter person can add or subtract small amounts of weight such that data appears more random but in rounding the desired target result is still achieved.

**Results - Data**

Below are four sublot tests (1 lot). All sample data including date, time, contractor and technician are known for each sublot test.

-7 -9 11 12 -11 -7 3 9 -1 11 -5 -9 -10 10 12 -1 6 -10 -9 -7

A bunch of '0's indicates someone who knows how to back calculate but not how to mask it. Other patterns and trends indicate someone who has learned how to mask the data. Here is an easy one to see:

3 -6 0 -5 -8 5 0 0 0 0 0 0 1

# Exhibit 2

Above are two sublots (both part of one lot), one with highly probable actual good data and one with high probability of being back calculated.

Here is one that is harder to tell but it is likely subplot two was manipulated by someone partially masking the effort:



Here is one that is even more difficult to tell if a problem may exist:



## Results – Decision Making

Were ODOT to decide to remove ‘approvals’ of technicians, the obvious problems, which happen to be the newer or less sophisticated technicians, would be easy. However, there are two problems with this. One, where to draw the line without making accusations toward people who actually did not manipulate? Two, do we really want to remove the easy ones and not address the real problem in my mind- those who are more sophisticated at their manipulation, who probably have taught such techniques to newer employees and who will think they have not been caught and are free to continue on with their deceptions?

Realistically, this problem is a manipulation or misrepresentation of gradation data, not the improper changing of material sources actually used or improper reporting of the asphalt binder amount, which are where the real cost is in a ton of asphalt mix. These higher value items are assured by our monitoring program, which includes QA sister tests, and binder data which is very difficult to manipulate since the testing is done differently. Aggregates and their gradation is a low cost item so there is nothing gained by the bad data except assuring that 100% pay is achieved if there is nervousness about a result being out or the technician simply does not have to do 1.5 hours of work to get a result (ie laziness or in a hurry).

There are several reasons why it is believed in most cases of this manipulation that actual mix gradations are not way out of specification. One, as stated earlier there is no indication of any performance issues in our 448 asphalts due to poor gradations. Two, most of the 448 mixes are Type 1 mixes which are the easiest and most consistent to produce at plants. Three, when gradations are way off volumetrics (ie air voids) will suffer. Out of specification or excessive variability in air voids is not usually seen in ODOT QA testing of this mix type. Finally, valid subplot tests adjacent to manipulated sublots usually have results that are acceptable as well as ODOT QA gradation tests have not indicated repeated gradation comparison issues.

## What to do?

- 1) ODOT to meet with Flexible Pavements of Ohio to bring them up to speed on the issue and show the data since they have an interest in the integrity of what needs to happen.
  - 2) ODOT to meet with all contractor QC managers to explain the analysis and then individually present them the names of those we suspect. Obtain a written response from them of their follow-up actions (list of actions in long report) as discussed with management and FHWA.
- c. Brad Jones- DDCM, Lisa Zigmund-OMM

Lisa- Below is a summary of districts responses or planned responses to ODOT 448 test data provided by Mick as of 3/13/15. I have asked for an email reply after they hold their meeting. At the bottom are replies to date.

**District 1- Kris Gaertner 999 6907:** D1 did not have data entered. Kris has proactively taken steps to not only rectify that but also look at the district monitoring, testing and reporting processes in place with her staff. Some changes are already being made. One of her staff is off but she intends to meet with all staff by end of March to cover: Explanation of problem, examples of contractor and ODOT bad data, FHWA involvement, importance of all data reported, why falsification is serious, and appropriate responses to dealing with contractor QC techs (as provided in my 3/9 email to DETs).

**District 2- Eric Heckert 373 4464:** Eric was of the mindset which was common that their data was not too bad and thus only wanted a group meeting. I took the time to show where there were trends of bad data and who his techs were that were possibly involved. By conversation end he agreed there could be a problem. As occurred in many of my conversations with districts I suggested that in addition to a general group meeting (content same as District 1 meeting above) he needs to at a minimum have one on one with specific people. I also brought to Eric's attention the problem of problem Shelly techs- most of them were in Districts 1 and 2 (Shelly Findlay division) and that may have been an influence. Follow up: His group meeting was on 3/11. He also met with his questionable people one on one and feels very confident there was actually no issue.

**District 3- Brian Hickey, Perry Ricciardi- 207 7037:** Brian's thinking was similar to Eric's above. His data was not as bad but I showed him where there were patterns. There was one person mainly involved, an HT from maintenance. Brian thought this was a good person but in discussion I found out he had worked for a now defunct contractor whose QC manager had a history of issues. Brian says the HT may not be back due to changes where this person works. Brian was not clear they would get a replacement or go consultant. Brian says he already held a group meeting with contents similar to in D1 above. Brian agreed to have a one on one if the old HT comes back and for any replacement

**District 4- Marla Penza 786 3190:** Marla had some pretty extensive issues that she partly agreed with after our discussion. These were involving more than one person. At least one of those will not be back due to injury, this person was a consultant. A general meeting will be held soon, one on ones will be in late April due to HTs out of maintenance. No further plans were being thought about.

**District 5- Ed Gephart, Sam Oiler 323 5290:** Their data showed isolated possible but not devastating issues and overall it was pretty good. He held a group meeting with content as D1 above on 3/11.

**District 6- Mick Green 833 8330:** Mick had some moderate issues but nothing real obvious. Also like D5 instances were pretty isolated. He already had a one on one with one tech. He plans a group meeting in 1-2 weeks and at least one more one on one.

**District 7 Carrie Koesters 497 6776:** Carrie like others did not think their data was too bad. After discussion I think she was in more agreement that their one tech could have had some issues. I advised a one on one with that tech. Since this tech started in 2014 it was reasonable to think they would not be an issue. However in discussion it became clear the new tech was trained by a tech who left ODOT after 2013. That tech also had some problematic data. There will be a group meeting soon.

## Exhibit 2

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**District 8 Jon Milesky 933 6616:** Jon has already sent an email about his group meeting. He had one very obvious tech who has been in testing a very long time and is a good employee. He plans to have a one on one with this tech when back from being off.

**District 9 Paul Maravy 774 8931:** Paul did not have an obvious big problem. There were a couple tests that were highly suspect and some possibles. I advised him as to what to say in a group meeting and to have a one on one with one tech. I also advised him to fill in his new boss.

**District 10 Greg Huffman 568 3935:** Greg's guys were not putting their data in SM. He has 2 main monitors and they usually do their testing at plants, not at the district. We discussed his problem contractors. He agreed they need to put data in SM.

**District 11 Bryan Lehigh 308 3913:** Bryan was alarmed by his data and did not attempt to minimize any of it. He had some pretty moderate issues, fairly extensive with one lab person. He and Nick agreed to not bring this HT back even though he had been there for some time. He had one position posted already and received permission to post another. Bryan extensively researched the bad tests and discovered something interesting. In D11 they do a lot of 446. That means there is a daily road sample which does come from the road and not the plant. That sample is an AC check but once per week it is to be graded. Many of the bad tests were this weekly test- it was not being done- just penciled. Bryan will train any new people brought in on testing and ethics.

4-13-15  
Nick call  
- is taking it  
to LRO.

**District 12 Nader Armand 584 2170:** Nader and his boss, Greg, have discussed and agree on the following approach with their own people. In mid April, when Hts are back from maintenance, a group meeting will be held, like discussed above. Also, one person probably had issues and will have a 1 on 1. Nader was also anxious to get the analysis program so he can check his own and QC technicians.

### District Responses:

#### D2 response:

Dave --

Last week (3/11/15) I met with all but two of our Level III certified asphalt technicians as well as our DCA and test lab TM. I plan on reviewing with the other two people later this spring. During this meeting we went through the ethics presentation you provided to the industry, as well as discussing that asphalt trucks would be required to have complete tarp coverage and decided by the DCAs at their last meeting.

We also review the 448 data. Our technicians did not see the names of contractor technicians. I did show the names for the data from our lab. Obviously there was some shock and concern with contractor data. I do not believe we have a 'problem' with our data, as I spent approximately an hour each with 3 individual after our meeting trying to explain and clarify what the data was showing (meaning there was some confusion with comparing splits, comparing to JMF, and conveying the actual problem was them hitting a 'target' number with abnormally high frequency). Pretty much all of our staff felt it would be harder to cheat than to simply do things proper.

While I do not feel we have an internal issue, it was made clear that IF this happened in our lab in the past it will stop immediately. If make a mistake and the sample cannot be salvaged or if we cannot

justify remaining results (such as we simply forgot to write down a sieve weight for one sieve) the sample should be a Lab Error.

I also tried to make it clear that we will continue to do what we normally do. Most likely the contractor issue most typically occurs when our monitors are not present. Consequently, our monitoring process is not the cause for the issue at hand. Without additional monitors, those opportunities will still exist for contractors. I believe our monitors randomly pay attention to scale weight, but the one thing that I did suggest was to pay slightly closer attention to making sure the scale numbers what were what was written on the worksheet. However, I did make clear that I did not want them 'harping or hovering' on all data since there are still other items that require our attention and we do not want contractor technicians to feel isolated. It is my intention that we will function with the business as usual approach this season

It was also shared that OMM will continue to monitor this situation more frequently this season for both ODOT and contractor test data.

Let me know if you have any questions or need any additional information.

Thanks  
Eric

**D5 response:**

Good morning Dave,

Sam and I met with Tom Bobbitt, Chris Henwood, Jerry McQuain, Donna Hunter, and Marianne Konkler yesterday (3/11) to discuss the testing issues with the 448 asphalt.

We went through the ethics power point and discussed it with them.

We then tried to explain the "working backward" method and what the data in the spread sheets means.

Then we showed them the contractor data and the district data, with no names, and discussed the results.

They asked who the suspected technicians were, and we told them we could not release their names.

We restated the points you gave in your email;

1. By not knowing names, they would not treat technicians differently.
2. Each company has been provided a list of suspected techs, and each company was going to deal with it internally. ( like adding a section in their QCP about ethics in testing asphalt).
3. Central office will continue to run the query looking for problem test results, and address them if they occur.
4. When you are at a plant, make sure you check scale weights, calculations, and just follow what the specifications call for.

We also advised them, if they were asked questions by the contractor's tech. about what is going on, not to answer them and recommend to the tech. they ask the company quality control person.

Thanks for your help and let us know if we should do anything else.

**D8 response:**

A meeting was held in the District 8 Test Lab today (3/9).

Dennis Stemler, District 8 DEC, Tommy Wallace and myself talked to the employee about the situation with the Lab Tech's (contractors) and also about issues with ODOT employees. Tommy presented a spread sheet showing that most of the issues in District 8 happened when there were not monitors in the plants.

We talked about Ethics, and if there was any tools that ODOT could provide to make their jobs easier. They all said that the issue is not the tools but the manpower. We are two plant inspectors short of the recommended number that was set by CO.

New steps that will be done to try to insure that there are no issues while we are on sight.

- 1) Stand side by side while tests are being performed and write down the numbers that the tech gets to double check.
- 2) If a test was performed when an ODOT Inspector is not present look over their numbers and see if a pattern is obvious.
- 3) More face time in the field at the job site to stop violation like flipping the wings of the paver and cleaning trucks out on the mat.
- 4) An email will be sent out to the field engineers to get their core in, in a more timely manner.
- 5) Internally, if there is not enough time to perform all the test, ask for help. Never just pencil whip a sample.

I feel that there will always be external short cuts when we are not present, but we will try to be more pro-active in heading them off when we are in the plants.

As far as internal, we have told everyone that they are being watched and that falsifying records is a fire able offence. As stated above, we told them to ask for help.

Jon

**Shore, John**

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**From:** Zigmund, Lisa  
**Sent:** Tuesday, April 14, 2015 12:30 PM  
**To:** Shore, John  
**Subject:** RE: Information needed  
**Attachments:** Statewide 448 Lots 2014.xlsx

Over the winter, one of our district Test Engineers compiled a spreadsheet of test results for one of our tests on one of our types of asphalt. Simplistically, he color coded data and was able to show patterns in the resultant numbers. He then theorized, using basic probability and statistics, that test results should be random, and if there were patterns in the colorcoding, it indicated un natural results. (i.e. possible back calculating in or fudging numbers). The testing the districts do are quality checks(QA), and do not directly result in pay incentives or disincentives to a contractor.

The data came from both contractors(Quality Control testing) and ODOT (Quality Assurance testing). This methodology was shared with management in Construction, the industry, (Flexible Pavements Assoc and all QC Managers in asphalt), FHWA, the statewide groups of DETs and DCAs. The DET's were advised to review their district individually and manage as appropriate.

While this analysis indicates the possibility of a problem in our Quality Program, it isn't foolproof. Other indications from the analysis, Contractors data had more pattern than ODOTers. Some Contractor data had a pattern, until the ODOTer was onsite doing a split test. We will be monitoring data through the next season and reporting in with FHWA.

I am glad to walk you through the attached spreadsheet, and go over in more detail. Please let me know what you need from me.

Respectfully,

**Lisa Zigmund, P.E.**

Administrator, Office of Materials Management  
Ohio Department of Transportation  
1600 West Broad Street  
Columbus, Ohio 43223  
Email: [lzigmund@dot.state.oh.us](mailto:lzigmund@dot.state.oh.us)  
Phone: (614) 275-1351

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**From:** Shore, John  
**Sent:** Tuesday, April 14, 2015 10:26 AM  
**To:** Zigmund, Lisa  
**Subject:** Information needed

Lisa,

I had a recent inquiry regarding our test labs in the districts regarding the falsification of official documents. To your knowledge, is there any ongoing issues with any of our test lab employees falsifying any documents related to asphalt or any other type of testing?

## Exhibit 2

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According to my source this info/news has been shared at recent DD and other upper level meetings. I am aware of issues that have been referred to other agencies but I need to ensure that all that is happening has made it at least to my office.

Thank you,

*John Share*

Chief Investigator  
Ohio Department of Transportation  
Office of Investigative Services  
1980 West Broad Street  
Columbus, OH 43223  
614-752-5029

**Shore, John**

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**From:** Zigmund, Lisa  
**Sent:** Monday, April 20, 2015 11:33 AM  
**To:** Shore, John  
**Subject:** RE: Updated 448 Approximate Odds

Yes, the chances of all the sieves being the \* star value is highly unlikely. Each sieve had the possibility of weighing one of 20 possibilities that would round to the rounded number. Being a 0 (the star value) should happen one in 20 times. Being the star value on every sieve multiplies the unlikelihood.

**From:** Shore, John  
**Sent:** Monday, April 20, 2015 10:44 AM  
**To:** Zigmund, Lisa  
**Subject:** RE: Updated 448 Approximate Odds

Well...  
 Looking at the first line,

8	SUPERPAVE 19MM	kmiller314AV142910	JCTL	Lot 4	GSTANFIELD	2077	0	0	0	0	0	0	0	1,801,088,541
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Is he saying the chances of all of these tests being Zero are one in 1.8 billion?

*John Shore*

Chief Investigator  
 Ohio Department of Transportation  
 Office of Investigative Services  
 1980 West Broad Street  
 Columbus, OH 43223  
 614-752-5029

*EXPLANATION FROM  
 ZIGMUND*

**From:** Zigmund, Lisa  
**Sent:** Monday, April 20, 2015 10:30 AM  
**To:** Shore, John  
**Subject:** FW: Updated 448 Approximate Odds

Below is the explanation from Mick, does that help?  
 Lisa

**From:** Green, Mick  
**Sent:** Wednesday, March 11, 2015 2:42 PM  
**To:** DOT CEN MaterialsDET  
**Cc:** Powers, David; Biehl, Eric  
**Subject:** Updated 448 Approximate Odds

## Exhibit 2

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Attached is the updated 448 approximate odds which have been tweaked but are still a work in progress. You may notice that some tests with more obvious patterns are lower on the list than less obvious patterns. This is most likely because of the sample size. Some very small sample sizes only have a small range of possible outcomes.

The approx odds are based on pattern of results, sample size, being in vicinity of red zone, all positive or all negative results, and positive and negative of the same number.

Suggestions to make it more accurate are welcome.

Thanks,  
Mick

“With God All Things are Possible” - State Motto



**Mick Green's explanation of the problem.**

The proper way of running a gradation basically involves weighing the amount on each sieve in grams and dividing by the starting weight in order to calculate the percent retained on each sieve and then doing a few additional calculations to get % passing

working backwards (or cheating) could entail not running the sample but choosing a reasonable starting weight, reasonable percents passing each sieve, and then calculating the number of grams required to make those numbers work

with approx 2000 gram samples, getting percent passing to the nearest whole number (as required by spec) means that there is a range of about 20 grams that will equate to each whole percent

the technician working backwards will calculate the exact number of grams that corresponds to the percent passing he chose. He then has the option to use that number of grams (we will call this "\*" ) or he may choose anywhere from about 10 grams greater than \* to about 10 grams less than \*

we would expect a random distribution of \*-10g thru \*+10g for the number of grams for each sieve but a pattern of only certain results may indicate working backwards. For example a lazy cheating technician may figure the \* value and then always add 2 grams hoping that his pattern will never be detected. A non-lazy cheating tech may figure the \* value and then randomly add or subtract between 1 and 10 grams, therefore not being detectable

so if someone wanted to cheat they could, for example, choose to get a 42% passing the #8 sieve because it is very close to the JMF value of 40%. Choosing a reasonable starting weight close to 2000g, 2048g let's say, they can back calculate to know that 1188 +/- 10g is the value they can use to get the desired outcome.

# Exhibit 3

example for #8 sieve

	2048g starting weight		
	grams	% passing	rounded
*-10g	1178	42.48047	42%
*-9g	1179	42.43164	42%
*-8g	1180	42.38281	42%
*-7g	1181	42.33398	42%
*-6g	1182	42.28516	42%
*-5g	1183	42.23633	42%
*-4g	1184	42.1875	42%
*-3g	1185	42.13867	42%
*-2g	1186	42.08984	42%
*-1g	1187	42.04102	42%
<b>*</b>	<b>1188</b>	<b>41.99219</b>	<b>42%</b>
*+1g	1189	41.94336	42%
*+2g	1190	41.89453	42%
*+3g	1191	41.8457	42%
*+4g	1192	41.79688	42%
*+5g	1193	41.74805	42%
*+6g	1194	41.69922	42%
*+7g	1195	41.65039	42%
*+8g	1196	41.60156	42%
*+9g	1197	41.55273	42%
*+10g	1198	41.50391	42%

example of working forward (not cheating)

start wt

	2048			*	* -	
	grams	% passing	rounded	grams	actual	result
	step 1	step 2				
3/8	178	91.30859	91	184	184-178	*-6g
#4	927	54.73633	55	922	922-927	*+5g
#8	1186	42.08984	42	1188	1186	*-2g
#16	1364	33.39844	33	1372	1372-1364	*-8g
#30	1638	20.01953	20	1638	1638	*
#50	1851	9.619141	10	1843	1851	*+8g
#100	1968	3.90625	4	1966	1966-1968	*+2g

real example working backwards (cheating)

start wt

	2048				
	%	passing	grams	rounded	result
		step 1	step 2		odds of getting * number of grams
3/8	91.0		184.32	184	*
#4	55.0		921.6	922	*
#8	42.0		1187.84	1188	*
#16	33.0		1372.16	1372	*
#30	20.0		1638.4	1638	*
#50	10.0		1843.2	1843	*
#100	4.0		1966.08	1966	*

pattern is detected due to result always being \* value

the odds of getting grams to equal 184 (\*), 922 (\*), 1188 (\*), 1372 (\*), 1638 (\*), 1843 (\*), 1966 (\*) instead of 178 (\*-6), 927 (\*+5), 1186 (\*-2), 1364 (\*-8), 1638 (\*), 1851 (\*+8), 1968 (\*+2)

odds of all 7 sieves getting \* number of grams = (1/21)^7 or 1 in 1,800,000,000 (almost 1 in 2 billion chance)

another way of looking at it:

odds of getting number of grams to equal percent passing as a whole number.

in essence, getting 91.0, 55.0, 42.0, 33.0, 20.0, 10.0, 4.0 instead of something like 91.3, 54.7, 42.1, 33.4, 20.0, 9.6, 3.9.

this example was detected from the second tab due to the percents passing all being very close to a whole number 91.01, 54.98, 41.99, 33.00, 20.01, 10.00, and 4.00

another real example

	1A			1B			1C			1D	
	2050	start wt		2015	start wt		2016	start wt		2020	start wt
	grams	% passing	result	grams	% passing	result	grams	% passing	result	grams	% passing
3/4	63	97	*+1	43	98	*+3	31	98	*-9	42	
1/2	412	80	*+2	344	83	*+1	405	80	*+2	426	
3/8	575	72	*+1	546	73	*+2	672	67	*+7	668	
#4	983	52	*-1	989	51	*+2	1170	42	*+1	1153	
#8	1252	39	*+1	1290	36	*	1344	33	*-7	1354	
#16	1457	29	*+1	1452	28	*+1	1539	24	*+7	1536	
#30	1642	20	*+2	1614	20	*+2	1677	17	*+4	1678	
#50	1785	13	*+1	1775	12	*+2	1798	11	*+4	1799	

# Exhibit 3

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#100 1887 8 \*+1 1834 9 \* 1879 7 \*+4 1879

odds of results only being \*-1, \*+1, or \*+2

is  $(3/20)^9$  or 1 in 26 million chance

odds of results only being \*, \*+1, or \*+2

is  $(3/20)^8$  or 1 in 4 million chance

odds of resul

is  $(3/20)^9$  or

odds for 3 sublots only having results of \*-1, \*, \*+1, or \*+2 is  $(4/20)^{26}$  or 1 in  $1.5 \times 10^{18}$  chance

this example was detected from the second tab due to the percents passing mostly ending in .9

for subplot 1D the percents passing were 66.93, 42.92, 32.97, 23.96, 16.93, 10.94, and 6.98 for sieves 3/8 thru #100