TO: Cannabis Compliance Board

FROM: John Ackell, General Manager, Zenway Corp

DATE: November 17, 2025

RE: Hearing on Notice to Adopt Changes to NCCR 1, 10 and 11

SENT: Via email to Regulations@ccb.nv.gov

I am the General Manager of Zenway Corp. We are an independent cultivation facility located in North Las Vegas. We employ 15 Nevada residents and have been operating since 2018.

In Nevada, the cultivation facilities pay for lab testing. We cannot sell anything prior to testing and need to obtain a Certificate of Analysis (COA) from a state licensed lab to do so. Therefore, we are the party most financially affected by these proposed regulations. And, as proposed, these regulations are prohibitively expensive.

As you may know, the number of cultivations in Nevada has dropped 34 in a little more than two years. This is in excess of 23%. The reasons are varied but, certainly, one of the most significant reasons has been rising costs.

Lab testing is already one of our major costs. The proposed regulations raise costs in at least three ways. One, uncertain document costs. Two, by raising the sample amount from 10g to 60g and using current Nevada Department of Taxation pricing, the cost increases over $140 per test. This alone is almost a 50% increase in lab costs. Three, there will be additional costs to the labs for taking more samples, managing these samples, and logging these samples. I assume they will need to raise their price as well.

We support any measure to reduce lab costs. These proposed regulations do just the opposite and conflict directly with the language and intent of Senate Bill 157. My understanding of the bill is simple. As lot sizes increase so do the sample sizes (sliding from 10g to 20g). This makes logical sense. 60g does not.

Zenway Corp already faces rising costs from every direction. So many cultivations have already closed their doors, and the Cannabis Compliance Board should not be enacting more regulations that raise our operating costs even further.

Thank you for your consideration of our concerns. I am happy to answer any addition questions you may have.

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November 19, 2025

Cannabis Compliance Board
State of Nevada
700 East Warm Springs Drive, Suite 100
Las Vegas, NV 89119
regulations@ccb.nv.gov

Re: **Notice of Intent to Act Upon Regulations**
Amendments to NCCRs 1, 4, 5, 6, 7, 11, 12, 13, and 15

Dear Cannabis Compliance Board Chair Guzman Fralick, Board Members, Executive Director Humm, and Deputy Director Miles:

By this letter, this law firm hereby submits its comments in response to the Cannabis Compliance Board's ("CCB") original and amended NOTICE OF INTENT TO ACT UPON REGULATIONS ("Notice of Intent") scheduled for hearings to begin on November 20, 2025. This office has participated and practiced in the area of Cannabis Law since the ratification of the sale of Medical Marijuana in Nevada before the State and District Courts.

These comments are not intended to address any specific proposed regulatory amendment, but rather serve as a general comment or inquiry upon the CCB's entire effort to amend its Nevada Cabanis Compliance Regulations ("NCCRs") 1, 4, 5, 6, 7, 11, 12 ,13 and 15. We start this discussion with the understanding that in 2023 the Nevada Legislature (the 82nd Session) specifically repealed the CCB's exemption from the Nevada Administrative Procedure Act ("APA", NRS Chapter 233B) and placed the CCB under the list of state agencies which must comply with the APA, including its provisions regarding adoption and amendment of regulations.

Key among the relevant procedural requirements of the APA is NRS 233B.062's requirement that the Legislative Counsel Bureau ("LCB") must place all permanent regulations in the Nevada Administrative Code ("NAC"). We,—as members of the relevant Cannabis Bar within the State Bar of Nevada, who are often in the position to apply and interpret regulations,- have been advised that the LCB has begun the process of reviewing the NCCRs as required by NRS 233B.063. The statute requires the LCB to review and "if appropriate" revise the language of proposed agency regulations so that the regulations are "clear, concise, and suitable for incorporation in the Nevada Administrative Code." Obviously, this issue needs to be addressed and the process revised, if necessary.

It is generally understood that this process has not been completed, and in the case of some of the instances of the various Chapters even initiated, and that for some reason the process of LCB review and revision of the existing NCCRs has stalled. As a result, the NCCRs have not been "reviewed" as required by NRS 233B.063 and certainly have not been codified as part of the NAC as required by NRS 233B.062.

Nevertheless, the CCB has noticed the current regulatory amendments as revisions of the NCCRs, rather than as proposed regulations to be codified as part of the NAC as required by the APA. As such, this Notice of Intent actually ignores the NRS 233B.062 and NRS 233B.063 requirements that agencies adopting regulations under the APA must do so as ***additions to the NAC***. The Notice of Intent and the proposed regulations therefore clearly do not comply with the substantive and procedural requirements of the APA.

Indeed, under NRS 233B.064, the ***current*** NCCRs are also arguably improper and/or unenforceable, as the APA prohibits the adoption of permanent regulations until the CCB has received LCB review and approval and/or revisions of the regulations. As stated above, this process has not been completed, and at this time the NCCRs exist outside of the formal NAC. Accordingly, it appears that the proposed amendments to the NCCRs are improper and untimely until the existing NCCRs are reviewed by the LCB and codified as part of the NAC.

Therefore, in accordance with NRS 233B.110(1), the undersigned respectfully requests that as part of the CCB's "acting" upon the proposed regulations under the original and amended Notice of Intent, that the CCB "pass upon the validity of the" ***existing and proposed NCCR regulations***. To be absolutely clear, this request to "pass upon the validity" of the regulations is made as required by NRS 233B.110(1) as expeditiously as possible.

Thank you for your consideration of these legal points and thank you in advance for your determination(s) to be made under NRS 233B.110(1).

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November 19, 2025

Chair Adriana Guzmán Fralick
Nevada Cannabis Compliance Board

As industry leaders in cannabis and pathogen genomics, we have spent decades working with quantitative polymerase chain reaction (qPCR) and culture-based methods for the detection of microorganisms. We are experts in the field with over 40 patents related to PCR and DNA sequencing based methods for detecting microorganisms. Kevin McKernan, Chief Scientific Officer at Medicinal Genomics Corporation (MGC) managed the Research and Development team for the Human Genome Project at the Whitehead Institute of MIT. He has over 64,650 citations related to his work in this field. Our scientists recommend microbial testing specifications that will ensure that medical cannabis plant material and manufactured products are safe for patients. Due to concerns for public health, the Nevada Cannabis Compliance Board (CCB) should modify the proposed cannabis testing regulations, which include those to detect microbial contaminants that reflect ongoing efforts at AOAC International, ASTM International, the United States Pharmacopeia (USP), the Centers of Disease Control and Prevention (CDC), and the United States Food and Drug Administration (FDA) that are consistent with our findings at MGC.

The presence of microorganisms is common on plants, such as cannabis. One must be able to differentiate between harmless and/or beneficial microbes (bacteria, yeasts, and fungi) ubiquitous in nature and those that are human pathogens that have contaminated the cannabis plant material and/or manufactured products. Examples of pathogens that have caused human illness and even death affiliated with cannabis use are *Salmonella* species, Shiga toxin producing *E. coli* (STEC), *Aspergillus flavus, A. fumigatus*, *A. niger*, and *A. terreus* [1-29].

Current required tests for microbial contamination in states that have a medical and an adult-use cannabis program vary among the states. For the different sample types, some states require different combinations of total count tests, such as Total Aerobic Count (TAC), Total Yeast & Mold (TYM), and Total Enterobacteriaceae; as well as the six human pathogens listed above with various action levels for each test and each cannabis product type. On the other hand, other states, such as California, Montana, and Vermont only require tests for detecting the human pathogens *Salmonella* spp., STEC, *A. flavus*, *A. fumigatus*, *A. niger*, and *A. terreus* for inhalable products.
NOTE: Total count tests have action levels as colony forming units (cfu/g), which is the number of colonies that grow on the surface of an agar medium plate. Specific pathogen tests have an action level of "<1 cfu per 10 grams".

The PROPOSED REGULATION OF THE CANNABIS COMPLIANCE BOARD OF NEVADA LCB File No. R152-24 August 19, 2025 [30] states in Sec. 68. NCCR 11.050 is hereby amended to read as follows:

2. The tests required pursuant to subsection 1 by a cannabis independent testing laboratory are as follows:

Sample type: Usable cannabis, infused prerolls and crude collected resins, as received, excluding wet cannabis

Tests Required	Action Levels
Total yeast and mold	< 10,000 colony forming units per gram
Total Enterobacteriaceae	< 1,000 colony forming units per gram
Salmonella	None detected per gram
Pathogenic E. coli	None detected per gram
Aspergillus fumigatus	None detected per gram
Aspergillus flavus	None detected per gram
Aspergillus terreus	None detected per gram
Aspergillus niger	None detected per gram

Sample type: Usable and wet cannabis, as received, which is destined for extraction

Tests Required	Action Levels
Total Enterobacteriaceae	< 1,000 colony forming units per gram
Salmonella	None detected per gram
Pathogenic E. coli	None detected per gram

Sample type: Extract of cannabis (nonsolvent) like hashish, bubble hash, infused dairy butter, mixtures of extracted products or oils or fats derived from natural sources, including concentrated cannabis extracted with ethanol or CO2; Extract of cannabis (solvent-based) made with any approved solvent, including concentrated cannabis extracted by means other than with ethanol or CO2

Tests Required	Action Levels
Total yeast and mold	< 1,000 colony forming units per gram
Total Enterobacteriaceae	<100 colony forming units per gram
Salmonella	None detected per gram
Pathogenic E. coli	None detected per gram
Aspergillus fumigatus	None detected per gram
Aspergillus flavus	None detected per gram
Aspergillus terreus	None detected per gram
Aspergillus niger	None detected per gram

Sample type: Edible cannabis product, including a product which contains concentrated cannabis/Liquid cannabis product, including, without limitation, soda or tonic, including a product which contains concentrated cannabis

Tests Required	Action Levels
Total Enterobacteriaceae	< 1,000 colony forming units per gram
Salmonella	None detected per gram
Pathogenic E. coli	None detected per gram
Total aerobic count	< 100,000 colony forming units per gram

MGC agrees that testing to detect the human pathogens that have been associated with cannabis use for the products and extracts listed in the above tables. The United States Pharmacopeia (USP) stated that "Many states with legalized cannabis markets now require that all cannabis goods intended for consumption by inhalation be tested for the four pathogenic *Aspergillus* species (*A. flavus, A. fumigatus, A. niger,* and *A. terreus*). When inhaled, all four of these species are known to cause a variety of immune lung disorders, ranging from asthma, allergic bronchopulmonary aspergillosis, and hypersensitivity pneumonitis to invasive and life-threatening systemic fungal infections in immunocompromised hosts." [31]

Our first recommendation is replacing pathogenic strains of *E. coli* with Shiga Toxin-producing Strains of *E. coli* (STEC). There is no single test using any technology that can detect all six pathogenic strains of *E. coli.* STEC is the most pathogenic strain of the six pathotypes with a minimum infection rate of <10 cells, which is 100,000 to 10,000,000 times lower than the other pathotypes.

The number of states and territories that require microbial testing rules for inhaled cannabis products (flower, pre-rolls, vape pens, *etc*) was 25 in 2019 [32] and 43 in 2025 [33]. A comparative analysis of the required microbial testing rules for all jurisdictions with legal cannabis programs in 2019 and in 2025 showed that the percentage of states and territory that require the detection of the pathogens listed above has increased during this 6 year period (see the following table).

Microorganism (2019)	# (%)	Microorganism (2025)	# (%)	% Increase over 5 years
Salmonella species	22 (85%)	*Salmonella* species	41 (95%)	**10%**
STEC	4 (15%)	STEC	21 (49%)	**34%**
4 *Aspergillus* species	8 (30%)	4 *Aspergillus* species	24 (56%)	**26%**

Since other states and territories are in the process of either modifying or adopting their initial microbial testing rules and new states & territories will legalize cannabis in the future, we predict that the percentage of jurisdictions requiring the detection of microbial pathogens for inhaled products will continue to increase.

Our second recommendation is that total microbial count tests ("indicator tests"), such as TAC, TYM, and TE must not be required, because indicator tests do not directly test for pathogens. Total count tests do not provide pathogen-specific data relevant to cannabis safety. Relying on broad microbial counts provides no clear indication of human health risk.

Rationale for Second Recommendation

1. **Lack of Pathogen-Specific Data**

According to the American Herbal Pharmacopoeia's 2014 Monograph on Cannabis Inflorescence [34], total microbial count tests **should not** be used as a basis to fail cannabis samples simply for exceeding action levels. These tests, which include TAC, TYM, and TE do not differentiate between harmful and benign microorganisms. Therefore, a total count test result **provides no** information about the presence of human pathogens. Moreover, there are 35 microbiological pesticides that have been approved for cannabis cultivation by one or more states (MGC dataset). The primary ingredient in these microbiological pesticides is either a beneficial bacterial or fungal strain. These beneficial microorganisms prevent pest infection (bacterial, fungal, insect, and/or nematode cannabis pathogens) that could lead to reduction of cannabinoid yield or total crop loss. Required total count tests cause cultivators to use toxic chemical pesticides instead of harmless microbiological agents.

2. **No Link Between Total Count and Disease**

There are no peer-reviewed studies demonstrating that specific thresholds of total microbial counts (TAC, TYM, or TE) are correlated with human disease. Without such research, it is scientifically unjustified to rely on these counts as criteria for failing cannabis samples.

3. **No Clinical Evidence from Cannabis Use**

To date, no clinical case studies have shown that total microbial counts (TAC, TYM, and TE) on cannabis lead to human illness. The lack of such evidence further questions the relevance of these tests for ensuring public health safety.

4. **Failure to Satisfy Koch's Postulates**

Koch's Postulates, the gold standard for establishing a microorganism's role in causing disease, cannot be fulfilled by total count tests. These tests do not isolate or identify specific pathogens, but instead measure a broad and often harmless community of microorganisms. Without isolating disease-causing species, total counts cannot accurately assess the risk of human illness.

Therefore, the following modifications should be made to the above table:

Sample types:
Usable cannabis, infused prerolls and crude collected resins, as received, excluding wet cannabis;
Extract of cannabis (nonsolvent) like hashish, bubble hash, infused dairy butter, mixtures of extracted products or oils or fats derived from natural sources, including concentrated cannabis extracted with ethanol or CO2;
Extract of cannabis (solvent-based) made with any approved solvent, including concentrated cannabis extracted by means other than with ethanol or CO2;

	Standard
Shiga toxin producing strains of *Escherichia coli* and *Salmonella* species	< 1 CFU/10 grams
Aspergillus flavus	< 1 CFU/10 grams
Aspergillus fumigatus	< 1 CFU/10 grams
Aspergillus niger	< 1 CFU/10 grams
Aspergillus terreus	< 1 CFU/10 grams

NOTE: The action levels for all tests listed in the table above should be "< 1 CFU/10 grams" to allow for a sample size recommendation that follows.

Sample type: Edible cannabis product, including a product which contains concentrated cannabis/Liquid cannabis product, including, without limitation, soda or tonic, including a product which contains concentrated cannabis

	Standard
Shiga toxin producing strains of *Escherichia coli*	< 1 CFU/10 grams
Salmonella species	< 1 CFU/10 grams
Listeria monocytogenes	< 1 CFU/10 grams

Sample type: For MICROBIOLOGICAL TESTING OF INFUSED NON-EDIBLES

	Standard
Candida albicans	< 1 CFU/10 grams
Pseudomonas aeruginosa	< 1 CFU/10 grams
Streptococcus aureus	< 1 CFU/10 grams

Our third recommendation concerns the allowable methods to detect these recommended 10 human pathogens for the different sample types, which should be molecular detection. In light of advancements in laboratory technology and the critical need for accurate and timely pathogen detection, MGC recommends that the CCB allow molecular testing methods, such as qPCR and other DNA-based assays, as validated technologies for specific cannabis pathogen testing.

Molecular methods offer significant advantages over traditional agar plating, which includes greater specificity & sensitivity for detecting the human pathogenic species of *Aspergillus, Salmonella*, and Shiga-toxin producing *E. coli* (STEC), *Candida, Pseudomonas, and Streptococcus*. These methods can provide results in hours rather than days, enhancing safety by enabling faster decision-making in product release, and reducing the risk of contaminated products reaching consumers. The adoption of molecular methods will align Nevada's cannabis testing regulations with those in other highly regulated industries, such as food and pharmaceuticals, which already leverage these tools to ensure product safety. By allowing for molecular testing, Nevada can strengthen its public health protections, support innovation in its testing labs, and streamline the regulatory compliance process for cannabis producers and testing facilities.

Most importantly, there are multiple AOAC certified Performance Tested Methods (PTMs) using cannabis as a sample type that are being used by licensed cannabis labs throughout the world. These PTMs were developed by the AOAC Cannabis Analytical Science Program (CASP), which is a forum where the science of cannabis analysis can be discussed and cannabis standards and methods developed. To date, AOAC has released three (3) Standard Method Performance Requirements (SMPRs) for the six human pathogens that we have recommended for testing (see #1-3 below).

1. Detection of *Aspergillus* in Cannabis and Cannabis Products https://www.aoac.org/wp-content/uploads/2019/10/SMPR-2019_001.pdf
2. Detection of *Salmonella* species in Cannabis and Cannabis Products https://www.aoac.org/wp-content/uploads/2020/07/SMPR-2020_002.pdf
3. Detection of Shiga toxin-producing *Escherichia coli* in Cannabis and Cannabis Products https://www.aoac.org/wp-content/uploads/2021/02/SMPR-2020_012.pdf
   NOTE: A SMPR for Detection of *Listeria monocytogenes* in Cannabis Edible Products will be approved in 2025.

Medicinal Genomics is a member of **AOAC's CASP Microbial Contaminants Working Group**. The goal and objectives of this working group are to:

- Develop Standard Method Performance Requirements (SMPR) for cannabis and hemp
- Extend a Call for Methods for each of the completed SMPRs
- Empanel an Expert Review Panel to review candidate methods
- Deliver consensus-based validated Performance Test Methods (PTMs) & Final Action Official Methods for the cannabis industry

Medicinal Genomics has a single AOAC Certified **qPCR** PTM for the detection of the 4 pathogenic *Aspergillus* species in one test and has a single AOAC Certified **qPCR** PTM for the detection of *Salmonella* spp. & STEC in one test. The sample types for the 4 *Aspergillus* species test are flower, infused products, oils & concentrates, and hemp. Moreover, the sample types for the Sal/STEC test are flowers, oils, chocolates, and hemp. Each of these two **multiplex qPCR assays** were validated by an independent 3rd party cannabis testing laboratory using the various cannabis sample

There are several **major disadvantages** of using plating methods to detect specific bacterial and fungal pathogens:

- Cannabinoids, which can represent up to 30% of a cannabis flower's weight, have been shown to have antibiotic activity. Antibiotics inhibit the growth of bacteria. *Salmonella* & STEC bacteria are very sensitive to antibiotics, which may lead to a false negative result using a plating system *vs.* a positive result using a qPCR method. [36-37]
- The USP stated "Detection of pathogenic *Aspergillus* species using culture based methods is very difficult, requiring a highly trained and experienced mycologist to correctly identify these pathogens by colony appearance and morphology, as there are many nonpathogenic species of *Aspergillus* that may be indistinguishable from those that are pathogenic [31].
- Agar plating methods cannot detect bacterial and fungal endophytes [38-39] that live a part or all of their life cycle **inside** a plant. Examples of endophytes are the *Aspergillus* pathogens. Methods to break open the plant cells to access these endophytes for plating methods also lyses these bacterial and mold cells (killing these cells in the process). Therefore, these endophytes will never form colonies, which will lead to a false negative result using a plating system *vs.* a positive result using a qPCR method.
- Selective media for mold plating methods, such as Dichloran Rose-Bengal Chloramphenicol (DRBC) reduces mold growth; especially *Aspergillus* by 5-fold. This

may lead to a false negative result for this human pathogen. In other words, although DRBC medium is typically used to reduce bacteria; it comes at the cost of missing 5 fold more yeast and molds than Potato Dextrose Agar (PDA) + Chloramphenicol or molecular methods. These observations were derived from study results of the AOAC emergency response validation [40].

Therefore, a rule must be adopted that reads:
An AOAC Certified Performance Tested Method (PTM) that has an enrichment step with a minimum of sixteen hours (16 hrs) of incubation.

Our fourth recommendation is to increase the sample testing size, which is not covered in the regulations. As cannabis prices fall, a 10-gram test amount may become necessary to address sampling challenges. A rule must be adopted, where the maximum batch size for taking samples for subsequent compliance and/or retention testing is 15 lbs. If a lab tests a 1 gram from a 15-pound batch (1 gram from 9,072 grams), this test sample size increases the risk of sample bias. Contaminants like bacteria or fungi in a sample are often not evenly distributed throughout a batch test sample. In a 1-gram sample, there's a higher likelihood that no pathogen is present in the small portion tested, even if it exists elsewhere in the batch. Therefore, MGC suggests larger sample testing size (10 or 25 grams) to enhance one's probability of capturing a more representative portion of the entire batch, reducing the chance of missing contaminated areas.

Our fifth recommendation is:
Implement Species-Specific Testing in Phases: Transitioning to species-specific pathogen testing should follow a phased approach to ensure accuracy, minimize disruption to the cannabis industry, and allow sufficient time for assay development and validation by method developers. These pathogen recommendations are grounded in clinical literature that highlights the potential harm posed by certain cannabis-associated microbes. Prevalence data has been sourced from Simon Fraser University (British Columbia, Canada) and Kannapedia.net, which catalog over >2,200 microbiomes of bacterial, fungal, and viral DNA found on cannabis plants across the U.S. This data helps identify and prioritize the most relevant pathogens for cannabis safety, which supports the need for a targeted testing approach.

This phased strategy will enable Illinois to adopt pathogen testing protocols that are more clinically relevant, focused on consumer safety, and aligned with best practices from other states. Species-specific testing truly protects consumers by differentiating between thousands of non-harmful fungi and molds that pose no risk. California and 23 other US jurisdictions have already adopted this modern approach, which mirrors the protocols used in hospitals to rapidly diagnose multiple pathogens using extensive PCR-based platforms for gastrointestinal and respiratory diseases. By adopting this methodology, Illinois can ensure a more accurate and safety-focused testing regime

Phase 2 - Future Considerations - The following pathogens have been found on cannabis and known to cause clinical harm.

1. *Fusarium falciforme* - Kannapedia.net (https://kannapedia.net/) and References [41-46]; Fusariosis, Skin Infections, Pulmonary Infections, Disseminated Infections, mycotoxins - References [41-42. 47-52]
2. *Fusarium proliferatum* - Kannapedia.net, References [41-46]; Fusariosis, Keratomycosis, Sinusitis, Onychomycosis, Pulmonary Infections, Systemic Infections - References [41-42. 47-52]
3. *Fusarium solani* - Kannapedia.net, References [41-46, 53]; Keratitis, sinusitis, endophthalmitis, onychomycosis, cutaneous infections, mycetoma and arthritis, organ membrane disruption - References [41-42. 47-52]
4. *Fusarium oxysporum* - Kannapedia.net, References [41-46, 53]; Keratitis & onychomycosis in both immunocompetent and immunocompromised - References [41-42. 47-52]
5. *Mucor circinelloides* - Reference [53]; Pulmonary, Cutaneous, Rhinocerebral, Gastrointestinal & Disseminated Mucormycosis - References [54-55]
6. *Mucor racemosus* - References [53]; Pulmonary, Cutaneous, Rhinocerebral, Gastrointestinal & Disseminated Mucormycosis References 54-55]
7. *Penicillium citrinum* - Kannapedi.net, References [41, 50-51, 53]; Hypersensitivity Pneumonitis, mycotoxins, Severe Asthma with fungal sensitization, Occupational Lung disease, mycotoxins, particularly citrinin. Citrinin is a nephrotoxic compound, meaning it can damage the kidneys when ingested. Reference [41-42, 46, 52, 54, 56]
8. *Penicillium expansum* - Kannapedia.net, References [41, 51, 53]; Mycotoxins, particularly patulin, which is harmful if ingested. Patulin is known to cause a variety of adverse health effects, including nausea, gastrointestinal disturbances, and immune suppression. References [41-42, 52, 54]
9. *Penicillium marneffei* - Kannapedia.net, References [40, 50]; Skin lesions, fungemia, pulmonary lesions, anemia. Typically impacts individuals with HIV, hematological malignancies, and immunosuppressive agents. It is the only species in the Penicillium genus known to cause systemic infections in humans - References [41-42, 52, 54, 56]
10. *Candida albicans* - Kannapedia.net; Oropharyngeal candidiasis (oral thrush): Common in those with HIV/AIDS, Vulvovaginal candidiasis (vaginal thrush), Candidemia/disseminated infections, Pneumonia, Meningitis, paronychia, onychomycosis, endocarditis, eye infection, and intertriginous candidiasis - Reference [57]

I thank you for your time and consideration. If you have any questions, please feel free to contact me.

Respectfully,

Sherman Hom, PhD
Director of Regulatory Affairs
Medicinal Genomics Corporation

References

1. M.J. Chusid, J.A. Gelfand, C. Nutter, and A.S. Fauci, Letter: *Pulmonary aspergillosis, inhalation of contaminated marijuana smoke, chronic granulomatous disease. Annals of Internal Medicine* 82(5), 682-683 (1975). https://pubmed.ncbi.nlm.nih.gov/1094876/
2. R. Llamas, D.R. Hart, and N.S. Schneider, *Allergic bronchopulmonary aspergillosis associated with smoking moldy marihuana. Chest* 73 (6), 871-872 (1978). https://journal.chestnet.org/article/S0012-3692(16)61841-X/pdf
3. *Salmonellosis traced to marijuana--Ohio, Michigan. Morbidity and Mortality Weekly Report* 30(7), 77-9 (1981). *https://pubmed.ncbi.nlm.nih.gov/6789127/*
4. S.L. Kagen, *Aspergillus: An inhalable contaminant of marihuana. The New England Journal of Medicine* 304(8), 483–484 (1981).
5. D.N. Taylor, I.K. Wachsmuth, Y.H. Shangkuan, E.V. Schmidt, T.J. Barrett, and J.S. Schrader, et. al., *Salmonellosis associated with marijuana - A multistate outbreak traced by plasmid fingerprinting. The New England Journal of Medicine* 306(21), 1249–1253 (1982). https://www.nejm.org/doi/abs/10.1056/NEJM198205273062101
6. S.L. Kagen, M.D. Viswanath, P. Kurup, P.G. Sohnie, and J.N. Fink, *Marijuana smoking & fungal sensitization. The Journal of Allergy and Clinical Immunology* 71(4), 389–393 (1983).
7. S. Sutton, B.L.Lum, and F.M. Torti, *Possible risk of invasive aspergillosis with marijuana use during chemotherapy for small cell lung cancer. Drug Intelligence & Clinical Pharmacy* 20(4), 289–291 (1986).
8. R. Hamadeh, A. Ardehali, R.M. Locksley, and M.K. York, *Fatal Aspergillosis associated with smoking contaminated marijuana in a marrow transplant recipient. Chest* 94(2), 432–433 (1988).
9. S. M. Levitz, R. D Diamond, *Aspergillosis and marijuana. Annals of Internal Medicine* 115(7), 578-579 (1991). https://www.acpjournals.org/doi/epdf/10.7326/0003-4819-115-7-578_2
10. D.W. Denning, S.E. Follansbee, M. Scolaro, S. Norris, H. Edelstein, and D.A. Stevens, *Pulmonary aspergillosis in the Acquired Immunodeficiency Syndrome. The New England Journal of Medicine* 324(10), 652–664 (1991).
11. W.H. Marks, L. Florence, J. Lieberman, P. Chapman, D. Howard, and P. Roberts, *et. al*., *Successfully treated invasive pulmonary aspergillosis associated with smoking marijuana in a renal transplant recipient. Transplantation* 61(12), 1771–1774 (1996).
12. T. E. Johnson, R. R. Casiano, J. W. Kronish, D. T. Tse, M. Meldrum, and W. Chang, *Sino-orbital aspergillosis in acquired immunodeficiency syndrome. JAMA Ophthalmology* 117(1), 57-64 (1999). https://jamanetwork.com/journals/jamaophthalmology/fullarticle/411373
13. M. Szyper-Kravitz, R. Lang, Y. Manor, and M. Lahav, *Early invasive pulmonary aspergillosis in a Leukemia patient linked to Aspergillus contaminated marijuana smoking. Leukemia & Lymphoma* 42(6), 1433–1437 (2001).

14. D.W. Cescon, A.V. Page, S. Richardson, M.J. Moore, S. Boerner, and W.L., *Invasive pulmonary aspergillosis with marijuana use in a man with colorectal cancer. Journal of Clinical Oncology.* 26(13), 2214–2215 (2008).
15. A. Bal, A.N. Agarwal, A. Das, S. Vikas, and S.C. Varma, *Chronic necrotising pulmonary aspergillosis in a marijuana addict: a new cause of amyloidosis. Pathology* 42(2), 197–200 (2010).
16. Y. Gargani, P. Bishop, and D.W. Denning, *Too many moldy joints - marijuana and chronic pulmonary aspergillosis*. *Mediterranean Journal of Hematology and Infectious Diseases* 3, 2035-3006. Open Journal System (2011).
17. J.L. Pauly and G. Paszkiewicz, *Cigarette Smoke, Bacteria, Mold, Microbial Toxins, and Chronic Lung Inflammation. Journal of Oncology* 819129, 1-13 (2011).
18. R. Ruchlemer, M. Amit-Kohn, and D. Raveh, et. al., *Inhaled medicinal cannabis and the immunocompromised patient. Support Care Cancer* 23(3), 819–822 (2015).
19. B. R. Waisglass, *Aspergillosis spores and medical marijuana. Canadian Medical Association Journal (CMAJ) Letters* 187(14), 1077 (2015). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4592303/pdf/1871077.pdf
20. T. L. Remington, J. Fuller, and I. Chiu. *Chronic necrotizing pulmonary aspergillosis in a patient with diabetes and marijuana use. Canadian Medical Association Journal* 187 (17), 1305-1308 (2015) DOI: https://doi.org/10.1503/cmaj.141412
21. D. Vethanayagam, E. Saad, and J. Yehya, *Aspergillosis spores and medical marijuana. Canadian Medical Association Journal (CMAJ) Letters* 188(3), 217 (2016). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4754188/pdf/1880217a.pdf
22. T. M. Babu, M. K. Griswold, M. A. Urban, and K. M. Babu, Aspergillosis Presenting as Multiple Pulmonary Nodules in an Immunocompetent Cannabis User. Journal of Toxicology and Pharmacology 1(1), 1:004 (2017). https://3402974.fs1.hubspotusercontent-na1.net/hubfs/3402974/Aspergillosis%20Presenting%20as%20Multiple%20Pulmonary%20Nodules%20in%20an%20Immunocompetent%20Cannabis%20 User.pdf
23. A. P, Salam and A. L. Pozniak, Disseminated aspergillosis in an HIV-positive cannabis user taking steroid treatment. The Lancet Infectious Diseases 17(8), 882 (2017). https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(17)30438-3/fulltext
24. M. I. Shafi, S. Liaquat, and D. Auckley, Up in smoke: An unusual case of diffuse alveolar hemorrhage from marijuana. Respiratory Medicine Case Reports 25, 22-24 (2018). https://www.sciencedirect.com/science/article/pii/S221300711830008X?via%3Dihub
25. K. Benedict, G. R. Thompson, and B. R. Jackson, Cannabis Use and Fungal Infections in a Commercially Insured Population, United States, 2016. Emerging Infectious Diseases 26(6), 1308-1310 (2020). https://wwwnc.cdc.gov/eid/article/26/6/19-1570_article
26. V. Zagà, M. Abdelrazek, S. Shalhoub, and M. Mura, Invasive pulmonary aspergillosis in an immunocompetent, heavy smoker of marijuana with emphysema and chronic obstructive pulmonary disease. Canadian Journal of Respiratory, Critical Care, and Sleep

Medicine 5(6), 400- 403 (2021). https://www.tandfonline.com/doi/abs/10.1080/24745332.2020.1777597

27. E. Faccioli, F. Pezzuto, A. D. Amore, F. Lunardi, C. Giraudo, M. Mammana, M. Schiavon, A. Cirnelli, M. Loy, F. Calabrese, and F. Rea, Fatal Early-Onset Aspergillosis in a Recipient Receiving Lungs From a Marijuana-Smoking Donor: A Word of Caution. Transplant International 35(2) (2022). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8883434/pdf/ti-35-10070.pdf
28. L. Khoj, V. Zagà, D. L. Amram, K. Hosein, G. Pistone, M. Bisconti, A. Serafini, L. M. Cammarata, M. S. Cattaruzza, and M. Mura, Effects of cannabis smoking on the respiratory system: A state-of-the-art review. Respiratory Medicine 221(1), (2024). https://pubmed.ncbi.nlm.nih.gov/38056532/
29. A. Anbar, R. Chang, and B. A. Broussard, Unique Case of Chronic Pulmonary Aspergillosis: Unraveling Potential Risk Factors in an Immunocompetent Patient With Marijuana Use and Malnutrition. American Journal of Respiratory and Critical Care Medicine, 209:A2394 (2024) https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2024.209.1_MeetingAbstracts.A2 394
30. PROPOSED REGULATION OF THE CANNABIS COMPLIANCE BOARD OF NEVADA LCB File No. R152-24 August 19, 2025. https://ccb.nv.gov/wp-content/uploads/2025/10/R152-24-CCB-rev-100125.pdf
31. N. D. Sarma, A. Waye, M. A. ElSohly, P. N. Brown, E. Sytze, H.E. Johnson, R. J. Marles, J. E. Melanson, E. Russo, L. Deyton, et.al. *Cannabis Inflorescence for Medical Purposes: USP Considerations for Quality Attributes. Journal of Natural Products* 83(4), 1334–1351 (2020)
32. S. Patel, S. Nguy, and S. Hom. *Compendium and Comparison of State Medical Cannabis Testing. 2019 North American Cannabis Summit*. Los Angeles, CA. January 2019.
33. S. Manur and S. Hom. *Chaos: No standard testing rules, product recalls, and lab shopping/hemp loophole, 129th Association of Food and Drug Officials Educational Conference.* Dallas, TX. June 2025.
34. American Herbal Pharmacopoeia's *Cannabis Inflorescence Cannabis spp.* Monograph https://herbal-ahp.org/online-ordering-cannabis-inflorescence-qc-monograph/
35. [No reference]
36. J.A. Karas, L.J.M. Wong, O.K.A. Paulin, A.C. Mazeh, M.H. Hussei, J. Li, and T. Velkov, *The Antimicrobial Activity of Cannabinoids. Antibiotics* 9(7), 406 (2020). https://doi.org/10.3390/antibiotics9070406
37. L. Gildea , J. Ayariga, J. Xu , R. Villafane, R. Boakai, M. Samuel-Foo, O. Ajayi, *Cannabis sativa CBD Extract Exhibits Synergy with Broad-Spectrum Antibiotics against Salmonella typhimurium*. https://www.preprints.org/manuscript/202209.0143/v1

38. M. Taghinasab and S. Jabaji, *Cannabis microbiome and the role of endophytes in modulating the production of secondary metabolites: an overview. Microorganisms* 2020, 8, 355, 1-16 (2020).
39. P. Kusari, S. Kusari, M. Spiteller and O. Kayser, *Endophytic fungi harbored in Cannabis sativa L.: diversity and potential as biocontrol agents against host plant-specific phytopathogens. Fungal Diversity* 60, 137–151 (2013).
40. K. McKernan, Y. Helbert, L. Kane, N. Houde, L. Zhang, and S. McLaughlin, *Whole genome sequencing of colonies derived from cannabis flowers & the impact of media selection on benchmarking total yeast & mold detection tools* [version 2; peer review: 2 approved]. *F1000Research*: https://f1000research.com/articles/10-624
41. A.M. Altibi, R. Sheth, A. Battisha, and V. Kak, *Cutaneous Fusariosis in a Patient with Job's (Hyper-IgE) Syndrome* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7315260/
42. G. Casalini, A. Giacomelli, S. Antinori, *The WHO fungal priority pathogens list: a crucial reappraisal to review the prioritization*, - https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(24)00042-9/fulltext
43. Z.K. Punja, N. Li, and A.J. Roberts, *The Fusarium solani species complex infecting cannabis (Cannabis sativa L., marijuana) plants and a first report of fusarium (Cylindrocarpon) lichenicola causing root and crown rot. Can. J. Plant Pathology* 43, 567–581. (2021). doi: 10.1080/07060661.2020.1866672
44. T. Mok, A.P. Koehler, M.Y. Yu, D.H. Ellis, P.J. Johnson, and N.W. Wickham, *Fatal Penicillium citrinum pneumonia with pericarditis in a patient with acute leukemia* https://journals.asm.org/doi/abs/10.1128/jcm.35.10.2654-2656.1997
45. T.J. Walsh, A. Groll, J. Hiemenz, R. Fleming, E. Roilides, and E. Anaissie, *Infections due to emerging and uncommon medically important fungal pathogens*, https://onlinelibrary.wiley.com/doi/full/10.1111/j.1470-9465.2004.00839.x
46. A. Rokas, *Evolution of the human pathogenic lifestyle in fungi*, https://www.nature.com/articles/s41564-022-01112-0
47. J.-Y. Kim, C.-I. Kang, J.H. Lee, W.J. Lee, K. Huh, S.Y. Cho, D.R. Chung, K.R. Peck, *Clinical Features and Outcomes of Invasive Fusariosis: A Case Series in a Single Center with Literature Review* https://pubmed.ncbi.nlm.nih.gov/34227751/
48. B.G. Batista, M.A. de Chaves, P. Reginatto, O.J. Saraiva, and A.M. Fuentefria, *Human fusariosis: An emerging infection that is difficult to treat*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7269539/
49. G. Krishnan, A. Pande, *Fusarium Infections in Patients with Hematological Malignancies*, https://academic.oup.com/ofid/article/8/Supplement_1/S583/6450765
50. K. D. Gwinn, M.C.K. Leung, A.B. Stephens, Z.K.. Punja, *Fungal and mycotoxin contaminants in cannabis and hemp flowers: implications for consumer health and directions for further research*, https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2023.1278189/full

51. K. McKernan, J. Spangler, L. Zhang, V. Tadigotla, Y. Helbert, T. Foss, and D. Smith, *Cannabis microbiome sequencing reveals several mycotoxic fungi native to dispensary grade Cannabis flowers*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4897766/
52. M.A. Egbuta, M. Mwanza, and O.O. Babalola, *Health Risks Associated with Exposure to Filamentous Fungi*, https://www.mdpi.com/1660-4601/14/7/719
53. Z.K. Punja and C. Scott, *Organically grown cannabis (Cannabis sativa L.) plants contain a diverse range of culturable epiphytic and endophytic fungi in inflorescences and stem tissues,* https://cdnsciencepub.com/doi/full/10.1139/cjb-2022-0116
54. D.P. Kontoyiannis & R.E. Lewis, *Invasive zygomycosis: update on pathogenesis, clinical manifestations, and management, Clinical Infectious Diseases*, 42(5), 1137-1145. (2006). https://www.sciencedirect.com/science/article/abs/pii/S0891552006000535?via%3Dihub
55. M.M. Roden, T.E. Zaoutis, W.L. Buchanan, *et al.*, *Epidemiology and outcome of zygomycosis: a review of 929 reported cases. Clinical Infectious Diseases*, 41(5), 634-653 (2005). https://pubmed.ncbi.nlm.nih.gov/16080086/
56. C. Lass-Flörl, A.-M. Dietl, D. P. Kontoyiannis, and M. Brock, *Aspergillus terreus Species Complex,* https://journals.asm.org/doi/full/10.1128/cmr.00311-20
57. *Candidiasis of the tongue in cannabis users: a report of 2 cases* https://pubmed.ncbi.nlm.nih.gov/32857052/

Dr. Sherman Hom - Cannabis Industry Experience

In 2012 at the New Jersey Department of Health, Division of Public Health and Environmental Laboratories, Dr. Hom was the Project Manager that led a team of expert analytical chemists that started the first Cannabis Testing Laboratory in support of the State's Medical Cannabis Program. The team validated methods for the quantitation of eight (8) cannabinoids using HPLC UV-DAD, various heavy metals using ICP-MS, and various aflatoxins & ochratoxin A using affinity chromatography & HPLC MS.

From 2019 to 2021, Sherman was the Project Manager of a team that started the Cannabis Microbial Testing Lab and validated qPCR methods to detect shiga toxin producing *E. coli* (STEC), *Salmonella* spp., and the four human pathogenic species of *Aspergillus* (*A. flavus, A. fumigatus, A. niger,* and A. *terreus*).

From 2017 to 2021, he led a team that created the first continuously updated Medical Cannabis Testing Regulations by State. Comparative analyses were performed to make general observations and identify gaps & trends in the testing rules. For example in 2019, a literature search identified 25 chemical pesticides that were detected in a cannabis marketed product. Of these 25 pesticides, nine pesticides were not required to be tested by any state, while the other sixteen pesticides were required to be tested by various fractions of the states. Moreover in 2019, sixteen (16) of 27 states (59%) had a unique set of microbial testing regulations.

Since May 2021, Dr. Hom has been the Director of Regulatory Affairs at Medicinal Genomics Corporation (MGC), which markets genetics-based cannabis tests and breeding technologies. His primary responsibility is to make recommendations concerning microbial contamination testing and other related testing regulations to US state, Washington D.C., US territory, tribal nations within US borders, and country regulatory and legislative officials that are tasked with either drafting and/or modifying cannabis, hemp, and psychedelic mushroom regulations and bills to ensure safe products for patients and consumers. Approximately 75% of the US jurisdictions have partially or fully adopted MGC's cannabis microbial contamination testing regulations based on scientific principles.

Another major task is to continuously update MGC's Cannabis Microbial Testing Regulations by US State, Washington D.C., Territory, and tribal nations. (https://www.medicinalgenomics.com/cannabis-microbial-testing-regulations-by-state/). Comparative analyses of the microbial testing rules for the cannabis product types (plant material, concentrates, edibles, and infused-products non-edible) by state have been performed to provide information concerning general observations, identify gaps, and trends over the previous 7 years.

A third task is the creation of cannabis standards. Sherman supports the AOAC's Cannabis Analytical Science Program (CASP), the National Cannabis Laboratory Council, ASTM International D37.03 Cannabis Committee's Laboratory Subcommittee and the Association of Food and Drug Officials Cannabis, Hemp, and Natural Medicine's Committee.

Dr. Hom is the microbial contamination testing subject matter expert for the One Plant Policy Team that is drafting a whitepaper for cannabis policy standardization for the United States and other interested countries.

Lastly, Sherman has proposed next steps in providing the genomic data from cannabis flower microbiome research study to support a panel of national, regional, state, or country subject matter experts in various fields to engage in a dialogue to propose a consensus set(s) of cannabis microbial contaminant testing rules. The technology to obtain this genomic data has been developed by the MGC R&D team.

He has a B.A. in Biology from the University of California at San Diego, a Ph.D. in Microbiology from University of California at Davis, and was a Postdoctoral Fellow in Molecular Microbiology at the Department of Biology, The John Hopkins University (Baltimore, MD).

Public Comment – LCB File No. R152-24P

November 18, 2025

Northwest Confections Nevada, LLC dba WYLD

Northwest Confections Nevada, LLC, dba WYLD, would like to thank the Cannabis Control Board (CCB) for the acceptance and consideration of comments regarding the proposed rules LCB File No. R152-24 posted on August 19, 2025.

WYLD has operated in the state of Nevada since 2017, specializing in the production of gummy edible cannabis products with a variety of options to choose from.

Drawing from experience in regulated cannabis markets across the country, we hope that the following comments are taken into consideration. Our intent is to bolster the success of Nevada's cannabis industry without imposing undue burdens on license holders, while still protecting public health and safety.

Thank you for your time and consideration.

Proposed Rules: Matter in ***italics*** is new; matter in brackets ~~[omitted material]~~ is material to be omitted.

Requested Revisions: **in red bold and underlined**

Fruit on Branded Merchandise

Language as Proposed:

Sec. 54. NCCR 7.030

1. ~~[A]~~ ***Except as otherwise provided in subsection 3, a*** cannabis sales facility shall only offer for sale ~~[cannabis, cannabis]~~ :

... (d) ***Cannabis-related*** accessories, ~~[products]~~ ***including***:

... ***(4) Branded merchandise;***

... 4. A cannabis sales facility shall not sell ~~[any]~~ :

... ***(c) Any cannabis-related accessory which:***

(1) Appeals to children;

(2) Depicts an image of a cartoon character, mascot, action figure, balloon, fruit or toy; or

(3) Is modeled after a product which is primarily consumed by or marketed to children.

... ***6. As used in this section, "branded merchandise" means any item which is not cannabis or a cannabis product and which contains the logo or other branding of a cannabis sales facility, including, without limitation, an article of clothing, pen, bag or other similar item that contains such a logo or such branding.***

Please reconsider including "fruit" as a prohibited depiction on Branded Merchandise in proposed rule 4(c)(2). Fruit that is used to showcase the flavors of cannabis products and depicted in a manner that is not cartoon-like should be allowed on Branded Merchandise items, including articles of clothing, pens, lanyards, etc.

Fruit that is depicted in a cartoonish manner, such as anthropomorphized with smiley faces and arms and legs, should be prohibited for the purposes of public health and safety because they appeal to children. Thankfully, any anthropomorphized cartoon-like versions of fruit would be considered a "cartoon character" and be a prohibited depiction under the proposed language in 4(c)(2).

Branded Merchandise, as used in the rule section 54, is not allowed to include cannabis or cannabis products. Children are not at risk of ingesting cannabis if an article of clothing or a pen depicts fruit in a manner to showcase flavors.

Focusing on the prohibition of depictions of cartoons and cartoon characters on Branded Merchandise is critical for public health and safety with regards to appealing to children. As currently proposed, cartoon-like fruit will already be in violation of the prohibition of depictions of a "cartoon character". Please remove the prohibition of all depictions of "fruit" on Branded Merchandise from the proposed rules.

Requested Change to Language:

Sec. 54. NCCR 7.030

4. A cannabis sales facility shall not sell ~~[any]~~ :

... ***(c) Any cannabis-related accessory which:***

(1) Appeals to children;

(2) Depicts an image of a cartoon character, mascot, action figure, balloon, ~~[fruit]~~ or toy; or

Packaging & Labeling Warning Alignments

Language as Proposed:

Sec. 76. NCCR 12.015 is hereby amended to read as follows:

1. ~~[Any edible]~~ ***Except as otherwise provided in NCCR 12.040, any*** cannabis ***or cannabis*** product ~~[containing]~~ ***sold by a*** cannabis ***establishment*** must:

(a) Be clearly and unambiguously packaged as cannabis with the words ***"THIS PRODUCT CONTAINS CANNABIS"*** and ~~[includes]~~ the warning ***"KEEP OUT OF REACH OF CHILDREN"*** in bold type that clearly identifies that the product contains cannabis.

...

Sec. 80. NCCR 12.040 is hereby amended to read as follows:

1. ~~[A]~~ ***If not already included on the container or package, a*** cannabis sales facility and cannabis consumption lounge must affix to ~~[,]~~ ***or*** include with ~~[, or supply through an electronic medium approved by the appropriate board agent]~~ each container or package containing useable cannabis sold at retail ...a label which must not mislead consumers and must include, without limitation:
...[~~(k)~~] ***(g)*** A warning that states: "THIS PRODUCT CONTAINS CANNABIS."; ***and***
... ***(h)*** A warning that states: "Keep out of Reach of Children."

...

Sec. 81. NCCR 12.045 is hereby amended to read as follows:

1. ~~[A]~~ ***If not already included on the container or package, a*** cannabis sales facility and cannabis consumption lounge must affix to ~~[,]~~ ***or*** include with ~~[, or supply through an electronic medium approved by the appropriate board agent]~~ each container or package containing cannabis products sold at retail ...a label which must not mislead consumers and must include, without limitation:
...[~~(o)~~] ***(l)*** A warning that states: "Keep out of Reach of Children"***; and***
... ***(m)*** A warning that states: "THIS PRODUCT CONTAINS CANNABIS."

The required warnings "This product contains cannabis" and "Keep out of reach of children" are different in all three of the proposed language sections 76, 80, and 81. Please align these sections so the warnings are the same in all sections.

Sec. 76 requires all packaging to have both of these warnings (1) in **BOLD,** (2) in ALL CAPS and *italicized* visually in the rule language, but it is not stated that italics or all caps is required, and (3) written with no periods on either warning.

In Sec. 80 for usable cannabis that does not already have the warnings, they are required to be affixed. But the rule language is (1) not in bold or italicized for either, (2) only ALL CAPS for one, and (3) a period used in both.

In Sec. 81 for cannabis products that do not already have the warnings, the warnings are also required to be affixed. But the rule language is (1) not in bold or italicized for either, (2) only ALL CAPS for one, and (3) a period used only in one warning.

Please support the industry's easy understanding of what correct and compliant packaging requires by amending the rules to clearly align which stylized version of the above warnings are desired by the CCB to be displayed on the packaging.

Requested Change to Language:

Sec. 76. NCCR 12.015 is hereby amended to read as follows:

2. ~~[Any edible]~~ ***Except as otherwise provided in NCCR 12.040, any*** cannabis ***or cannabis*** product ~~[containing]~~ ***sold by a*** cannabis ***establishment*** must:
   (a) Be clearly and unambiguously packaged as cannabis with the words ***"***<u>**THIS PRODUCT CONTAINS CANNABIS.**</u>" and ~~[includes]~~ the warning ***"***<u>**KEEP OUT OF REACH OF CHILDREN.**</u>***"*** in bold type that clearly identifies that the product contains cannabis.

...

Sec. 80. NCCR 12.040 is hereby amended to read as follows:

2. ~~[A]~~ ***If not already included on the container or package, a*** cannabis sales facility and cannabis consumption lounge must affix to ~~[,]~~ ***or*** include with ~~[, or supply through an electronic medium approved by the appropriate board agent]~~ each container or package containing useable cannabis sold at retail ...a label which must not mislead consumers and must include, without limitation:
   ...[~~(k)~~] ***(g)*** A warning that states: "<u>**THIS PRODUCT CONTAINS CANNABIS.**</u>"; ***and***
   ... ***(h)*** A warning that states: "<u>**KEEP OUT OF REACH OF CHILDREN.**</u>"

...

Sec. 81. NCCR 12.045 is hereby amended to read as follows:

2. ~~[A]~~ ***If not already included on the container or package, a*** cannabis sales facility and cannabis consumption lounge must affix to ~~[,]~~ ***or*** include with ~~[, or supply through an electronic medium approved by the appropriate board agent]~~ each container or package containing cannabis products sold at retail ...a label which must not mislead consumers and must include, without limitation:
   ...[~~(o)~~] ***(l)*** A warning that states: "<u>**THIS PRODUCT CONTAINS CANNABIS.**</u>" ***; and***
   ... ***(m)*** A warning that states: "<u>**KEEP OUT OF REACH OF CHILDREN.**</u>"

November 19, 2025

Cannabis Compliance Board
700 Warm Springs Road, Suite 100
Las Vegas, NV 89119
Via email to: Regulations@ccb.nv.gov

Subject: Hearing on Notice to Adopt Changes to NCCR 1, 4, 5, 6, 7, 11, 12, 13 & 15

Dear Cannabis Compliance Board Members and Director Humm,

On behalf of the members of the Nevada Cannabis Association, we submit the following comments regarding the proposed regulations noticed for adoption on November 20, 2025.

In June 2024, the Board approved a version of the Nevada Cannabis Compliance Regulations (NCCRs) substantially similar to the current proposal. In most sections, while phrasing has been refined, the regulatory intent and outcome remain consistent. However, Section 61 of the proposed regulations represents a substantive departure from the prior version and does not meet the notice requirements of NRS 233B.040(3), NRS 233B.0608, and NRS 233B.061.

I. Procedural Concerns under NRS 233B.040(3), NRS 233B.0608 and NRS 633B.061

Section 61 adopts by reference 37 standards, manuals, and technical documents published by private organizations.

Adoption of outside materials by reference is permitted under the Nevada Administrative Procedure Act (APA); however, in order to adopt by reference agencies must follow the notice requirements of NRS 233B. Under NRS 233B.040(3), an agency may adopt outside materials by reference only if it: files one copy with the Secretary of State and one with the State Library, Archives, and Public Records Administrator; makes at least one copy available for public inspection with its regulations; and clearly discloses the source and purchase price of the publication.

These procedural safeguards ensure transparency and meaningful public participation in rulemaking. In this case, nearly one-third of the 37 incorporated documents are not publicly accessible; nine are behind paywalls (costing up to $1,000); one has not even been published yet. This creates a situation where licensees will be legally bound to comply with detailed technical provisions that they cannot freely access or meaningfully review during the rulemaking process.

In the prior version of these regulations approved by the Board in 2024, the language used with respect to most of the referenced documents was “Each cannabis testing laboratory must…[a]dhere to… .” The regulations did not use the language “adopt by reference,” which would have signaled that these standards were intended to become fully part of the regulations and would apply to all licensees.

Because the October 2025 notice was the first draft to use “adopt by reference” rather than “adhere to,” small businesses completing the April 7, 2024 impact survey would not have known that thousands of pages of third-party materials would later be incorporated into binding regulation. Further, licensees other than laboratories had no notice that the referenced standards would be applicable to them. This conflicts with the purpose of NRS 233B.0608, which requires

that small businesses be given a genuine opportunity to understand and comment on potential economic impacts. Further, requiring licensees to purchase and maintain multiple publications itself imposes undue financial and administrative burdens on small businesses. As a result, the small business impact statement is inaccurate, incomplete, and does not adequately consider the economic effect of the regulation on small businesses. Similarly, the notice requirements of NRS 233B.061 have not been met because interested persons have not been "afforded a reasonable opportunity to submit data, views, or arguments upon a proposed regulation, orally or in writing."

At a minimum, referenced documents should be made available during rulemaking to meet NRS 233B notice requirements. Further, to ensure clarity and increase compliance, dense technical publications should not be incorporated by reference. Adopting thousands of pages of third-party treatises "by reference" is likely to lead to uncertainty, confusion, and ultimately, lack of compliance. The key methodologies or definitions should be written directly into the NCCRs, rather than adopting entire documents wholesale. This allows Nevada to align with national standards and expertise while keeping the NCCRs self-contained and publicly accessible to those who are expected to comply.

II. Section 68(3), the ASTM Standard, and Proposed Regulation Changes Contain Conflicting Language

The CCB has indicated (through regulations to be workshopped on November 19, 2025) that it interprets ASTM D8334/D8334M to require a 60-gram sample size. However, Section 68(3) of these proposed regulations changes the sample size from 10 to 20 grams. If the regulation and the standard point to different sample sizes, which does a licensee follow?

III. Section 68(3) Conflicts with Senate Bill 157

Section 68(3) increases the sample size for testing to 20 grams, regardless of the size of the lot being tested. This proposed change to the regulation was approved in June 2024, prior to the passage of Senate Bill 157 in 2025. Senate Bill 157 stated that:

> *(c) For each lot of cannabis flower, the total aggregate weight of all representative samples to be collected for testing from the lot to be:*
> *(1) For a lot weighing less than 5 pounds, not less than 10 grams;*
> *(2) For a lot weighing 5 pounds or more but less than 10 pounds, not less than 15 grams; and*
> *(3) For a lot weighing 10 pounds or more but not more than 15 pounds, not less than 20 grams.*

The Legislature's clear intent was to increase the sample size proportionate to the size of the lot. This is evident not only from the language of the statute itself but also from extensive testimony during committee hearings on the bill:

> "We have worked on evolving the language, going from 5 to 10, 10 to 20 pounds. But, the goal is to have progressively larger sample sizes along the way. This is existing regulatory language in Washington State around their cannabis testing lot sizes. We used that as the base because we felt like that was a very good scientific standard to grow from."

-Will Adler, Senate Commerce and Labor Committee, March 5, 2025

> "Specifically, the ASTM standard on sampling cannabis flower—which is known as D8334—goes a long way in solving this problem. It incorporates best practices from the European Medicines Agency, U.S. Pharmacopeia and other botanical medicine research organizations. It lays out clear protocols on how much sample to prepare, which parts of the lot—regardless of lot size—to sample so that we are not cherry-picking. Also it ensures that as the lot size increases—from 5- to 10- to 20- to 50-pound lots—the number of samples scale too. Nevada already has this in regulation; the minimum limit that you have to sample in order to have a representative sample of the lot is around 0.5 percent. So the increase in the sample size commensurate with lot size, combined with requiring sampling from those different parts of the containers, ensures that if there is localized contamination, it does not get diluted and missed."

-David Vaillencourt, Senate Commerce and Labor Committee, March 5, 2025

In fact, proportionate sampling in relation to lot size was such a centerpiece of the discussion of SB 157 that opponents to the proposed lot size changes submitted an exhibit arguing against the methodology. *See: Proposed Lot Size Changes submitted by Eduardo Martinez, Public Affairs Director, Western Public Affairs, Assembly Judiciary Committee, April 29, 2025.*

It is abundantly clear that the Legislature intended to scale sample sizes to lot sizes. The proposed 20-gram sample size does not carry out that legislative intent.

IV. Labeling Requirements in Section 81 Should be Effective No Earlier than 12 Months from Adoption

Section 81 will change NCCR 12.045(1)(f) to require licensees to list the detected cannabinoid profile and terpenoid profile of the top three terpenes, if detected. Most products on shelves today do not contain this information on their labels; thus, the CCB should either adjust the effective date of this section to allow at least one year to sell through existing inventory while changing labels on newly packaged products, or provide guidance to licensees along these lines.

IV. Conclusion

The Nevada Cannabis Association and its members support science-based regulation and alignment with national standards where appropriate. However, transparency, accessibility, and statutory consistency are essential to lawful and effective rulemaking.

Until the referenced documents are made available for review, comment, and to ascertain economic impact, the CCB should defer adopting Section 61 because it has not been properly noticed. (Sections 65(1), 66(15) and 71(2)(b) contain cross-references to the standards adopted in Section 61.) Licensees must have a meaningful opportunity to evaluate and comment on the true economic and operational impact of these requirements. It should also be considered as a policy question whether adopting thousands of pages of third-party materials by reference provides licensees with clear and ascertainable rules to follow.

Further, the CCB should delete the proposed sample size increase or defer adoption of Section 68(3) until conflicts with Senate Bill 157 are resolved.

With the exception of these specific sections, we support adoption of the remainder of the regulations so the long-awaited changes to the NCCRs can take effect without further delay.

Respectfully,

Layke A. Martin, Esq.
Executive Director
Nevada Cannabis Association

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Wednesday, November 19, 2025

Nevada Cannabis Compliance Board
700 East Warm Springs Road, Suite 100
Las Vegas, NV 89119
Via email: ccbmeetings@ccb.nv.gov

Re: Green Thumb Industries Inc. Input on Proposed Changes to NCCR 1, 4, 5, 6, 7, 11, 12 & 13

Dear CCB Staff and Executive Director Humm,

On behalf of Green Thumb Industries Inc. ("GTI"), I respectfully submit these written comments in response to proposed amendments to the Nevada Cannabis Compliance Regulation ("NCCR"). As a longstanding licensee, GTI has a vested interest in the success of Nevada's' cannabis program and supports policies that are fair and equitable to cannabis industry participants. We appreciate the opportunity to provide suggestions to further clarify the intent and spirit of the proposed regulations.

Below please find our detailed input on the proposed changes to NCCR 1, 4, 5, 6, 7, 11, 12 and 13, as well as our basis for requesting same. Please do not hesitate to reach with any questions or concerns.

I. Category I Violations: NCCR 4, Section 14(b)(2)

The proposed change to NCCR 4, Section 14(b)(2) identifies a single instance of "diversion of cannabis or a cannabis product" as a Category 1 Violation in subsection (b). Given the specifically defined nature of a Category I violation as events "which are of a severity that precludes the continuing operations of a cannabis establishment or the maintenance of a cannabis establishment agent registration card," the inclusion of a single instance of diversion appears disproportionate to the violation category. While GTI recognizes the seriousness of any diversion, we respectfully recommend modifications to the language to further specify diversion events that rise to the level of severity described in Category I:

Recommended text: "(b) Category I violations include, without limitation: […] (2) a pattern of diversion of cannabis or cannabis products, including but not limited to more than one diversion event over a 90-day period."

By revising the language to require more than a single instance of diversion, the Cannabis Compliance Board ("CCB") will have increased ability to investigate events that rise to the severity level of a Category 1 violation, such as the other expressly identified example of "Conviction of an excluded felony offense, as defined in NRS 678B.050." The revised language increases the proportionality of the violation to the consequences of same, namely discontinued operations or loss of an agent registration card.

GTI supports the inclusion of a single instance of diversion as a Category II violation.

II. Visitor Logs: NCCR 4, Section 14(b)(2) and (8)

The proposed change to NCCR 4, Section 14(b)(2) identifies a single instance of "failing to maintain a visitor log as required by NCCR 6.070" as a Category VII violation. Category VII violations are defined as events "which are inconsistent with the orderly regulation of the sale or production of cannabis or cannabis products and of a less serious nature than a category VI violation as described in NCCR 4.060." GTI recognizes that a repeated failure to compliantly maintain visitor logs creates inconsistencies that impact the orderly regulation of licensed entities. However, an isolated failure to maintain a visitor log is does not rise to the level of a Category VII violation.

> Recommended text: "(3) Repeated failure to maintain a visitor log as required by NCCR 6.070."

By revising the language to require more than a single instance of failure to maintain a visitor log, the Cannabis Compliance Board ("CCB") will mitigate the burden of addressing minor compliance violations that could be attributed to human error and focus on other instances that significantly impact the orderly regulation of the sale or production of cannabis or cannabis products.

For the same reasons described above, and with the goal of proportionality with respect to category of violations and the underlying act giving rise to the violation, GTI also recommends revising the language included in NCCR 4, Section 14(b)(8) to increase the variance of total inventory of cannabis:

> Recommended text: "(8) Any variance of more than 0.75 percent of the total inventory of the cannabis establishment which is documented."

III. Three Year Look Back Period for Violations: NCCR 4, Section 15(1)(b)(3) and (8); NCCR 4, Section 15(2)(a) and NCCR 4.035, Section 2(b) and (c)

GTI respectfully suggests decreasing the look back period set forth in NCCR 4, Section 15(2)(a)-(f) from three years to one year. These sections specifically dictate the type of penalties applicable for multiple Category VII violations, such as:

Before consideration of the factors described in subsection 3 of NCCR 4.030, the Board or hearing officer will presume that the following are appropriate penalties for a category VII violation: ***(a) For the first or second category VII violation in the immediately preceding 3 years, a written formal warning.***

NCCR 4, Section 15(2)(a); see also (b)-(f). By limiting the look back period to one year instead of three years, the CCB will continue to be able to issue formal warnings to repeat offenders while also minimizing their administrative burden. The limited look back period also positively impacts stakeholders from punitive measures based on occurrences outside a one year period.

> Recommended text: "Before consideration of the factors described in subsection 3 of NCCR 4.030, the Board or hearing officer will presume that the following are appropriate penalties for a category VII violation: (a) For the first or second category VII violation in the immediately preceding year, a written formal warning.

These comments apply equally to the three-year look back periods set forth for Category II, III and IV Violations.

Green Thumb

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IV. Unlicensed Cannabis Activity: NCCR 4, Section 18(2)(b) and (4)(a)

NCCR 4, Section 18(2)(b) now includes specific examples of false, misleading or deceptive statements concerning the nature of cannabis-related products, such as a representation that a "product containing a synthetic cannabinoid and a commodity or product containing hemp, as defined by NRS 557.160, which exceeds the maximum THC concentration established by the State Department of Agriculture for hemp, in connection with the sale or the offer to sell such a product." The penalty related to this unlicensed activity is set forth in Section 4(a), and calls for seizure and destruction of any cannabis or cannabis product found in the possession of the person to whom the notice and order was issued.

GTI is completely aligned with the prohibition of false and misleading statements concerning cannabis products but has concerns relative to the imposition of severe penalties, such as seizure in destruction, in the event that product containing a synthetic cannabinoid or hemp exceeds the maximum THC concentration established by the State Department of Agriculture. These concerns arise out of the fact that variances can occur in testing, or in the event that there is excessive THC concentration, it can be cured through remediation. GTI proposes the following text:

> Recommended text: "Makes any false, misleading or deceptive statement or representation concerning the nature of a cannabis-related product.~~, including, without limitation, a product containing a synthetic cannabinoid and a commodity or product containing hemp, as defined by NRS 557.160, which exceeds the maximum THC concentration established by the State Department of Agriculture for hemp, in connection with the sale or the offer to sell such a product."~~

The proposed revision allows CCB to enforce penalties for any false, misleading or deceptive statements related to cannabis products, which could include representations related to maximum THC concentration, without having it identified as a per se violation.

V. Category II Violations: NCCR 4.035(b)(2)

Section (b)(2) of NCCR 4.035 includes "operating without all required permits, certificates, registrations [and/or] and licenses including, without limitation, a business license, a special land use permit or any permit required by the Department of Taxation" a Category II violation. GTI recognizes the seriousness of any licensees operating without all attendant approvals while also recognizing that events outside of licensees' control can impact timelines of approvals, particularly at the local level. To accommodate unforeseen delays, outside the control of licensed entities, GTI suggests the following:

> Recommended text: "Operating without all required permits, certificates, registrations [and/or] and licenses <u>in excess of 30 days</u> including, without limitation, a business license, a special land use permit or any permit required by the Department of Taxation."

VI. Category III Violations: NCCR 4.040(b)(9)

GTI recommends that the CCB include a specific carveout with respect to Category III violations for "failing

to install video cameras as required by NCCR 6.085" to clarify that uncontrollable events, such as unanticipated camera outages or insufficient coverage range are not considered Category III violations. The proposed language appears to communicate that installation failure will result to violations, and GTI offers the following language to ensure that both the letter and spirit of the law are clearly articulated to support licensee compliance:

> Recommended text: "(9) Failing to install video cameras as required by NCCR 6.085. Intervening and unanticipated camera issues unrelated to installation are expressly excluded.

VII. Required Disclosures: NCCR 12(2)

The proposed revisions to NCCR 12 include the following language:

Upon request, a cannabis sales facility or cannabis consumption lounge shall immediately provide the disclosure provided by a cannabis cultivation facility or cannabis production facility pursuant to subsection 1 to the consumer or patient through any of the following means:

(a) A paper copy of the disclosure.
(b) An electronic copy of the disclosure.
(c) Inclusion on the package or label provided to the consumer.

GTI suggests the following language to clarify that the licensee has the ability to determine the manner in which the disclosure is provided:

Recommended text: Upon request, a cannabis sales facility or cannabis consumption lounge shall immediately provide the disclosure provided by a cannabis cultivation facility or cannabis production facility pursuant to subsection 1 to the consumer or patient by utilizing, at its discretion, any of the following means: (a) A paper copy of the disclosure; (b) An electronic copy of the disclosure; (c) Inclusion on the package or label provided to the consumer.

* * *

/s/ Rebecca Brown
Rebecca Brown
Green Thumb Industries Inc.

Section 14

Comment: Is there a qualification requirement for the "hearing officer employed by the Board?" Any provisions on issues such as recusal?

Section 61

Comment: Were those 37 of references adopted by the NCCR. added in this revision while many of them were not in the previous versions of LCB Files. That nullifies the small business impact statements based on the previous versions of the LCB files.

Section 68 and *Section 71*

p. 129 NCCR 11.050.7 A cannabis independent testing laboratory shall, upon request, provide the final certificate of analysis to the Board…within 2 business days after the request is received.

p.135 NCCR 11.070.8 A cannabis independent testing laboratory shall file with the Board…an electronic copy of the certificate of analysis for all…regardless of the outcome of the test, including all testing required by NCCR 11.050 to 11.065, inclusive.

Comment: the requirement of "within 2 business days" in 11.050.7 does not consider if the required testing is completed with outcome. Additionally, 11.050.7 is redundant since 11.070.8 requires electronic copy of CoAs shall be filed with the Board.

Section 69

NCCR 11.060 is hereby amended to read as follows

P.130…

3. The cannabis independent testing laboratory shall verify the homogeneity of the potency of the edible cannabis products only if:

(a) The concentration of THC of each sample is within 15 percent above or below the intended concentration of THC;…

Comment: As written, when a concentration of THC of each sample is not "within 15 percent above or below the intended concentration of THC", **NO** verification of the homogeneity of the potency of the edible cannabis products?

Section 71.

NCCR 11.070.2 A cannabis independent testing laboratory that collects a sample pursuant to this section shall:

pp.132-133

(a) Test…
(b) When…
(c) Provide the person who is collecting the sample with access to a hand-washing sink.
(d) Maintain video camera coverage of the sampling process.

Comment: The two items identified in red are impossible for a cannabis independent testing laboratory to comply. These items SHOULD be provided by the cannabis cultivation/production facilities where the lab samplers are conducting sampling. A cannabis independent testing laboratory has no control over the cultivation/production facility layout or the operation of their video camera coverage.

Section 71.

p.136

11.070.8(b) If the certificate of analysis

…

(2) Is from a retesting of a failed sample, the electronic copy of the certificate of analysis must:

…

(II) Be accompanied by the retest approval for the sample issued by the Board agent to the cannabis independent testing laboratory and a list of samples pertaining to the retest approval.

Comment: The additional information required by 11.070.8(b)(2)(II) will create complication for an "electronic" CoA from the independent testing laboratories. It is uncertain how the mechanism will work between the lab and the Board designated seed-top-sale tracking system.

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November 14, 2025

Sent Via Email

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Re: Implementation of Nevada Senate Bill 157 and LCB File No. R152-24 - Constitutional, Scientific, and Regulatory Deficiencies in Cannabis Testing Requirements

Dear Ms. Cronkhite,

Attached to this correspondence is a comprehensive review and analysis of Nevada Senate Bill 157 and LCB File No. R152-24 ("The Brief") for the CCB's review. The Brief has been approved by the following laboratories: 374 Labs, LLC, G3 Labs, LLC, MA and Associates, LLC, ERP, LLC, NV Cann Labs, LLC, RSR Analytical Laboratories, and DPL Nevada LLC dba Digipath Labs. The foregoing laboratories request you take the Brief into consideration when evaluating the implementation of SB 157 and LCB File No. R152-24.

In addition to the Brief, I have attached an executive summary as well. The Nevada laboratories look forward to working with the CCB through the issues identified in the Brief. Please include the Brief and Executive Summary in the materials for the upcoming workshop next week.

Sincerely,

Adam Fulton

Adam R. Fulton, Esq.

Executive Summary

Nevada Senate Bill 157 and LCB File No. R152-24

Constitutional, Scientific, and Regulatory Deficiencies in Cannabis Testing Requirements

November 13, 2025

Overview

Nevada Senate Bill 157 and the proposed Cannabis Compliance Board regulation R152-24 present critical deficiencies across constitutional, scientific, and regulatory domains. This analysis documents how Multi-State Operators orchestrated a coordinated campaign to capture Nevada's cannabis testing framework after the CCB rejected their September 2024 petition on scientific and safety grounds. The evidence reveals systematic manipulation across three fronts—the CCB, Nevada Legislature, and ASTM International—to increase testing lot sizes from 5 to 15 pounds while eliminating meaningful state oversight.

Critical Findings

Constitutional Violations

Unprecedented Delegation: R152-24 and SB 157 require that testing standards "must align with the most current version" of ASTM D8334/D8334M, creating automatic adoption of future private standards without state review. This violates Nevada's private nondelegation doctrine established in Carter v. Carter Coal Co., 298 U.S. 238 (1936).

Absence of State Oversight: Unlike traditional Nevada practice of adopting specific versions of external standards with amendment authority, SB 157 provides no mechanism for CCB to review, reject, or modify ASTM changes before automatic incorporation into Nevada law.

Moving Target Problem: ASTM Workshop WK94344 was initiated March 29, 2025—just 48 hours after SB 157 passed the Nevada Senate—to "remove the 15lb max batch size." This creates an unknowable standard that cannot be legally enforced or complied with.

Scientific Inadequacy

Statistical Invalidity: Currently proposed sampling protocols for 15-pound lots achieve only 0.29% effective sampling rates versus the required 0.88%, resulting in statistical power of 0.21 (versus required 0.80) and confidence of 51% (versus required 95%). This renders testing scientifically meaningless under ISO/IEC 17025:2017 standards.

Measurement Uncertainty Explosion: For 15-pound lots, measurement uncertainty reaches ±102% at the 68% confidence level, meaning cannabis tested at 20% THC could be reported anywhere from negative values to over 40% THC. This violates fundamental scientific principles and ISO accreditation requirements.

Critical Homogenization Failure: The currently proposed practice would collect 60 grams but divides into three 20-gram portions and homogenizes only one portion, dropping the effective sampling rate from 0.88% to 0.29%. Proper practice requires homogenizing the full 60-gram sample representing 0.88% of the lot before subdivision.

Public Health Consequences

Aspergillus Detection Failure: With currently proposed protocols, 91% of dangerous Aspergillus contamination in 15-pound lots goes undetected, versus 79% with proper sampling. This fungal pathogen causes invasive pulmonary aspergillosis in immunocompromised patients, including those undergoing chemotherapy or organ transplantation.

Potency Labeling Crisis: Under this proposed standard THC measurement uncertainty of ±17.4 percentage points for 15-pound lots means cannabis tested at 20% THC could be reported from 2.6% to 37.4% at the 95% confidence level, violating Nevada's labeling requirements and endangering consumers who rely on accurate potency information.

Evidence of Regulatory Capture

Failed CCB Petition: On September 19, 2024, the CCB rejected a Multi-State Operator petition to increase lot sizes to 50 pounds, citing insufficient scientific evidence and public health concerns. Rather than returning with better evidence as suggested, the MSO immediately pivoted to the legislature.

Coordinated Timeline: March 27, 2025: SB 157 passed the Nevada Senate with original language referencing "ASTM D8334-20" (2020 version). March 29, 2025: ASTM Workshop WK94344 initiated by an MSO employee who serves as ASTM D37.02 Subcommittee Chair to "remove the 15lb max batch size." April 24, 2025: Amendment 741 changes SB 157 language to "most current version," creating automatic adoption of unknown future ASTM standards. May 29, 2025: SB 157 passed the Assembly and was signed into law in June 2025 with its automatic adoption mechanism.

Conflicts of Interest: The MSO employee who serves as technical contact for ASTM Workshop WK94344 is simultaneously the MSO's Quality Director and the technical contact for the workshop to remove the 15 pound lot size limitation. ASTM D37 Vice-Chair Dave Vaillencourt who operates The GMP Collective is marketing "ASTM Standards Development" services for $3,000, creating financial incentives to develop industry-friendly standards.

Automatic Adoption Mechanism: R152-24 Section 61 introduces a 30-day automatic approval provision where "silence equals consent," fundamentally reversing normal regulatory review and effectively transferring Nevada's authority to a private organization controlled by industry employees and consultants.

Understanding the Statistical Requirements

The 0.88% Sampling Rate Requirement

Cannabis testing requires approximately 62 independent observations to achieve 95% confidence with a 5% margin of error. Because cannabis material is not perfectly homogeneous, a design effect of 2-3 accounts for non-independence, requiring a 0.88% sampling rate to maintain acceptable statistical precision.

This rate must scale proportionally with lot size to maintain constant precision:

5-pound lots: 20 grams per testing event (0.88% of 2,268g)

10-pound lots: 40 grams per testing event (0.88% of 4,536g)

15-pound lots: 60 grams per testing event (0.88% of 6,804g)

The CCB recognized this 0.88% requirement when they finalized the proposed change to NCCR Regulations 11.050 3 in the May 2024 version for submission to the LCB changing the required sample size to 20 grams for each 5 pound lot.

The Critical Homogenization Requirement

The most commonly misunderstood aspect of proper cannabis testing is the homogenization requirement. The entire sample representing 0.88% of the lot must be homogenized together before subdivision for testing, retesting, and retention.

Currently Proposed Flawed Practice: Collect 60 grams, divide into three 20-gram portions, homogenize only one 20-gram portion. Result: Effective sampling rate drops to 0.29% (20g ÷ 6,804g), producing statistically meaningless results.

Required Scientific Practice: Collect 180 grams total (3 × 60g), homogenize each entire 60-gram portion together before analysis. Result: Effective sampling rate maintains 0.88% (60g ÷ 6,804g), producing statistically valid results.

The Deck-Shuffling Analogy: You cannot divide a deck of cards into three piles, shuffle only one pile, and expect cards drawn from that pile to represent the entire deck. Cannabis testing requires the same principle: homogenize the entire 0.88% sample, then subdivide for testing.

Statutory Authority for Proper Sampling

"Not Less Than" Language: SB 157 uses the phrase "not less than" nine times, establishing minimums while explicitly preserving CCB authority to require larger scientifically justified samples. No maximum sample size is specified anywhere in SB 157 or ASTM D8334.

ASTM Jurisdictional Precedence: ASTM D8334 Section 1.2 explicitly states: "Where procedural aspects of this practice differ from local regulatory or jurisdictional requirements, the local regulatory or jurisdictional authority's directives shall take precedence." This confirms CCB's authority to exceed ASTM minimums.

NRS 233B.040 Authority: Nevada law grants agencies authority to adopt "reasonable regulations" that are "necessary to the proper execution" of assigned functions, explicitly allowing CCB to exceed statutory minimums when scientifically justified for public health protection.

Comprehensive Recommendations

Immediate Actions Required

1. Compel Testimony: The CCB should require the MSO employee who serves as ASTM D37.02 Subcommittee Chair to testify under oath regarding: (a) the timeline for initiating ASTM Workshop WK94344 on March 29, 2025, just 48 hours after SB 157 passed the Senate; (b) her multiple roles as MSO Quality Director and ASTM committee officer; and (c) coordination with MSO management, Senator Flores's office, or others involved in SB 157's passage.

2. Independent ASTM Verification: Call independent ASTM officials to testify regarding standard workshop procedures, conflict of interest policies for committee members employed by regulated entities, and whether Saturday workshop initiations are common practice.

3. Reject Automatic Adoption: Remove R152-24 Section 61's automatic approval provision. Adopt ASTM D8334-20 (2020 version) by reference as was proposed in the CCB's 'Proposed changes to NCCR Regulations 5,7, and 11" in the May 2024 version at 11.025_1_ (f) and require affirmative CCB approval through formal rulemaking before any subsequent ASTM revisions become effective under Nevada law.

4. **Maintain the CCB's conflict resolution provision** providing "guidance" found in the May 2024 proposed NCCR Regulations 5,7, and 11" in the May 2024 version at 11.025_1_ (g).

Regulatory Safeguards

Conflict of Interest Disclosure: Require mandatory disclosure of ASTM committee membership, employer relationships, and financial interests for anyone testifying on technical standards. Prohibit testimony from ASTM committee officers who market "ASTM Standards Development" consulting services.

Independent Scientific Review: Create an independent scientific advisory panel to review proposed ASTM changes, evaluate scientific evidence, conduct independent statistical analysis, and assess public health implications before CCB adoption.

Public Notice and Comment: Establish minimum 60-day notice periods for proposed ASTM adoptions, public hearings for testing laboratories and consumer advocates, written findings documenting scientific basis, and economic impact analysis.

Scientific Requirements for Valid Testing

Implement Proper Sampling: Require complete testing programs with proper homogenization: 5-pound lots need 60 grams total (3 × 20g); 10-pound lots need 120 grams total (3 × 40g); 15-pound lots need 180 grams total (3 × 60g).

Mandate Proper Homogenization: Explicitly require that the entire sample representing 0.88% of the lot be homogenized together before subdivision for testing, retesting, and retention. Currently proposed practice of subdividing first, then homogenizing only a portion, produces statistically meaningless results.

Establish Scaled Requirements: Adopt regulations specifying that sample sizes must scale proportionally with lot size to maintain constant 0.88% sampling rate and statistical validity across all lot sizes.

Monitor Public Health Outcomes: Track detection rates for microbial contamination, potency measurement accuracy, and consumer safety incidents to validate testing protocol effectiveness.

Conclusion

The evidence compiled in this analysis demonstrates that Nevada's cannabis testing framework suffers from fundamental constitutional, scientific, and procedural deficiencies. What Multi-State Operators could not achieve through proper regulatory channels—rejection by the CCB on September 19, 2024—they achieved through legislative engineering and ASTM standards capture.

The timing is irrefutable: an MSO employee serves as the Technical Contact for the ASTM Workshop WK94344 which was initiated to "remove the 15lb max batch size" on Saturday March 29, 2025, just 48 hours after SB 157 passed the Nevada Senate. Amendment 741 subsequently changed the statutory language from "ASTM D8334-20" to "most current version," creating automatic adoption of whatever this industry-controlled ASTM committee produces.

The scientific evidence is unambiguous: the currently proposed sampling protocols render testing statistically meaningless. For 15-pound lots, measurement uncertainty reaches ±102%, statistical power drops to 0.21 (versus required 0.80), and 91% of dangerous Aspergillus contamination goes undetected. These are not minor technical deficiencies—they represent complete testing failure.

The Cannabis Compliance Board faces a critical choice: implement scientifically defensible requirements that actually protect public health, or continue the illusion of safety that industry wrote for itself. Nevada has an opportunity to lead by implementing the nation's first truly scientific cannabis testing program. The alternative—continuing with statistically invalid testing that lets 91% of dangerous contamination pass undetected—is both scientifically indefensible and ethically unacceptable.

The MSOs successfully maneuvered the legislature into outsourcing Nevada law to their own employee. The question now is whether the CCB will fulfill its statutory duty to protect public health, or whether it will rubber-stamp whatever industry wants while pretending to provide consumer safety.

Comprehensive Analysis of Nevada Senate Bill 157 and LCB File No. R152-24

Constitutional, Scientific, and Regulatory Deficiencies
in Cannabis Testing Requirements

A Comprehensive Review Integrating:
Constitutional Law • Statistical Methodology • Regulatory Capture Evidence
Implementation Frameworks • Administrative Procedure Requirements

November 12, 2025

Table of Contents

Executive Summary

Nevada Senate Bill 157 (2025) and LCB File No. R152-24 present significant constitutional and technical challenges that warrant serious consideration prior to implementation. This comprehensive analysis documents critical deficiencies across multiple domains: constitutional law, statistical methodology, regulatory procedure, and public health protection. The evidence reveals a coordinated campaign to circumvent regulatory oversight through simultaneous manipulation of state legislation and private technical standards, creating unprecedented delegation of state regulatory authority to industry representatives.

Critical Findings

1. Constitutional Violation: SB 157's requirement that testing standards "must align with" ASTM D8334/D8334M without state review authority represents unprecedented delegation of legislative power to a private organization, likely violating Nevada's private nondelegation doctrine as established in Carter v. Carter Coal Co., 298 U.S. 238 (1936).
2. Scientific Inadequacy: Current sampling requirements are statistically meaningless. For 15-pound lots, effective sampling rates of only 0.29% (versus required 0.88%) result in 91% of dangerous Aspergillus contamination going undetected and measurement uncertainty exceeding 100%, rendering results scientifically invalid under ISO/IEC 17025:2017 standards.
3. Regulatory Capture: Documentary evidence suggests that Muti-state Operators (MSO) orchestrated a coordinated campaign across three institutional fronts—the Cannabis Compliance Board (CCB), Nevada Legislature, and ASTM International—to dramatically increase cannabis testing lot sizes from 5 pounds to 15 pounds after the CCB rejected their petition on September 19, 2024, citing insufficient scientific evidence.
4. Timeline Evidence of Coordination: an MSO employee, the MSO's Quality Director and ASTM D37.02 Subcommittee Chair, serves as the technical contact for ASTM Workshop WK94344 to "remove the 15lb max batch size" which was initiated on Saturday, March 29, 2025—just 48 hours after SB 157 passed the Nevada Senate. This timing, combined with Amendment 741's subsequent change to "most current version" language, reveals deliberate orchestration to automatically incorporate new, unknown ASTM standard changes into Nevada law.
5. Conflicts of Interest: ASTM D37 Vice-Chair Dave Vaillencourt operates The GMP Collective, a consulting firm explicitly marketing "ASTM Standards Development and Benchmarking" services to cannabis operators for $3,000, creating financial incentives to develop industry-friendly standards that reduce compliance costs.
6. Automatic Adoption Mechanism: CCB draft regulation R152-24 Section 61 introduces a 30-day automatic approval provision where "silence equals consent," fundamentally reversing

normal regulatory review processes and effectively transferring Nevada's regulatory authority to a private standards organization controlled by industry employees and consultants. This remedy is insufficient and fails to achieve its intended goal.

7. Statutory Interpretation Authority: Both SB 157 and ASTM D8334 explicitly establish minimums using "not less than" language nine times, providing clear legal authority for CCB to require larger scientifically justified samples. ASTM D8334 Section 1.2 explicitly states: "local regulatory or jurisdictional authority's directives shall take precedence."
8. R152-24 Procedural Irregularities: The November 20, 2025 regulatory hearing reveals that R152-24 was substantially rewritten after SB 157's passage (comparing June 2024 version vs. August 2025 version), appearing to bypass normal administrative procedures while implementing automatic adoption mechanisms for private standards developed by organizations with regulatory capture concerns.

Public Health Consequences

The scientific deficiencies create immediate threats to consumer safety:

- Microbial Detection Failure: Only 12% probability of detecting 5% Aspergillus contamination in 15-pound lots using currently proposed practice (versus 31% with proper sampling), meaning 88% of dangerous fungal contamination affecting immunocompromised patients goes undetected.
- THC Measurement Crisis: Measurement uncertainty of ±17.4% for 15-pound lots means cannabis tested at 20% THC could be reported anywhere from 16.5% to 23.5%, violating labeling requirements and endangering consumers who rely on accurate potency information while defrauding those who ‘overpay’ for THC.
- Statistical Invalidity: Statistical power of 0.21 (versus required 0.80) and statistical confidence of 51% (versus required 95%) render current testing scientifically meaningless, jeopardizing laboratories’ ISO/IEC 17025 accreditation.

The Critical Homogenization Misunderstanding

The most commonly misunderstood aspect of proper cannabis testing is the homogenization requirement. Currently proposed industry practice collects adequate material but fails to homogenize the entire sample together before subdivision, destroying statistical validity.

Flawed currently proposed practice: Collect 60 grams from 15-pound lot, divide into three 20-gram portions, homogenize only one 20-gram portion for testing. Result: Effective sampling rate drops to 0.29% (20g ÷ 6,804g), producing statistically meaningless results.

Required scientific practice: Collect 180 grams total (3 × 60g), homogenize entire 60-gram testing portion together before analysis, maintain separate 60-gram portions for retesting and retention. Result: Effective sampling rate maintains 0.88% (60g ÷ 6,804g), producing statistically valid results.

The deck-shuffling analogy: You cannot divide a deck of cards into three piles, shuffle only one pile, and expect cards drawn from that pile to represent the entire deck. Cannabis testing

requires the same principle: homogenize the entire sample representing 0.88% of the lot, then subdivide for testing. Current practice of subdividing first, then homogenizing only a portion, produces statistically meaningless results.

Regulatory Timeline and Implementation Authority

Nevada Revised Statutes (NRS) 233B.040 governs how agencies adopt regulations and provides critical timeline and authority context:

- Two-Year Adoption Requirement: CCB must adopt proposed regulations within two years after submission to Legislative Counsel pursuant to NRS 233B.040(4). Failure requires Executive Director personal appearance before Legislative Commission to explain delay.
- Timeline Flexibility: The two-year clock starts when CCB submits proposed regulations to Legislative Counsel, not when SB 157 becomes effective (October 1, 2025). This provides CCB flexibility in timing initial submission while ensuring eventual implementation.
- Adoption by Reference Requirements: When adopting ASTM standards by reference, CCB must file copies with Secretary of State and State Library, disclose source and purchase price, and make copies available for public inspection per NRS 233B.040(3).
- Reasonable and Necessary Standard: NRS 233B.040(1) grants agencies authority to adopt "reasonable regulations" that are "necessary to the proper execution" of assigned functions, explicitly allowing CCB to exceed statutory minimums when scientifically justified.

Document Scope and Organization

This comprehensive analysis addresses SB 157's deficiencies through seven integrated parts:

Part I: Constitutional and legal framework, including private nondelegation doctrine analysis, NRS 233B.040 requirements, and adoption by reference standards.
Part II: Scientific and statistical requirements, demonstrating why sample sizes must exceed statutory minimums through detailed mathematical derivations and validation.
Part III: Statutory authority for scaled sampling requirements, including "not less than" language interpretation and ASTM D8334 Section 1.2 jurisdictional precedence provision.
Part IV: ASTM D8334 sampling protocol options and NCCR Regulation 11 implementation frameworks for practical regulatory adoption.
Part V: Documentary evidence of regulatory capture, including complete timeline analysis proving coordinated manipulation across CCB, legislature, and ASTM International.
Part VI: Comprehensive recommendations for CCB action to restore regulatory independence and implement scientifically valid testing protocols.
Part VII: Legal safeguards to prevent future regulatory capture and protect consumer safety, including conflict of interest disclosure requirements and independent scientific review processes.

Critical Conclusion

The evidence compiled in this analysis proves that Nevada's cannabis testing framework suffers from fundamental constitutional, scientific, and procedural deficiencies. What the MSO could not achieve through proper regulatory channels, they achieved through legislative engineering and

ASTM standards capture. The MSOs successfully maneuvered the legislature into outsourcing Nevada law to their own employee.

The Cannabis Compliance Board faces a critical choice: implement scientifically defensible requirements that actually protect public health, or continue the illusion of safety that industry wrote for itself. The statistical evidence is unambiguous—current requirements render testing meaningless. Nevada has an opportunity to lead by implementing the nation's first truly scientific cannabis testing program. The irresponsible alternative—continuing with statistically invalid testing—is both scientifically indefensible and ethically unacceptable.

Part I: Constitutional and Legal Framework

The Private Nondelegation Doctrine Violation

SB 157's delegation of regulatory authority to ASTM International represents an unprecedented constitutional violation. Nevada's private nondelegation doctrine prohibits the legislature from delegating lawmaking authority to private entities without maintaining sufficient state oversight and control.

SB 157's Mandatory Alignment Requirement

"The collection of representative samples of a lot to be conducted in accordance with standards established by the Board, which must align with the most recent version of the ASTM International Standard ASTM D8334/D8334M." — NRS 678B.XXX (SB 157, Section 3, subsection 2(b))

The phrase "must align with" creates mandatory compliance with ASTM standards, removing CCB discretion to deviate from ASTM requirements even when scientific evidence or public health concerns justify different approaches. This contrasts sharply with Nevada's traditional approach of "may adopt by reference" language that preserves regulatory agency authority.

The "Most Current Version" Automatic Adoption

Amendment 741's change from "ASTM D8334-20" (specific 2020 version) to "most current version" creates automatic adoption of future ASTM revisions without state review. **This mechanism represents regulatory delegation to a private organization whose decisions automatically become Nevada law.**

Critical distinction: Nevada has historically adopted specific versions of external standards (e.g., "ASTM D8334-20"), allowing the state to review proposed updates before adoption. **SB 157's "most current version" language eliminates this review opportunity, creating automatic incorporation of whatever ASTM publishes.**

ASTM as a Private Organization

ASTM International is a private Pennsylvania corporation (ASTM International, Inc., Pennsylvania Corporation Number 0165110, incorporated 1898) that generates revenue

through standards sales, membership fees, and training programs. **ASTM is not a governmental entity, quasi-governmental agency, or public benefit organization.**

ASTM committee membership is voluntary and includes direct representation from regulated industries. **Committee D37 on Cannabis includes employees of cannabis cultivation and processing companies who have direct financial interests in the standards they develop. This creates inherent conflicts between commercial financial interests and regulatory protection of public health.**

Absence of State Oversight Mechanisms

Unlike Nevada's adoption of building codes (which incorporate International Building Code by reference but maintain state amendment authority) or environmental standards (which reference EPA methods but allow state-specific modifications), SB 157 provides no mechanism for CCB to:

- Review proposed ASTM standard changes before automatic adoption
- Reject ASTM revisions that conflict with Nevada's public health priorities
- Modify ASTM requirements to address Nevada-specific concerns
- Require public notice and comment periods for ASTM changes
- Conduct independent scientific review of ASTM technical decisions

Absence of "Must Align" Language in Nevada Law

Extensive review of Nevada statutes reveals no existing precedent for the "must align with" language contained in SB 157. Nevada has consistently employed two approaches when incorporating private standards:

Dynamic Incorporation with Oversight: Nevada Administrative Code provisions such as NAC 512.562 and NAC 477.283 adopt standards "by reference" but explicitly preserve administrative authority to disapprove updates within specified timeframes (typically 60-180 days).

Static Incorporation: Statutes reference specific editions of standards, such as NRS 477.150's reference to "ANSI A 17.1 of the 1978 edition."

The proposed mandatory statutory alignment without review authority would likely violate established principles of the private nondelegation doctrine articulated in Carter v. Carter Coal Co., 298 U.S. 238 (1936). **This doctrine prohibits legislative bodies from delegating governmental authority to private entities without maintaining adequate oversight and accountability mechanisms**.

The Moving Target Problem: ASTM D8334 Under Active Revision

The requirement in SB 157 to "align with the most recent version" of ASTM D8334/D8334M presents an immediate and fundamental problem: **the standard is currently undergoing active revision through ASTM Work Item WK94344, initiated March 29, 2025**. **The stated rationale for this revision explicitly includes "remove the 15lb max batch size"** - directly

contradicting SB 157's carefully defined lot size limits of 15 pounds for flower, 45 pounds for trim, and 150 pounds for wet material.

This revision process demonstrates precisely why (statutory) mandatory alignment with private standards without state oversight authority is highly likely to violate constitutional principles.

Delegation to an Unstable Authority: The ASTM revision process operates on a 5-year cycle, with standards subject to change "at any time by the responsible technical committee." **This creates a situation where Nevada law would automatically incorporate whatever changes ASTM's private committee decides, including changes that directly contradict the explicit statutory language of SB 157 itself.**

Circumvention of Legislative Process: The ASTM committee's stated goal to "revamp standard to make more appropriate for industry" and "align with global standards" represents policy-making that properly belongs to Nevada's elected legislators. **Private industry participants on ASTM committees would effectively be rewriting Nevada law through technical committee votes, bypassing public hearings, economic impact assessments, and democratic accountability.**

Irreconcilable Conflicts: If ASTM removes the 15-pound maximum batch size while SB 157 explicitly defines lots as "15 pounds or less," which requirement controls? This creates an extremely challenging situation for laboratories and cultivators who must somehow comply with potentially mutually exclusive requirements. **The constitutional delegation doctrine exists precisely to prevent such scenarios where private entities can create legal requirements that conflict with statutory law.**

Version Control Chaos: Unlike Nevada's current practice of adopting specific editions of standards (e.g., "2018 edition" in NAC 477.281), the "most recent version" language means laboratories would need to continuously monitor ASTM for updates, potentially changing their procedures multiple times per year without any transition period or implementation timeline.

Economic Uncertainty: Laboratory investments in equipment, training, and standard operating procedures based on current ASTM D8334/D8334M-20 requirements could become worthless overnight if the ASTM standard changes. The state would have no authority to delay implementation, grant transition periods, or modify requirements to account for Nevada-specific conditions or economic impacts on laboratories.

Regulatory Capture Risk: **ASTM Committee D37.03 on Cannabis Laboratory consists primarily of industry stakeholders who may have financial interests in specific testing methodologies or equipment.** Mandatory alignment without state review essentially delegates Nevada's public health regulations to a committee that may prioritize industry convenience in financial interests over public safety or laboratory viability.

NRS 233B.040: Nevada Administrative Procedure Act Requirements

NRS 233B.040 governs how Nevada agencies adopt regulations and incorporate external materials by reference. This statute provides the legal framework for CCB's implementation of

SB 157 and reveals critical tensions between legislative mandates and administrative procedures.

Statutory Authority and Limitations (NRS 233B.040(1))

"To the extent authorized by the statutes applicable to it, each agency may adopt reasonable regulations to aid it in carrying out the functions assigned to it by law and shall adopt such regulations as are necessary to the proper execution of those functions. If adopted and filed in accordance with the provisions of this chapter, the following regulations have the force of law and must be enforced by all peace officers: (a) The Nevada Administrative Code; and (b) Temporary and emergency regulations. In every instance, the power to adopt regulations to carry out a particular function is limited by the terms of the grant of authority pursuant to which the function was assigned."

This provision establishes two critical principles:

9. Reasonable and Necessary Standard: Regulations must be both "reasonable" (not arbitrary or irrational) and "necessary" (required for proper function execution). This standard allows CCB to require sample sizes exceeding SB 157 minimums when scientifically necessary.
10. Limited by Grant Authority: The CCB's regulatory power derives from and is limited by SB 157's terms. **However, SB 157's use of "not less than" language for sample sizes establishes floors rather than ceilings, preserving CCB authority to require larger samples when scientifically justified.**

Required Regulatory Elements (NRS 233B.040(2))

"Every regulation adopted by an agency must include: (a) A citation of the authority pursuant to which it, or any part of it, was adopted; and (b) The address of the agency and, to the extent not elsewhere provided in the regulation, a brief explanation of the procedures for obtaining clarification of the regulation or relief from the strict application of any of its terms, if the agency is authorized by a specific statute to grant such relief, or otherwise dealing with the agency in connection with the regulation."

These requirements ensure regulatory transparency and accessibility. **Any CCB regulation implementing SB 157 must explicitly cite the statutory authority (specific sections of SB 157 and ASTM D8334) and provide clear procedures for licensees to seek clarification or variance.**

Adoption by Reference Standards (NRS 233B.040(3))

"An agency may adopt by reference in a regulation material published by another authority in book or pamphlet form if: (a) It files one copy of the publication with the Secretary of State and one copy with the State Library, Archives and Public Records Administrator, and makes at least one copy available for public inspection with its regulations; and (b) The reference discloses the source and price for purchase of the publication. An agency shall not attempt to incorporate any other material in a regulation by reference."

Critical implications for ASTM D8334 adoption:

- Filing Requirements: CCB must file physical copies of ASTM D8334 with Nevada Secretary of State and State Library. Given ASTM's copyright restrictions and sales model (standards cost hundreds of dollars), this creates practical barriers to public access.
- Source and Price Disclosure: Regulations must disclose where to purchase ASTM D8334 and its cost (currently $79 for PDF version, $91 for print version from ASTM). This mandatory disclosure reveals a constitutional problem: this Nevada law effectively requires paying a private corporation to access legally binding requirements.
- Public Access: At least one copy must be available for public inspection at CCB offices. This requirement ensures Nevada residents can review the standards without purchasing them from ASTM, but does not permit copying or distribution due to copyright restrictions.

Two-Year Adoption Deadline (NRS 233B.040(4))

"**An agency shall adopt a proposed regulation not later than 2 years after the date on which the proposed regulation is submitted to the Legislative Counsel pursuant to subsection 1 of NRS 233B.063.** If an agency does not adopt a proposed regulation within the time prescribed by this subsection, the executive head of the agency shall appear personally before the Legislative Commission and explain why the proposed regulation has not been adopted."

Timeline implications for CCB implementation:

- Clock Starts with Legislative Counsel Submission: **The two-year deadline begins when CCB submits proposed regulations to Legislative Counsel Bureau (LCB), not when SB 157 becomes effective (October 1, 2025). This provides CCB flexibility in timing initial submission.**
- Accountability Mechanism: Failure to adopt within two years requires CCB Executive Director, James Humm, to personally explain delays to Legislative Commission. This creates strong institutional pressure for timely completion but should not compromise thorough scientific review.
- Strategic Timeline Options: CCB could submit preliminary regulations to LCB in mid-2026, starting the two-year clock while continuing stakeholder engagement and scientific review. This balances urgency with thoroughness.

Constitutional Tension: Mandatory Alignment vs. Regulatory Authority

SB 157's "must align with" language creates additional constitutional tension with CCB's regulatory authority under NRS 233B.040(1), which grants agencies power to adopt "reasonable regulations" necessary for proper function execution. **When ASTM standards conflict with scientific evidence or public health needs, the CCB faces an impossible choice**:

- **Follow ASTM requirements that may be scientifically inadequate or unsafe, violating CCB's duty to protect public health under NRS 678A.350.**
- **Deviate from ASTM potentially scientifically inadequate standards to implement scientifically valid requirements, potentially violating SB 157's mandatory alignment directive.**

This constitutional tension is precisely why Nevada historically avoided "must align" language in favor of "may adopt by reference" formulations that preserve regulatory agency discretion.

Application to R152-24's Automatic Adoption Mechanism

R152-24 Section 61(4)'s provision that standards are "deemed to be approved" if the CCB does not disapprove within 30 days creates a fundamental conflict with NRS 233B.040(3). **The statute requires affirmative agency action—filing, disclosure, and public availability—for every adoption. Automatic adoption by silence cannot satisfy these mandatory procedural requirements.**

When ASTM publishes a revised standard (such as the anticipated D8334-25 removing the 15-pound lot size limit), the CCB cannot simply allow 30 days to pass and consider the new version automatically adopted. Instead, the agency must:

- Obtain physical copies of the new standard version
- File these copies with the Secretary of State and State Library
- Update the regulation to disclose the new version's source and price
- Make the new version available for public inspection
- Conduct this process through formal rulemaking under NRS Chapter 233B, including public notice and comment

Constitutional Implications

The requirement to disclose purchase price and source creates a due process problem: Nevada law would effectively require citizens and regulated entities to pay a private corporation (ASTM International) to access legally binding requirements. While NRS 233B.040(3) attempts to mitigate this through the public inspection requirement, this solution is inadequate because requires Nevada residents to physically travel to CCB offices to review standards they are legally obligated to follow.

Federal courts have held that when private standards are incorporated into law, they enter the public domain and cannot be restricted by copyright. **The Fifth Circuit in Veeck v. Southern Building Code Congress Int'l, 293 F.3d 791 (5th Cir. 2002) (en banc), reasoned that "due process requires that citizens have access to the laws which govern them." Nevada's practice of requiring payment to a private entity for access to binding legal requirements likely violates this principle.**

Contrast with Nevada's Historical Practice

Nevada has traditionally adopted specific versions of external standards (e.g., "ASTM D8334-20" designating the 2020 edition) rather than open-ended references to "the most current version." This practice serves several purposes:

- Legislative Control: The legislature and agencies know exactly what requirements they are adopting
- Public Notice: Regulated entities can identify and obtain the specific standard version that applies to them
- Regulatory Stability: Requirements do not change automatically without agency review and action
- Compliance with NRS 233B.040(3): The agency can fulfill filing and disclosure requirements for a specific, identified publication

SB 157's departure from this practice—requiring alignment with "the most recent version" combined with R152-24's automatic adoption mechanism—represents an unprecedented delegation that cannot be reconciled with NRS 233B.040(3)'s procedural safeguards

Part II: Scientific and Statistical Requirements for Cannabis Testing

Understanding the Statistical Foundations: A Simplified Explanation

Before examining the technical deficiencies in SB 157, it is essential to understand the statistical principles that underpin valid cannabis testing. This section provides a simplified explanation of the statistical concepts that justify the 0.88% minimum sampling rate and demonstrates why current inadequate sampling poses significant risks to public health and regulatory integrity.

Basic Statistical Principles in Cannabis Testing

When testing any product for safety and quality, we face a fundamental question: "How much of the product do we need to test to be confident our results represent the entire batch?" This is not a matter of opinion or convenience—it is governed by well-established mathematical principles that have been used in quality control for over a century.

The relationship between sample size and confidence follows predictable mathematical rules. Think of it like polling: if you want to predict an election outcome, polling 10 people gives you much less reliable information than polling 1,000 people. The same principle applies to cannabis testing—larger samples provide more reliable information about the entire lot.

The 0.88% Sampling Rate and How n Scales with Lot Size

Step 1: The Fundamental Statistical Requirement

The precision of any analytical measurement depends on obtaining a sufficient number of independent observations. The standard statistical formula for sample size is:

$n = (Z \times CV/E)^2$

Where:

- Z = 1.96 (95% confidence level - we can be 95% certain our results are accurate)

- CV = 0.20 (coefficient of variation representing moderate heterogeneity in cannabis - 20% expected variation)
- E = 0.05 (margin of error - we accept ±5% deviation in our measurements)

Calculation: $n = (1.96 \times 0.20/0.05)^2$
$n = (1.96 \times 4)^2$
$n = 7.84^2$
$n = 61.47 \approx 62$ independent observations

Critical Understanding: This formula tells us we need approximately 62 truly independent sampling units to achieve the desired statistical precision, regardless of lot size. This number (n) is constant for the chosen confidence level, heterogeneity, and margin of error.

Step 2: Defining the Sampling Unit
To apply this theoretical requirement to physical cannabis lots, we must define what constitutes one "sampling unit":

Sampling Unit (SU) = 1 gram of properly homogenized cannabis

This 1-gram definition is based on:

- Typical analytical subsample sizes used in chromatographic testing
- Practical limitations of laboratory homogenization equipment
- Minimum mass needed for reliable chemical analysis

Step 3: The Critical Bridge - Connecting n to Lot Mass
Here's where theory meets practice. For each analytical event (testing, retesting, or retention), we need to collect enough material to provide those ~62 independent observations:

For a lot of mass M_{lot} (in grams):

$n_{event} = [0.0088 \times M_{lot} / 1g]$

The 0.88% (0.0088 as a decimal) is chosen specifically so that, when accounting for realistic heterogeneity and partial independence of increments, we achieve the required statistical precision.

Why 0.88% Specifically?
The 0.88% rate emerges from the requirement that:

11. We need approximately 62 independent 1-gram sampling units (from the statistical formula)
12. For a reference lot size (such as 5 pounds = 2,268 grams), we calculate: 62 g ÷ 2,268 g ≈ 2.73%
13. However, because increments in a composite sample aren't fully independent due to spatial correlation, we adjust using a design effect factor (D_{eff})

Step 4: Accounting for Non-Independence (Design Effect)
In real-world sampling, increments collected from different parts of a lot are not perfectly independent. They exhibit spatial correlation and clustering. We account for this through the Design Effect (D_eff):

$n_{eff} = n_{event} / D_{eff}$

Where:

- n_{eff} = effective number of truly independent observations
- n_{event} = actual number of 1-gram units in the sample
- $D_{eff} \geq 1$ = design effect factor (typically 2-3 for heterogeneous botanical materials)

The actual margin of error achieved is:

$E \approx (Z \times CV) / \sqrt{n_{eff}}$

Solving for the Required Sampling Rate
We chose 0.88% so that for typical CV = 0.20 and a reasonable $D_{eff} \approx 3$:

For a 5-lb lot (2,268g):

- Sample needed: 0.0088 × 2,268g = 20g
- $n_{event} = 20$
- $n_{eff} = 20 / 3 \approx 6.7$ effective independent units
- $E \approx (1.96 \times 0.20) / \sqrt{6.7} \approx 0.15$ or 15% margin of error

This provides acceptable (though not ideal) precision for routine screening.

For optimal precision approaching the theoretical E = 5%, laboratories should use the 2.65% sampling rate (3× for testing, retesting, retention).

Step 5: How Sample Size Scales with Lot Size
This is the crucial insight: Because we maintain a constant percentage (0.88%) while the absolute mass increases, the number of sampling units (n) automatically scales with lot size:

Sample Size Scaling with Lot Size

Lot Size	Lot Mass (M_{lot})	Sample per Event (0.88%)	n_{event}
5 pounds	2,268 g	0.0088 × 2,268 = 20 g	20
10 pounds	4,536 g	0.0088 × 4,536 = 40 g	40
15 pounds	6,804 g	0.0088 × 6,804 = 60 g	60

Why n Must Scale with Lot Size

The marble bag analogy:

Imagine testing marbles for color distribution:

- Small bag (5 lbs): Contains 2,268 marbles. To get 20 independent samples, you pick 20 marbles spread throughout the bag.
- Large bag (15 lbs): Contains 6,804 marbles. If you only pick 20 marbles from this much larger bag, you're sampling a much smaller fraction of the total population, which increases uncertainty.

To maintain the same level of confidence in your estimate of the color distribution, you must sample the same proportion of each bag, not the same absolute number.

The Mathematical Proof

For a given lot, the sampling variance is:

$\text{Var}(\text{estimate}) \propto \sigma^2 / (n \times \text{sampling\_fraction})$

Where:

- σ^2 = variance in the lot (related to CV)
- n = number of sampling units
- sampling_fraction = proportion of lot sampled

To maintain constant variance (constant precision) as lot size increases:

- If lot size doubles, we must double n to keep the sampling fraction constant
- This is why 5 lbs requires 20g, 10 lbs requires 40g, and 15 lbs requires 60g

Step 6: The Critical Homogenization Requirement

Here lies the most important principle that current practice misunderstands:

The entire sample representing 0.88% of the lot must be homogenized together to maintain statistical validity. You cannot achieve the required n event by homogenizing smaller portions separately.

Why Homogenization of the Full Sample Matters

Incorrect approach:

- Collect 60g from a 15-lb lot ✓
- Divide into three 20g portions
- Homogenize only one 20g portion for testing ✗

Problem: Your effective sampling rate becomes 20g ÷ 6,804g = 0.29%, not 0.88%. Your n_event drops from 60 to 20, and with D_eff ≈ 3, your n_eff ≈ 7, giving you much worse precision.

Correct approach:

- Collect 180g total from a 15-lb lot (for testing + retesting + retention)
- For first test: homogenize full 60g together ✓
- After homogenization, divide into analytical portions
- Effective sampling rate: 60g ÷ 6,804g = 0.88% maintained

The marble analogy: If you need to know the average composition of mixed colored marbles, you must: (1) Take enough marbles to represent 0.88% of the total bag, (2) Mix all those marbles together thoroughly (homogenize), (3) Then divide the homogenized mixture for testing. Taking small portions from different parts of the bag and testing them separately defeats the purpose of representative sampling because you never create a truly representative composite.

Summary: The Complete Picture

The complete statistical framework:

- Statistical requirement: We need n ≈ 62 independent observations for 95% confidence with 5% margin of error (constant across all lot sizes)
- Sampling unit definition: 1 gram of homogenized cannabis = 1 sampling unit
- Design effect adjustment: Real samples aren't perfectly independent, so D_eff ≈ 2-3 reduces effective n
- The 0.88% rule: Chosen to provide acceptable precision accounting for design effect
- Scaling with lot size: To maintain constant precision (constant sampling fraction), absolute sample mass must scale proportionally with lot size: 5 lb → 20g per event; 10 lb → 40g per event; 15 lb → 60g per event
- Homogenization requirement: The entire sample representing 0.88% must be homogenized together before division into analytical portions
- Complete testing program: Three events (test, retest, retain) require: 5 lb → 60g total (3 × 20g); 10 lb → 120g total (3 × 40g); 15 lb → 180g total (3 × 60g)

The bottom line: The 0.88% sampling rate isn't arbitrary, it's the minimum percentage needed to obtain sufficient sampling units (n) to achieve acceptable statistical precision, and it must scale with lot size to maintain that precision. The absolute mass in grams changes, but the percentage stays constant, which is exactly what statistical theory requires. **The CCB clearly understands this and acknowledged it when it proposed the sample size change from 10g to 20g per 5-pound lot in the 'Proposed Changes to NCCR Regulations 5,7, and 11 in the Amended Notice of Intent to Act upon Regulations June 20, 2024'.**

Comparative Statistical Analysis: SB 157 Minimums vs. Scientific Requirements

The following comparative analysis demonstrates why SB 157's statutory minimums produce statistically invalid results for larger lots, **requiring CCB to implement scientifically justified scaled requirements.**

15-Pound Lot (6,804 grams) Statistical Comparison

Parameter	Current Flawed Practice	Required Scientific Practice
Collected sample	60 grams	180 grams (3 × 60g)
Homogenized for testing	20 grams	60 grams
Effective sampling rate	0.29%	0.88%
Effective n (homogenization quality)	n≈2.5	n≈7.5
Statistical confidence	51%	95%
Margin of error	±17.4%	±5%
Detection probability (5% contamination)	12%	31%
Detection probability (10% contamination)	22%	61%
Statistical power	0.21 (inadequate)	0.80 (adequate)
Conclusion	STATISTICALLY MEANINGLESS	STATISTICALLY VALID

Power and confidence calculations assume two-sample proportion test with α=0.05, effect size based on 20% absolute difference in detection rates, Explanation of calculations: n_eff row showing homogenization quality assumptions

Detection Probability: Understanding When Testing Fails

One of the most critical aspects of cannabis testing is detecting contamination that might harm consumers. The ability to detect contamination depends heavily on sample size and follows what statisticians call the binomial distribution.

The probability of detecting contamination can be calculated using:

$$P(\text{detection}) = 1 - (1 - p)^n$$

Where:

- p = the proportion of the lot that is contaminated
- n = the effective number of independent samples tested

Critical note: The effective number of independent samples (n) depends critically on homogenization quality. For properly homogenized material, n approximates the sample weight in grams (assuming 1g analytical portions). However, inadequate mixing reduces n to the number of distinct "clumps" in the sample—typically only 2-4 for a 20g poorly mixed sample versus 15-20 for properly homogenized material. This reduction in effective n dramatically decreases detection probability.

For example, if 5% of a cannabis lot contains dangerous mold:

- With a 20-gram inadequately homogenized sample (n_effective ≈ 2.5): only 12% chance of detection

- With a 60-gram properly homogenized sample (n_effective ≈ 7.5): 36% chance of detection
- With optimal homogenization achieving full independence (n = 60): 95% chance of detection

This means that under current inadequate sampling and mixing practices, contamination affecting 5% of a lot would go undetected 88% of the time—an unacceptable risk to public health.

Public Health Consequences of Inadequate Sampling

The statistical inadequacies documented above create direct threats to consumer safety, particularly for medically compromised patients using cannabis to treat serious conditions. The MSO(s)'s representative, Mr. Will Alder, on behalf of his MSO'(s) client, expressed a desire to study and possibly remove Aspergillus testing in his August 7, 2024 letter to the CCB and testimony at the September 2024 CCB meeting. This disregard demonstrates either a lack of understanding or lack of concern about this important consumer safety issue.

Aspergillus Contamination: The Silent Threat

Aspergillus species are opportunistic fungal pathogens particularly dangerous to immunocompromised individuals. Cannabis contaminated with Aspergillus has caused documented cases of invasive pulmonary aspergillosis in medical cannabis patients and other immunocompromised individuals including those undergoing chemotherapy or organ transplantation.

Aspergillus Detection Probability (localized contamination affecting 3% of lot)

Lot Size	Current Practice (20g homogenized)	Proper Practice (60g homogenized)	Detection Failure Rate
5 pounds	9%	21%	91% failures
10 pounds	9%	21%	91% failures
15 pounds	9%	21%	91% failures

Calculations: Using P(detection) = 1 - (1-0.03)^n for 3% contamination. Current (n=3): 1-(0.97)^3 = 8.7% ≈ 9%. Proper (n=7.5): 1-(0.97)^7.5 = 20.6% ≈ 21%.

Explanation of calculations:

- n_{eff} columns show the effective number of independent samples
- Used n values: n=3 for poorly mixed 20g samples, n=7.5 for properly mixed 60g samples
- Failure rate equals 1-detection for the 'Current Practice' column (91% = 1-9%)

Power and confidence calculations assume two-sample proportion test with α=0.05, effect size based on 20% absolute difference in detection rates.

Critical significance: For 15-pound lots using current practice, 91% of dangerous Aspergillus contamination goes undetected.

Potency Measurement Uncertainty Explosion

THC Reporting Accuracy (Assuming True THC = 20%)

Note on confidence intervals:

All uncertainties are expressed as ± percentage points around a true value of 20% THC.

The k = 1 ranges represent an approximate 68% confidence interval (±1σ).

The k ≈ 2 ranges are approximate 95% confidence intervals (±2σ), obtained by doubling the k = 1 uncertainty.

Table: Overall THC Reporting Uncertainty by Lot Size

Lot size	Scenario	k = 1 (≈68% CI) uncertainty (± % points)	k = 1 (≈68% CI) reported range (% THC)	k ≈ 2 (≈95% CI) reported range (% THC)
5 pounds	Current practice (20 g homogenized from 5-lb lot)	± 6.2	13.8 – 26.2	7.6 – 32.4
5 pounds	Proper practice (60 g homogenized from 5-lb lot)	± 3.9	16.1 – 23.9	12.2 – 27.8
10 pounds	Current practice (20 g homogenized from 10-lb lot)	± 13.4	6.6 – 33.4	−6.8 – 46.8
10 pounds	Proper practice (60 g homogenized from 10-lb lot)	± 3.9	16.1 – 23.9	12.2 – 27.8
15 pounds	Current practice (20 g homogenized from 15-lb lot)	± 20.4	−0.4 – 40.4	−20.8 – 60.8
15 pounds	Proper practice (60 g homogenized from 15-lb lot; see Appendix A.2.3)**	± 3.9	16.1 – 23.9	12.2 – 27.8

How the ranges are computed (example)
For a 15-lb lot under current practice with ±20.4 percentage-point uncertainty at k = 1:
– k = 1 (≈68% CI): 20% ± 20.4 → −0.4% to 40.4% THC
– k ≈ 2 (≈95% CI): 20% ± (2 × 20.4) → −20.8% to 60.8% THC

Measurement Uncertainty: The Hidden Problem

Every measurement has uncertainty—no test is perfectly accurate. ISO/IEC 17025, the international standard for laboratory competence, requires laboratories to calculate and report measurement uncertainty. The total uncertainty combines multiple sources:

Total Uncertainty = $\sqrt{(\text{Sampling Uncertainty}^2 + \text{Analytical Uncertainty}^2 + \text{Other Uncertainties}^2)}$

With inadequate sampling, the sampling uncertainty becomes so large that it overwhelms all other sources of uncertainty. When total measurement uncertainty exceeds 50%, the results become scientifically meaningless. This is not a matter of opinion—it is a mathematical fact that follows from the fundamental principles of measurement science.

Current Practice (20g homogenized):

- 5-pound lot: $U_{total} = \sqrt{(25^2 + 15^2 + 10^2)} = 30.4\%$
- 10-pound lot: $U_{total} = \sqrt{(52^2 + 41^2 + 10^2)} = 67.1\%$
- 15-pound lot: $U_{total} = \sqrt{(78^2 + 65^2 + 10^2)} = 102.3\%$

Proper Practice (60g homogenized per test):

- 5-pound lot: $U_{total} = \sqrt{(15^2 + 8^2 + 10^2)} = 19.4\%$
- 10-pound lot: $U_{total} = \sqrt{(15^2 + 8^2 + 10^2)} = 19.4\%$
- 15-pound lot: $U_{total} = \sqrt{(15^2 + 8^2 + 10^2)} = 19.4\%$

Measurement uncertainty exceeding 50% renders results scientifically meaningless and certainly jeopardizes and may prevent ISO/IEC 17025:2017 accreditation.

Part III: Statutory Authority for Scaled Sampling Requirements

The Minimum vs. Maximum Distinction

Both SB 157 statutory language and ASTM D8334 standard explicitly establish minimums rather than maximums for sample sizes. **This fundamental distinction provides legal authority for CCB to require larger samples when scientifically necessary.**

SB 157 Statutory Language: "Not Less Than"

SB 157, Section 3, subsection 2(c) states:

"For each lot of cannabis flower, the total aggregate weight of all representative samples to be collected for testing from the lot to be: (1) For a lot weighing less than 5 pounds, not less than 10 grams; (2) For a lot weighing 5 pounds or more but less than 10 pounds, not less than 15 grams; and (3) For a lot weighing 10 pounds or more but not more than 15 pounds, not less than 20 grams."

Critical legal interpretation: The phrase "not less than" establishes a floor, not a ceiling. This language creates mandatory minimums while explicitly preserving CCB authority to require larger samples. No maximum sample size is specified anywhere in SB 157.

ASTM D8334 "Minimum" Language

ASTM D8334/D8334M-20 uses the term "minimum" or "minimums" nine (9) times throughout the standard, reinforcing that specified sample masses represent baseline requirements subject to jurisdictional override:

ASTM D8334 Section 1.2:

"Where procedural aspects of this practice differ from local regulatory or jurisdictional requirements, the local regulatory or jurisdictional authority's directives shall take precedence."

ASTM D8334 Section 7.8.1:

"It is recommended that the minimum weight for a lab panel be 20 g [0.044 lb]."

ASTM D8334 Section 7.8.2:

"The **composite sample shall be 60 g** [0.132 lb] and distributed as follows: 7.8.2.1 20 g [0.044 lb] for full panel analytical testing; 7.8.2.2 20 g [0.044 lb] for retesting; and 7.8.2.3 20 g [0.044 lb] for sample retain."

Critical observation: Even ASTM's 60g total composite requirement (Section 7.8.2) derives from the "minimum weight for a lab panel" (Section 7.8.1) multiplied by three panels (testing, retesting, retain). The standard establishes baseline minimums, not maximum limits.

ASTM's Only Maximum: Harvest Batch Size

ASTM D8334-20 references a maximum only for harvest batch size (15 pounds), not for sampling event mass or laboratory panel mass. MSO’s employee, serves at the Technical Contact for the ASTM Workshop WK94344, initiated March 29, 2025, which explicitly aims to "remove the 15lb max batch size"—the sole maximum in the standard. No other maximum constraints exist.

Scientific Justification for Larger Samples (180g for 15-lb lots)

The scientific basis for requiring 180 grams total for a complete testing program on 15-pound lots derives from the 0.88% sampling rate requirement applied to each of three analytical events (testing, retesting, retention):

Scaled Requirements:

- 5-pound lots: 60 grams collected and homogenized (3 × 20g)
- 10-pound lots: 120 grams collected and homogenized (3 × 40g)
- 15-pound lots: 180 grams collected and homogenized (3 × 60g)

Statistical Foundation:

For a 15-pound lot (6,804 grams):

- Collected sample: 180 grams (3 × 60g for testing, retesting, retention)
- Homogenized for each test: 60 grams
- Effective sampling rate: 60g ÷ 6,804g = 0.88%
- Statistical confidence: 95% (±5% margin of error)
- Probability of detecting 5% contamination: 31%
- Probability of detecting 10% contamination: 61%
- Statistical power: 0.80 (adequate)

CONCLUSION: STATISTICALLY VALID

Part IV: ASTM D8334 Sampling Protocol Options and Implementation Frameworks

Overview of ASTM D8334 Sampling Framework

The ASTM standard provides flexible sampling protocols based on container type and batch configuration. Nevada can choose to implement these as mandatory or recommended practices.

Sampling Scheme A - Flat Container Protocol

When to Use: Containers ≤6 inches deep (trays, racks, individual plants)

Requirements:

- Randomly select containers using formula: $T = \sqrt{n} + 1$ (where n = number of containers)
- Minimum 5 containers for batches ≤16 containers
- See ASTM Table 1 for specific container counts
- Collect specimens from upper, middle, or lower sections
- Minimum 10 specimens total
- Continue until minimum weight achieved

Sampling Scheme B - Deep Container Protocol

When to Use: Containers >6 inches deep (bags, jars, supersacks, totes)

Requirements:

- Use ASTM Table 2 for container selection
- Sample from multiple depth levels (upper, middle, lower)
- Core sampling tools required for containers >10 cm depth
- Stratified sampling approach
- Larger sample sizes for larger containers

Sample Presentation Requirements

Homogenization Requirements (ASTM Section 6.1.1)
Cultivator Must:

- Mix material thoroughly within each container
- Ensure consistent moisture content throughout
- Remove foreign matter and contamination
- Document homogenization procedures

Nevada Options:

- Require pre-sampling homogenization certification
- Allow laboratory-performed homogenization
- Mandate specific mixing protocols

Environmental Controls (ASTM Section 6.1.3)
Storage During Sampling:

- Temperature: must document
- Humidity: must document
- Secure, controlled access area
- Contamination-free environment

Recommended Nevada's CCB NCCR 11 Implementation Structure

Section 11.050 - Sampling Protocol Selection
11.050.1 Approved Sampling Protocols

Cannabis testing facilities shall use one of the following protocols:

a. Standard ASTM Protocol

- Full compliance with ASTM D8334/D8334M-20
- Sampling Scheme A or B as appropriate
- 60g composite requirement

b. Nevada Modified Protocol

- ASTM sampling schemes with SB 157 minimums
- Reduced composite for small batches
- Board-approved modifications

c. Alternative Protocol

- Scientifically justified alternative
- Prior Board approval required

- Statistical equivalence demonstrated

Flexibility Provisions

Recommended Regulatory Language:

"The Board may approve alternative sampling protocols that: (1) Demonstrate statistical equivalence to ASTM D8334/D8334M-20; (2) Meet or exceed SB 157 minimum requirements; (3) Provide documented quality assurance; (4) Include proficiency testing validation"

Recommended Transition Accommodations:

"Facilities may request temporary variance for: Equipment procurement (up to 6 months); Training completion (up to 3 months); Existing inventory (grandfathered); Economic hardship (case-by-case)"

Key Decision Points for Nevada

- Mandatory vs. Recommended: Which ASTM requirements should be mandatory versus guidelines?
- Small Producer Accommodations: Should smaller lots have reduced requirements?
- Alternative Protocols: How much flexibility to allow for validated alternatives?
- Enforcement Timeline: Immediate compliance or phased implementation?
- Economic Impact Mitigation: Cost-sharing, subsidies, or extended timelines for small operators?

Part V: Documentary Evidence of Regulatory Capture

Current Regulatory Proceedings: The November 2025 Hearing and Procedural Violations

The Cannabis Compliance Board's Notice of Intent to Act Upon Regulations, dated for a hearing on November 20, 2025, proposes to adopt amendments to Nevada Cannabis Compliance Regulations 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 15, ostensibly to incorporate changes from the 2023 legislative session and cannabis-related workshops held throughout 2024 and finalized in June 2024 establishing new requirements for laboratory testing. Notwithstanding the stated purposes set forth in the Notice, a substantive review of the regulatory framework reveals that the Legislative Counsel Bureau's August 2025 version of R152-24 contains material modifications and substantive alterations from the regulations compiled in June 2024. These changes could be construed as incorporating the new requirements imposed by Senate Bill 157 (2025). These modifications appear to require the express statutory mandates contained in SB 157, particularly those provisions requiring representative sampling and testing protocols to align with ASTM D8334/8334M standards as enacted by the Legislature.

Furthermore, the procedural posture of these regulatory amendments raises substantial concerns regarding administrative law compliance and the proper delegation of legislative

authority. By incorporating substantive changes to testing protocols and lot definitions through the regulatory adoption process rather than through normal administrative procedures, the Board may be exceeding its rulemaking authority and effectively bypassing the statutory implementation process. This approach constitutes, in substance if not in form, an unauthorized avoidance of normal administrative policy determinations regarding adoption of a new statute. This could be construed as an attempt to implement industry standards developed by private organizations such as ASTM International, where potential conflicts of interest and regulatory capture concerns seem evident.

Overview: A Textbook Example of Regulatory Capture

This section documents a textbook example of regulatory capture in Nevada's cannabis testing reform, supported by extensive documentary evidence showing how Multi-State Operator (MSO) and its Quality Director MSO Employee orchestrated a coordinated campaign across three institutional fronts—the Cannabis Compliance Board (CCB), the Nevada Legislature, and ASTM International—to dramatically increase cannabis testing lot sizes from 5 pounds to (the current ASTM D8334/8334-20) 15 pounds.

The timing of these coordinated actions—particularly the initiation of the ASTM Workshop WK94344 on Saturday, March 29, 2025, just 48 hours after SB 157 passed the Nevada Senate—points to likely orchestration rather than organic policy evolution.

The Failed CCB Petition (September 19, 2024)

Background: The 2022 Sierra Cannabis Coalition Petition

The issue of lot size reform has a documented history in Nevada. On October 28, 2022, the Sierra Cannabis Coalition, represented by Mr. Will Adler of Silver State Government Relations, submitted a petition to the CCB requesting similar lot size increases. That petition explicitly stated:

"Adjusting lot sizes upwards from the current five pounds for flower and 15 pounds for trim to 50 pounds for each. In speaking with licensees, between 5% and 10% of the final retail cost of cannabis can be traced back to laboratory testing expenses. In reviewing other western states, nearly all have either a higher testing threshold or test an entire harvest similar to our batch. California and Oregon have a limit of 50 pounds, whereas Colorado tests by the lot the entire harvest. Earlier this year, Washington removed their five pound lot limit for testing and, instead, based their testing samples on harvest size through a sliding scale of up to 50 pounds."

The 2022 petition noted that MSO's concerns about cost reduction were a primary motivation. However, it was not pursued to completion at that time. This establishes that MSO has been working toward this objective for at least three years—well before the September 2024 petition.

MSO's Economic Justification: Profitability Over Safety

The petition's concluding paragraphs reveal MSO's true priorities. While acknowledging that "Nevada's cannabis licenses are having their most difficult year yet," the petition emphasized economic pressures as the rationale for reduced testing: "Many businesses have reported they

are not sure if they can make it another year. With inflation, workforce issues, the struggles with 280E, and the increase in interest rates Nevada's cannabis operators need a change to bring economic relief."

This economic framing is critical because it explicitly prioritizes operator profitability over consumer safety. The petition made no substantive argument that larger lot sizes would maintain or improve safety standards. Instead, it argued that other states have larger lot sizes (an appeal to common practice rather than scientific evidence) and that Nevada operators needed "economic relief" through reduced testing costs.

The MSO Petition and Presentation (September 19, 2024)

According to the official CCB meeting minutes, the petition was presented by:

- Will Adler (Silver State Government Relations) - MSO's contracted lobbyist
- Tiffany Newborn Johnson (Director of Government Affairs for MSO)
- MSO employee (Director of Quality Control for MSO) - also known by three versions of her first, middle and last names

The meeting minutes document that MSO employee "provided data which showed no direct correlation between lot size and safety in other states with larger lot sizes." This claim would become central to MSO's subsequent efforts.

MSO's Specific Requests

The petition sought to amend Nevada Cannabis Compliance Regulations (NCCR) 1, 6, and 11 to:

- Increase flower lot sizes from 5 pounds to 50 pounds
- Increase trim lot sizes from 15 pounds to 50 pounds
- Remove the "production run" definition requirement limiting concentrated cannabis to 2.2-pound increments
- Eliminate testing requirements at every step of the production process, requiring testing only on final products
- Streamline R&D processes to eliminate CCB approval requirements

The Scientific Debate: BOTEC Report and Statistical Evidence

The meeting minutes reveal that CCB staff, particularly Chief Kara Cronkhite and Vice-Chair Rianna Durrett, raised significant concerns about the scientific basis for increasing lot sizes. The discussion centered on the BOTEC report (a 2013 study commissioned by Washington State) and statistical sampling methodologies.

From the September 19, 2024 Meeting Minutes:

"Chief Cronkhite provided response on lot size sampling methodologies, potency and purity of lots and test results and the variability based on sample size. Vice-Chair Durrett asked which paragraph in the report mentions sample size and results: that five pounds will get consistent results, and over 5 pounds will be inconsistent. Chief Cronkite explained the relationship

between lot size sampling methodologies and the statistical reliability of test results, noting that larger lot sizes increase sampling variability."

This exchange is critical because it demonstrates that CCB staff had specific scientific evidence—rooted in the BOTEC report's statistical analysis—supporting the 5-pound lot size limit and sampling criteria.

Opposition from Industry Experts

The meeting minutes document substantial opposition from cannabis industry professionals, testing laboratories, and scientific experts:

Kimberly Maxson-Rushton (Cooper Levenson law firm) and Adam Fulton (Jennings and Fulton law firm): Warned that "larger lot sizes could increase the risk of microbial contamination" and "highlighted studies from 2013 and 2023 that support Nevada's current regulations." They specifically cautioned that "eliminating aspergillus testing could lead to undetected mold contamination, potentially causing harm to consumers."

Timothy Eli Addo (public commenter representing consumers and cultivation employees): Called out that "the request for lot size increase is based on profit" rather than consumer safety.

CCB Chairwoman's Motion to Reject

After extensive discussion, CCB Chairwoman Adriana Guzmán Fralick made the motion to deny the petition without prejudice. The minutes record the final vote:

"Chair Guzmán Fralick moved to deny the petition without prejudice. The motion was seconded by Member Durrett. Chair Guzmán Fralick, Member Durrett and Member Merritt in favor. Member Douglas and Member Mazzorana opposed. Motion carried."

Critically, Chairwoman Guzmán Fralick explicitly stated that the denial was based on:

- Need for more scientific data and documentation
- Public health and safety concerns
- Desire to allow MSO to return with stronger evidence after further research

The Predicted Legislative Pivot

Discussion at the meeting reveal a prescient observation: There was discussion during and after the September 19, 2024 meeting that MSO would likely turn to the legislature to achieve these regulatory changes that the CCB had rejected on safety grounds.

This prediction proved accurate. Rather than returning to the CCB with additional scientific evidence as suggested, MSO immediately launched a legislative campaign.

The Legislative Campaign and ASTM Manipulation

SB 157: Introduction and Passage

Following the CCB's rejection, MSO executed a sophisticated two-track strategy: pursue legislative action through SB 157 while simultaneously, through its employee, guiding ASTM International standards to provide technical cover for the legislative changes.

SB 157 was introduced by Senator Edgar Flores on February 2, 2025—less than five months after the CCB rejection. The bill mandated adoption of ASTM D8334/D8334M-20, which at that time contained the 15-pound maximum lot size limitation.

The Critical Timeline: Coordinated Actions Across Three Fronts

The sequence of events from March 27 to May 23, 2025 reveals extraordinary coordination:

- March 27, 2025 (Thursday): SB 157 passes the Nevada Senate
- March 29, 2025 (Saturday): ASTM Workshop WK94344 initiated—just two days after Senate passage. Stated purpose: "Revamping standard to make more appropriate for industry, align with global standards, and remove the 15lb max batch size." Technical Contact: MSO Employee (MSO's Quality Director)
- March 31, 2025 (Monday): SB 157 read in the Nevada Assembly
- May 23, 2025: Amendment 741 introduced—changing bill language from "ASTM D8334-20" to "most current version of ASTM D8334"

This timeline demonstrates deliberate orchestration. **The ASTM workshop was initiated on a Saturday—an unusual day for technical standards work—immediately following Senate passage and before Assembly consideration. This timing strongly suggests the workshop was pre-planned and held in reserve, to be activated only after Senate approval.**

MSO Employee 's Dual Role: The Conflict of Interest

MSO Employee MSO employee holds multiple positions that create extraordinary conflicts of interest:

- Quality Director at MSO since September 2023
- Chair of ASTM D37.02 Technical Subcommittee on Cannabis Testing and Laboratory Operations since December 2018
- Member of ASTM Committee on Technical Committee Operations (COTCO) since January 2023
- Technical Contact for ASTM Workshop WK94344 (initiated March 29, 2025)

Evidence from LinkedIn Profile

MSO employee's LinkedIn profile provides direct evidence of her intentions and loyalties. In a post dated just before the September 19, 2024 CCB meeting, she wrote:

"ASTM International's Technical Committee D37 for Cannabis has been diligently crafting industry standards since 2017, filling a crucial need for standardization in this rapidly evolving sector."

Her profile also reveals her explicit bias toward multi-state operators (MSOs) like MSO. She has stated her goal is to "promote large MSO membership and promote their well-being" within ASTM committees. This creates an inherent conflict: as Chair of D37.02, she has the authority to shape technical standards that directly affect her employer's regulatory burden and profitability.

ASTM D37 Committee Structure and The Role of Dave Vaillencourt

While MSO's Employee chairs the D37.02 subcommittee on testing, the overall ASTM D37 Committee on Cannabis is led by Dave Vaillencourt, who serves as Vice-Chair. Vaillencourt's LinkedIn profile reveals he is:

- Vice-Chair of ASTM Committee D37 on Cannabis (since January 2022)
- Founder and Board Member of S3 Collective
- Chief Executive Officer of The GMP Collective (since December 2018)
- ASTM Approved Instructor

The GMP Collective's 2024 sales materials reveal a business model built explicitly on helping cannabis operators reduce regulatory costs. The cover of their sales guide prominently features the tagline: "REDUCE COSTS, MITIGATE RISKS, FUTURE PROOF YOUR INVESTMENT." Under their "Strategic Advising and Technical Expertise" services, **The GMP Collective explicitly lists "ASTM Standards Development and Benchmarking" as a core offering—making it clear that Vaillencourt's company profits directly from shaping the very ASTM standards that his committee oversees.**

This creates a direct and obvious financial conflict of interest: Vaillencourt earns consulting revenue by helping cannabis companies reduce costs through "ASTM Standards Development," while simultaneously serving as Vice-Chair of the ASTM committee that develops those standards. When companies pay The GMP Collective to help them navigate and influence ASTM standards, they are paying the Vice-Chair of the committee to make standards more industry-friendly and less costly to comply with.

The GMP Collective's influence extends beyond direct consulting. Their 2024 "Thought Leadership Sponsorship Package" materials advertise a monthly webinar series titled "When Things Go Wrong" targeting industry professionals. For $3,000, sponsors receive access to a "high-quality curated email list averaging 3,000 recipients, including government regulators, lawmakers, direct-to-plant C-suite executives, laboratory professionals, and beyond." **This marketing reveals The GMP Collective's deliberate cultivation of relationships with the very regulators and lawmakers who would oversee any standards changes—creating a sophisticated influence network that benefits from standards that reduce industry costs.**

The Vaillencourt- Structural Conflict

While there is no direct evidence that Vaillencourt coordinated with MSO's Employee on WK94344, his position as Vice-Chair of D37 means he has oversight authority over all subcommittee activities, including 's D37.02 testing standards work. More critically, MSO's Employee's employer is exactly the type of company that The GMP Collective markets its services to—large multi-state operators seeking to "reduce costs" and "future proof" their operations through favorable regulatory frameworks.

The structural conflict is clear: The Vice-Chair of ASTM D37 operates a consulting business that profits from helping cannabis companies reduce compliance costs through ASTM standards development, while a MSO employee chairs the testing subcommittee and initiates standards changes that reduce her employer's testing costs. Both benefit from the same outcome—less stringent testing requirements—and both have positioned themselves to influence the ASTM standards process that Nevada's legislature just made automatically binding on state law.

Amendment 741: The Automatic Adoption Mechanism

The May 23, 2025, amendment to SB 157 represents the linchpin of MSO's strategy. By changing the reference from "ASTM D8334/D8334M-20" (the 2020 version) to "the most current version of ASTM D8334/D8334M," the amendment created an automatic mechanism for 's ASTM changes to become Nevada law without further CCB review.

This is regulatory capture in its purest form: a private industry employee gains the power to unilaterally change state law by modifying a voluntary consensus standard.

The ASTM Five-Year Review Cycle: Planned Obsolescence

ASTM International's regulations require review and revision of standards every five years. The current ASTM D8334/D8334M-20 was published in 2020, making 2025 the mandatory revision year.

This means 's workshop to remove the 15-pound limitation was not premature or unusual—it was precisely timed to coincide with the mandatory revision cycle. **However, the coordination with SB 157's passage and Amendment 741 suggests strategic planning rather than routine standards maintenance.**

When WK94344 completes its revisions and publishes the updated standard (likely designated D8334-25), Nevada law will automatically adopt those changes—including removal of the 15-pound lot size limitation—without any opportunity for CCB review, public comment, or legislative oversight.

The R152-24 Regulatory Framework: Systematic Delegation and Compliance Impossibility

The Cannabis Compliance Board's proposed regulation R152-24 (dated August 19, 2025) represents a fundamental restructuring of Nevada's cannabis testing regulatory framework that creates unprecedented constitutional violations and imposes extinction-level compliance

burdens on testing laboratories. Critical comparative analysis reveals that R152-24 makes substantive changes from the May/June 2024 proposed NCCR amendments that fundamentally alter the regulatory landscape in ways that suggest coordination with SB 157's passage and an attempt to salvage its constitutionally defective provisions.

Adoption of 37+ Private Standards with Automatic Updates

R152-24 Section 61 adopts by reference the **"most current version"** of 37+ separate standards, guidelines, and publications from multiple private organizations including ASTM International, AOAC, ISO, WHO, OECD, FDA, USDA, and OSHA. This wholesale adoption creates an unprecedented regulatory structure where Nevada law automatically incorporates changes made by private standard-setting bodies over which the state has no control.

The 37+ adopted standards include:

- ASTM standards (D8282, D8347, D8244, **D8334** - mandated by SB 157)
- AOAC Official Methods of Analysis ($950 publication) and multiple AOAC appendices
- ISO/IEC standards including 16140-3 ($157) and 17025 ($201)
- ALACC Guidelines ($336 for non-members)
- 16 separate AOAC Standard Method Performance Requirements (SMPRs)
- Multiple FDA, USDA, OSHA, WHO, and OECD guidance documents

These standards update at vastly different rates—ASTM standards update every 1-3 years, AOAC methods continuously, ISO standards every 3-5 years, and FDA manuals continuously—creating an impossible monitoring burden for laboratories that must track dozens of independent standard-setting bodies for updates.

The "Auto-Adopt Unless Rejected" Mechanism

R152-24 Section 61(4) creates an unprecedented automatic adoption mechanism that **reverses normal administrative process**:

> *"The Board will periodically review the publications adopted by reference in subsections 1 and 2 and determine, within 30 days after the review, whether any change made to such a publication is appropriate for application in this State.* ***If the Board does not disapprove a change to an adopted publication within 30 days after the review, the change is deemed to be approved by the Board****."*

This provision fundamentally violates Nevada administrative law principles:

- **Reverses burden of action**: Normal process requires agencies to affirmatively adopt changes; R152-24 requires affirmative rejection or changes automatically become Nevada law
- **Inadequate review period**: 30 days is insufficient for meaningful stakeholder input, scientific analysis, and impact assessment of complex technical standards

- **Circumvents NRS 233B requirements**: Each standard update effectively amends Nevada regulations, yet automatic adoption bypasses required notice, comment, and hearing procedures
- **Exceeds CCB authority**: The CCB has no statutory authority under SB 157 or any other Nevada law to delegate rulemaking authority to private organizations through automatic adoption mechanisms, except for ASTM D8334 provisions which it is bound to adopt without any review options. Changes to ASTM D8334 become Nevada law regardless of their consequences.

The practical reality is that the CCB **cannot possibly review, evaluate, and issue disapprovals for updates to 37+ standards from multiple organizations within 30 days**. Automatic adoption of all updates becomes the de facto rule, regardless of Nevada's public health needs or stakeholder concerns.

Critical Deletions: Removal of Guidance and Conflict Resolution Provisions

Comparison of R152-24 with the May/June 2024 proposed NCCR amendments reveals deliberate deletion of critical regulatory oversight mechanisms that had been included in earlier drafts:

Deletion of NCCR 11.025(1)(g) - Board Guidance Authority

May/June 2024 language (PRESENT): "Should any conflicts between references be identified, the Board shall issue guidance."

R152-24 (DELETED): This conflict resolution provision is completely absent.

Impact: With 37+ standards from different organizations (ASTM, AOAC, ISO, WHO, OECD, FDA, USDA, OSHA), conflicts are inevitable. When ASTM D8334 conflicts with ISO 17025, or AOAC validation requirements conflict with ASTM D8282, or quality control frequency requirements differ across multiple standards, **laboratories have no regulatory guidance on which standard controls**. This creates:

- Legal uncertainty - laboratories cannot determine compliance with confidence
- Arbitrary enforcement - CCB's enforcement actions become unpredictable without clear standards
- Massive compliance costs - laboratories will require experts to analyze all 37+ standards and make independent conflict determinations (estimated $100,000-$500,000+ per laboratory for initial analysis, plus ongoing monitoring costs)

Deletion of NCCR 11.025(7)(e) - Board Agent Approval Authority

May/June 2024 language (PRESENT): "Any subsequent standard as approved by the appropriate Board Agent."

R152-24 (DELETED): Board Agent approval authority is eliminated.

Impact: This deletion shifts the regulatory paradigm from *active approval* (agency must affirmatively determine new standard is appropriate) to *passive disapproval* (agency need do

nothing; standard automatically adopted). **This circumvents NRS 233B requirements for notice, comment, and hearing when regulatory changes are made, eliminating public opportunity for input on standard updates that will become Nevada law.**

Evidence That R152-24 Was Written After SB 157 Passage

Critical analysis of R152-24's provisions reveals strong evidence that the regulation was drafted **after SB 157 became law in June of 2025,** and represents an attempt to salvage and operationalize the bill's constitutionally defective provisions:

- **Drops the "-20" suffix**: R152-24 Section 61 adopts "ASTM D8334" without version designation, mirroring SB 157's language change from earlier drafts that had specified "D8334-20"
- **Requires "most current version"**: This language directly tracks SB 157's mandate for alignment with ASTM standards' current versions, suggesting R152-24 was specifically designed to implement SB 157's automatic adoption scheme
- **Creates "deemed approved" mechanism**: The 30-day automatic adoption provision appears designed to operationalize SB 157's requirement for regulatory "alignment" with future ASTM changes, including MSO Employee 's Workshop WK94344 revisions
- **Timing of R152-24 (August 19, 2025)**: Filed two months after SB 157 passage (June 2025) and five months after ASTM Workshop WK94344 initiation (March 29), suggesting deliberate coordination

The May/June 2024 proposed NCCR amendments—drafted *before* SB 157 passage—contained Board guidance authority and Board Agent approval provisions, creating a regulatory framework with state oversight. R152-24's wholesale deletion of these provisions and insertion of automatic adoption language appears specifically designed to accommodate SB 157's passage and facilitate MSO Employee 's control over Nevada testing requirements through ASTM standard revisions.

Invalidation of Prior Small Business Impact Statements

The substantive changes between the May/June 2024 proposed NCCR amendments and R152-24 are so fundamental that **any prior Small Business Impact Statements are no longer accurate**. The earlier impact analyses could not have contemplated:

14. **Massive new compliance costs**: Laboratories must now continuously monitor 37+ separate standard-setting organizations, hire experts to analyze conflicting requirements, and create custom standard operating procedures attempting to satisfy all standards simultaneously—costs estimated at $100,000-$500,000+ per laboratory initially, plus substantial ongoing costs
15. **Elimination of regulatory certainty**: With no Board guidance authority and automatic adoption of standard updates, laboratories face continuous compliance uncertainty as requirements change without state review

16. **Acquisition costs for paywalled standards**: Laboratories must purchase access to standards costing from $44.95 to $950 per publication, with multiple publications required, plus subscription costs to monitor updates
17. **Legal defense costs**: Laboratories face potential disciplinary actions for following one standard over another when conflicts exist, requiring legal representation to challenge arbitrary enforcement
18. **Extinction-level market impacts**: These combined compliance burdens may force smaller independent laboratories out of business, consolidating the testing market in favor of MSO-affiliated laboratories that can afford massive compliance infrastructure—precisely the outcome MSO would have benefited from if its failed September 2024 petition had instead passed.

NRS 233B.0608 requires agencies to prepare a new Small Business Impact Statement whenever proposed regulations "may impose a direct and significant economic burden upon a small business or directly restrict the formation, operation or expansion of a small business." R152-24's wholesale adoption of 37+ standards with automatic updates and elimination of conflict resolution guidance **clearly imposes massive new burdens that were not contemplated in any prior impact analysis**.

CCB's Distribution of SB 157 Guidance

Adding to concerns about regulatory capture, the CCB's implementation process for SB 157 reveals **exclusion of testing laboratories from guidance distribution** while providing draft guidance to some cultivation facilities and other industry participants:

1. **September 19, 2025**: CCB sends email stating guidance would be distributed September 23 prior to September 25 webinar
2. **September 2025**: CCB distributes "draft" guidance to cultivation facilities and other industry participants, but **excludes all testing laboratories** from the distribution
3. **September 24, 2025**: CCB abruptly postpones September 25 webinar to September 30
4. **September 30, 2025**: Rescheduled webinar also canceled without explanation

Part VI: Comprehensive Recommendations for CCB Action

In light of the November 20, 2025, hearing on R152-24, the CCB should immediately :

1. Compel Testimony from MSO's Employee

The CCB should immediately request MSO's Employee to testify under oath before the full Board regarding:

The timeline and planning process for initiating ASTM Workshop WK94344:

- When was the workshop first conceptualized?
- Why was it initiated on Saturday, March 29, 2025—just 48 hours after SB 157 passed the Senate?

- Was MSO's management aware of the workshop timing relative to SB 157's legislative progress?

Her multiple roles and conflicts of interest:

- How does she reconcile serving simultaneously as MSO's Quality Director and ASTM D37.02 Subcommittee Chair?
- Did MSO direct or encourage her ASTM activities related to lot size standards?
- Has she discussed the WK94344 workshop with MSO executives, Senator Flores's office, or others involved in the passage of SB157?

Expected timeline for completing WK94344 revisions:

- When will the revised standard (D8334-25) be published?
- What is the standard ASTM process for revision, review, and final approval?
- Will the final version remove all lot size limitations or impose a different maximum?

Her LinkedIn statements about promoting MSO interests:

- How does her stated goal to "promote large MSO membership and promote their well-being" affect her ASTM standards work?
- Does she believe ASTM D37.02 should prioritize MSO's cost reduction over consumer safety?

2. Require Independent ASTM Verification
The CCB should call high-level ASTM staff (independent of MSO's Employee) to testify regarding:

- Standard ASTM workshop timelines and procedures
- Whether initiating workshops on Saturdays is common practice
- ASTM conflict of interest policies for committee members who are employees of regulated entities
- The five-year review cycle requirements and whether the WK94344 timing was mandatory or discretionary

Regulatory Safeguards to Prevent Future Capture

1. Reject Automatic Adoption Provisions
The CCB must reject the automatic adoption provision in R152-24 Section 61. The principle that "silence equals consent" fundamentally violates regulatory oversight responsibilities.

Recommended alternative language for R152-24 Section 61:

"The Board adopts by reference ASTM D8334/D8334M-20 (2020 version), Standard Practice for Sampling of Cannabis/Hemp Post-Harvest Batches for Laboratory Analyses, as published by ASTM International. Any subsequent revisions to this standard must be affirmatively approved by the Board through formal rulemaking procedures before becoming effective under Nevada

law. The Board shall review proposed revisions within 90 days of publication and may accept, reject, or modify such revisions through its normal regulatory process."

2. Implement Conflict of Interest Disclosure Requirements
The CCB should adopt regulations requiring:

- Mandatory disclosure of ASTM committee membership for any person testifying before the CCB on technical standards
- Disclosure of employer relationships for ASTM committee officers who participate in Nevada cannabis standards development
- Recusal requirements when ASTM committee members have direct financial interests in regulatory outcomes
- Prohibition on receiving testimony from members of ASTM committee leadership who also hold financial interests in consulting firms that market "ASTM Standards Development" services to cannabis operators, or requiring such committee officers to divest from such firms or resign from ASTM leadership

3. Establish Independent Scientific Review
The CCB should create an independent scientific advisory panel to:

- Review proposed ASTM standard changes before CCB adoption
- Evaluate the scientific evidence supporting lot size increases
- Conduct independent statistical analysis of sampling protocols
- Assess public health and safety implications of testing protocol changes

4. Require Public Notice and Comment for All Testing Standard Changes
The CCB should adopt procedures which at a minimum require:

- Minimum 60-day public notice period for any proposed ASTM standard adoption or revision
- Public hearings with opportunities for testing laboratories, consumer advocates, and public health experts to comment
- Written findings documenting the scientific and public safety basis for adopting ASTM changes
- Economic impact analysis showing cost-benefit tradeoffs between testing efficiency and consumer safety

Scientific Requirements for Valid Testing

1. Recognize the Fundamental Sampling Deficiency
Both SB 157 and ASTM D8334 minimal requirements are based on misunderstandings of statistical sampling theory that render testing results scientifically invalid for lots exceeding 5 pounds.

2. Implement Proper Sampling for Complete Programs
Establish requirements for collecting sufficient material to support testing, retesting, and retention while maintaining the 0.88% sampling rate for each analytical event through proper homogenization.

3. Mandate Proper Homogenization Practices
Require that the entire sample representing 0.88% of the lot weight be homogenized together before division into analytical portions.

4. Establish Scaled Requirements
Implement scientifically justified sample sizes:

- 5-pound lots: 60 grams collected and homogenized (3 × 20g)
- 10-pound lots: 120 grams collected and homogenized (3 × 40g)
- 15-pound lots: 180 grams collected and homogenized (3 × 60g)

5. Monitor Public Health Outcomes
Track contamination detection rates and analytical reproducibility to validate the effectiveness of proper sampling.

6. Reject Fixed-Sample Approaches
Abandon any sampling scheme that does not scale proportionally with lot size.

7. Maintain Constitutional Oversight
Preserve state authority to modify or reject private standard updates that conflict with scientific principles or Nevada law.

Part VII: Legal Safeguards to Prevent Future Regulatory Capture

Constitutional Safeguards

1. Version-Specific Adoption
Nevada should return to its historical practice of adopting specific versions of external standards (e.g., "ASTM D8334-20") rather than "most current version" language. This preserves legislative and regulatory review authority for future changes.

2. State Amendment Authority
Regulatory language should explicitly preserve CCB authority to modify ASTM requirements when scientific evidence or public health concerns justify different approaches.

3. Periodic Review Requirements
Establish mandatory CCB review of adopted standards every 3-5 years, with public notice and comment periods for any proposed changes.

Transparency and Accountability

1. Lobbying Disclosure
Require disclosure of:

- All communications between cannabis operators and ASTM committee members regarding Nevada-specific standards
- Consulting relationships between ASTM committee officers and Nevada cannabis licensees
- Financial contributions from cannabis operators to ASTM committee activities

2. Meeting Transparency
Require CCB to maintain public records of all meetings, communications, and correspondence related to testing standards development, including contacts with ASTM committee members and industry representatives.

3. Economic Impact Analysis
Mandate comprehensive economic impact analysis for any proposed testing requirement changes, including costs to small operators and competitive effects favoring large multi-state operators.

Public Health Protection

1. Consumer Representation
Ensure consumer advocates, patient representatives, and public health experts have meaningful participation in standards development processes.

2. Independent Laboratory Input
Require that testing laboratories have equal or greater representation than cultivation/production operators in any advisory committees on testing standards.

3. Safety-First Presumption
Establish regulatory presumption that any proposed testing changes must demonstrate maintenance or improvement of consumer safety, with burden of proof on proponents of reduced testing requirements.

Part VIII: Detailed Analysis of R152-24 Automatic Adoption Mechanism

As detailed in Part V's analysis of the November 2025 hearing, the procedural posture of R152-24's adoption raises fundamental concerns. The Legislative Counsel Bureau's Draft Proposed Regulation R152-24 contains several provisions that fundamentally alter Nevada's regulatory framework for cannabis testing. Most critically, Section 61 introduces an automatic adoption mechanism that reverses traditional regulatory procedures and creates unprecedented delegation of state authority to private organizations.

The Critical Regulatory Language

Section 61, subsection 4 of R152-24 states:

> "The Board will periodically review the publications adopted by reference in subsections 1 and 2 and determine, within 30 days after the review, whether any change made to such a publication is appropriate for application in this State. If the Board does not disapprove a change to an adopted publication within 30 days after the review, the change is deemed to be approved by the Board."

Legal Analysis of the Automatic Adoption Provision

Questionable Legal Authority

The automatic adoption mechanism in R152-24 Section 61(4) likely exceeds agency authority for several reasons:

- **Reverses the Burden of Review:** Nevada's precedents (NAC 512.562, NAC 477.283) preserve "administrative authority to disapprove" within specified timeframes, but the default in those cases is NOT automatic adoption—it is maintaining the status quo. **The CCB's "silence equals consent" provision reverses this: inaction equals automatic adoption.**
- **Inadequate Timeframe:** Nevada precedents typically allow 60-180 days for review. CCB proposes only 30 days. This is insufficient for: (a) technical review by CCB staff; (b) public notice and comment; (c) Board meeting scheduling (CCB meets monthly); (d) scientific peer review; and (e) legal analysis.
- **Vague Trigger Mechanism:** "Periodically review"—When? How often? Who determines when review occurs? What if ASTM publishes changes but CCB doesn't know about them? What if CCB misses the 30-day window due to meeting schedules?
- **Violates Affirmative Adoption Principle:** NRS 233B.040(4) requires agencies to "adopt" regulations through affirmative action. **"Deemed to be approved" is passive adoption by inaction. This appears to conflict with the statutory requirement for active agency decision-making.**

Failure to Meet NRS Chapter 233B Requirements

The automatic adoption mechanism is insufficient to meet Nevada's Administrative Procedure Act requirements:

- **Fails Affirmative Adoption Standard:** Nevada law recognizes two approaches: (1) dynamic incorporation with oversight (agency retains power to review and reject); and (2) static incorporation (agency adopts specific version, reviews updates before adopting). The CCB's provision attempts a third approach—automatic incorporation unless rejected—which is unprecedented in Nevada law.
- **Insufficient Review Period:** Compared to Nevada precedents (NAC 512.562, NAC 477.283) with 60-180 day review periods, CCB's 30-day window is inadequate. CCB meets monthly and may miss the window entirely, leaving no time for staff analysis, legal review, or public input.

- **Lacks Required Procedural Safeguards:** Nevada's adoption by reference precedents typically include: (a) public notice; (b) comment period; (c) written findings; (d) meeting requirement; and (e) economic impact analysis. R152-24 Section 61(4) includes none of these safeguards.
- **Creates Constitutional Problems:** The provision exacerbates rather than solves the constitutional delegation problem by making private organization changes automatically binding on Nevada without any state review process.

Comparison to Nevada's Historical Practice

Nevada has historically employed two constitutionally sound approaches to adopting external standards:

Valid Nevada Approach (NAC 512.562 Example)

- **Agency adopts specific version of external standard**
- When updates are published, agency has 60-180 days to review
- Agency retains authority to disapprove updates
- **Default equals status quo (no change unless agency acts)**
- Public notice and comment required
- **Board must affirmatively vote to adopt updates**

This contrasts with the CCB's newly proposed approach:

CCB's Proposed Approach (R152-24 Section 61)

- Agency adopts "most current version" (moving target)
- When updates published, agency has only 30 days to review
- Agency must actively disapprove or changes are automatic
- Default equals automatic adoption (change unless agency acts)
- No public notice/comment specified
- **Board inaction equals adoption (reverses burden)**

Summary of Legal Deficiencies

The CCB's proposed review process in R152-24 Section 61(4) is legally insufficient because it:

- Establishes an insufficient timeframe (30 days versus Nevada's typical 60-180 days)
- **Reverses the burden of action (automatic adoption rather than affirmative adoption requirement)**
- **Lacks procedural safeguards (no public notice, comment period, written findings, or economic analysis)**
- Contains vague trigger mechanisms ("periodically review" with no clear timing or process)
- **Violates NRS 233B.040 by enabling passive adoption rather than active "adoption" of regulations**
- **Provides insufficient oversight to cure constitutional delegation problems**
- Creates practical impossibility (CCB meets monthly; 30-day window could expire between meetings)

Recommended Alternative Regulatory Language

To meet Nevada's legal standards and constitutional requirements, R152-24 Section 61 should be revised to state:

> "The Board adopts by reference ASTM D8334/D8334M-20 (2020 version). The Board may adopt subsequent revisions to this standard through formal rulemaking procedures. When a revision is published, the Board shall: (1) Provide public notice within 30 days of publication; (2) Conduct a minimum 60-day public comment period; (3) Review the revision at a public meeting within 90 days; (4) Prepare written findings documenting: scientific basis for adoption or rejection, public health and safety impacts, economic impacts on licensees, and consistency with Nevada law; (5) Vote to affirmatively adopt, adopt with modifications, or reject the revision; and (6) If adopted, file the updated standard with the Secretary of State and State Library per NRS 233B.040(3). No revision shall become effective in Nevada until affirmatively adopted by the Board through this process."

Conclusion Regarding R152-24 Section 61(4)

The CCB's proposed 30-day "review" provision: (1) is legally questionable under Nevada law; (2) does NOT meet Nevada's existing standards for adoption by reference; (3) fails to provide sufficient oversight to cure constitutional delegation problems; (4) reverses the burden from affirmative adoption to passive acceptance; (5) provides inadequate timeframe for meaningful review; and (6) lacks procedural safeguards present in other Nevada regulations. This provision should be rejected and replaced with language requiring affirmative Board adoption through formal rulemaking with adequate timeframes and public participation.

Conclusion

The analysis presented in this comprehensive document reveals that Nevada's current approach to cannabis testing suffers from fundamental statistical deficiencies that compromise both public safety and regulatory integrity. SB 157's minimal sampling requirements, ASTM D8334's fixed-sample approach, and widespread misunderstanding of homogenization requirements create a perfect storm of inadequate testing.

The urgency of these concerns is underscored by ongoing regulatory proceedings. The Cannabis Compliance Board's Notice of Intent for a November 20, 2025 hearing to adopt R152-24 amendments reveals that the regulatory framework was substantially modified between the June 2024 workshops and the August 2025 Legislative Counsel Bureau version—timing that suggests the regulations were rewritten after SB 157's passage to facilitate its implementation. This procedural irregularity, combined with R152-24's automatic adoption provisions and elimination of Board oversight mechanisms, demonstrates that regulatory capture is not merely historical but actively ongoing. The Board faces an immediate decision point that will either restore constitutional governance or cement private industry control over Nevada's cannabis testing framework.

The mathematical reality is unforgiving: proper cannabis testing for 15-pound lots requires collecting and homogenizing 180 grams of material (2.65% of the lot) to maintain statistical validity across testing, retesting, and retention requirements. This is not a matter of regulatory preference or industry convenience—it is a scientific necessity derived from fundamental statistical principles.

The documentary evidence compiled in this analysis proves that Nevada's cannabis testing framework suffers from coordination between MSO, ASTM International leadership, and Nevada legislators that circumvented normal regulatory processes. What MSO could not achieve through the Cannabis Compliance Board's science-based review on September 19, 2024, they achieved through legislative engineering and ASTM standards capture. MSO successfully maneuvered the legislature into outsourcing Nevada law to their own employee.

The economic costs of implementing proper sampling are substantial but pale in comparison to the costs of continued inadequate testing: contaminated products reaching consumers, false regulatory actions, laboratory accreditation failures, and catastrophic public health events. The cannabis industry must choose between the immediate costs of proper sampling and the devastating long-term costs of statistical inadequacy.

The Cannabis Compliance Board faces a critical choice: implement scientifically defensible requirements that actually protect public health, or continue the illusion of safety that industry wrote for itself. The statistical evidence is unambiguous—current requirements render testing meaningless. Nevada has an opportunity to lead by implementing the nation's first truly scientific cannabis testing program. The alternative—continuing with statistically invalid testing—is both scientifically indefensible and ethically and morally unacceptable.

Implementation will require substantial resources, extended timelines, and industry-wide commitment to scientific rigor. However, the alternative—continuing with statistically meaningless testing—is both scientifically indefensible and ethically unacceptable. Nevada must lead by implementing the first truly scientific cannabis testing program in the United States.

Technical Appendix A: Statistical Methodology and Calculations

A.1 Detection Probability Calculations Using Binomial Distribution

A.1.1 Theoretical Foundation

The probability of detecting contamination in a lot follows the binomial distribution, which is the standard statistical method for acceptance sampling in food safety and quality control. The basic formula is:

$P(\text{detection}) = 1 - (1 - p)^n$

Where:

- p = proportion of the lot that is contaminated

- n = effective number of independent sampling units

A.1.2 Calculating Effective Sample Size (n)

The critical parameter requiring explanation is "n" - the effective number of independent sampling units. This depends on both the sample size and the degree of homogenization:

For properly homogenized samples: n = (Homogenized Sample Weight) / (Minimum Detectable Unit Size)

For cannabis testing, assuming a minimum detectable unit of approximately 1 gram (based on typical analytical subsample sizes):

- 20g properly homogenized sample: n ≈ 20 independent units
- 60g properly homogenized sample: n ≈ 60 independent units

However, for inadequately homogenized samples, the effective n is dramatically reduced because the material consists of heterogeneous "clumps" rather than thoroughly mixed particles:

- 20g collected but poorly mixed: n ≈ 2-4 independent clumps
- 60g collected but poorly mixed: n ≈ 5-10 independent clumps

A.1.3 Worked Example: 5% Contamination Detection

Scenario: A 15-pound (6,804g) cannabis lot contains localized contamination affecting 5% of the material.

Case 1: Current Practice (20g collected, inadequate homogenization)

Effective n ≈ 2.5 independent clumps (due to poor mixing)

- P(detection) = 1 - (1 - 0.05)^2.5
- P(detection) = 1 - (0.95)^2.5
- P(detection) = 1 - 0.8789
- P(detection) = 0.121 or 12%

Case 2: Proper Practice (60g properly homogenized)

Effective n ≈ 7.5 well-mixed units (assuming even with good homogenization, some spatial correlation remains)

- P(detection) = 1 - (1 - 0.05)^7.5
- P(detection) = 1 - (0.95)^7.5
- P(detection) = 1 - 0.6920
- P(detection) = 0.308 or 31%

Case 3: Ideal homogenization (60 fully independent units)

- P(detection) = 1 - (1 - 0.05)^60

- P(detection) = 1 - (0.95)^60
- P(detection) = 1 - 0.0458
- P(detection) = 0.954 or 95%

A.1.4 Worked Example: 3% Contamination Detection

Scenario: A 15-pound (6,804g) cannabis lot contains localized contamination affecting 3% of the material.

Case 1: Current Practice (20g collected, inadequate homogenization)

Effective n ≈ 3 independent clumps (due to poor mixing)

$P(\text{detection}) = 1 - (1 - 0.03)^3$

$P(\text{detection}) = 1 - (0.97)^3$

$P(\text{detection}) = 1 - 0.9127$

P(detection) = 0.087 or 9%

Case 2: Proper Practice (60g properly homogenized)

Effective n ≈ 7.5 well-mixed units (assuming even with good homogenization, some spatial correlation remains)

$P(\text{detection}) = 1 - (1 - 0.03)^{7.5}$

$P(\text{detection}) = 1 - (0.97)^{7.5}$

$P(\text{detection}) = 1 - 0.7941$

P(detection) = 0.206 or 21%

Statistical Assumptions and Calculations:

- The effective number of independent samples (n_{eff}) is reduced from the sample weight in grams due to inadequate homogenization creating correlated "clumps" rather than independent sampling units.
- For poorly mixed 20g samples, $n_{eff} \approx 3$ represents approximately 3 independent clumps of material.
- For properly mixed 60g samples, $n_{eff} \approx 7.5$ accounts for improved homogenization while recognizing that perfect independence is rarely achieved in practice.
- The failure rate is calculated as 1 minus the detection probability. For Current Practice with 9% detection, the failure rate is 91% (1 - 0.09 = 0.91).

A.2 Measurement Uncertainty Budget Development

A.2.1 Theoretical Framework

Total measurement uncertainty is calculated using the root sum of squares (RSS) method mandated by ISO/IEC 17025:

$U_{total} = \sqrt{(U_{sampling}^2 + U_{homogenization}^2 + U_{analytical}^2 + U_{other}^2)}$

A.2.2 Component Uncertainty Derivations

A.2.2.1 Sampling Uncertainty ($U_{sampling}$)

Sampling uncertainty derives from fundamental sampling theory:

$U_{sampling} = (CV / \sqrt{n}) \times 100\%$

Where:

- CV = coefficient of variation of the lot (20% for cannabis)
- n = number of increments in the composite sample

For inadequate sampling:

- 20g from 15-lb lot (0.29% rate): $n \approx 1.5$ increments
- $U_{sampling} = 20\% / \sqrt{1.5} \times 100\% = 16.3\%$

For the conservative estimate accounting for extreme heterogeneity:

- $U_{sampling} \approx 78\%$ (models $n \approx 0.066$ effective increments, representing very poor sampling)

A.2.2.2 Homogenization Uncertainty ($U_{homogenization}$)

Homogenization uncertainty depends on particle size distribution and mixing efficiency:

$U_{homogenization} = CV_{residual} \times \sqrt{(1 - \text{mixing efficiency})}$

For cannabis with 20% baseline CV:

- Poor homogenization (60% efficiency): $U_{homogenization} = 20\% \times \sqrt{0.4} = 12.6\%$
- Very poor homogenization (10% efficiency): $U_{homogenization} = 20\% \times \sqrt{0.9} = 19.0\%$

The estimate of 65% for inadequate practice suggests severe unmixing or <5% mixing efficiency.

A.2.2.3 Analytical Uncertainty ($U_{analytical}$)

Typical for HPLC or GC methods. Components include:

- Instrument precision: ±3-5%
- Method repeatability: ±4-6%
- Calibration uncertainty: ±2-3%

Combined: $U_{analytical} = \sqrt{(5^2 + 5^2 + 3^2)} = 7.4\%$

The conservative estimate of 10% is reasonable.

A.2.3 Worked Example: 15-Pound Lot Uncertainty Cascade

Assumptions for 15-Pound Lot Statistical Comparison Table:

- **Effective n (homogenization quality):** This parameter represents the effective number of independent sampling units after accounting for homogenization quality. For Current Flawed Practice with poor mixing of 20g samples, n≈2.5 reflects the presence of correlated "clumps" rather than independent particles. For Required Scientific Practice with proper homogenization of 60g samples, n≈7.5 accounts for improved mixing while recognizing that perfect independence is rarely achieved in practice.
- **Statistical confidence:** Calculated using the formula for confidence intervals with small sample sizes. Current Practice achieves only 51% confidence (below the 95% standard) due to inadequate sampling rate (0.29%) and poor homogenization. Required Scientific Practice achieves 95% confidence through proper sampling rate (0.88%) and homogenization.
- **Margin of error:** Derived from the coefficient of variation (CV) formula: MoE = CV / $\sqrt{n_{eff}}$. Assuming CV=20% (typical for cannabis), Current Practice yields ±17.4% margin of error (20% / √2.5), while Required Practice achieves ±5% (20% / √7.5 ≈ 20% / 2.74).
- **Detection probability:** Calculated using the binomial formula P(detection) = 1 - (1-p)^n_{eff}. For 5% contamination with Current Practice: 1-(0.95)^2.5 = 0.122 ≈ 12%. For Required Practice: 1-(0.95)^7.5 = 0.308 ≈ 31%. Similar calculations apply to 10% contamination scenarios.
- **Statistical power:** Represents the probability of correctly rejecting a false null hypothesis. Calculated for a two-sample proportion test with α=0.05 and effect size based on 20% absolute difference in detection rates. Current Practice achieves only 0.21 power (far below the 0.80 standard), while Required Practice achieves adequate 0.80 power.

Current Practice (20g homogenized from 15-lb lot):

- U_sampling = 78%
- U_homogenization = 65%
- U_analytical = 10%
- U_total = √(78² + 65² + 10²) = √(6,084 + 4,225 + 100) = √10,409 = 102.0%

Interpretation: When measurement uncertainty exceeds 50%, results are scientifically unreliable per ISO/IEC 17025. At 102%, the measurement is essentially meaningless.

Proper Practice (60g homogenized from 15-lb lot):

- U_sampling = 15%
- U_homogenization = 8%
- U_analytical = 10%
- U_total = √(15² + 8² + 10²) = √(225 + 64 + 100) = √389 = 19.7%

This is within acceptable limits for regulatory testing.

MATHEMATICAL APPENDIX

This appendix provides the fundamental mathematical formulas used throughout the analysis.

RSS Uncertainty Formula

$U_{total} = \sqrt{(U_{sampling}^2 + U_{homogenization}^2 + U_{analytical}^2)}$

Binomial Detection Probability

$P(detection) = 1 - (1 - p)^n$

Where p = proportion contaminated and n = effective sampling units.

Solving for n

$n = \ln(1 - P) / \ln(1 - p)$

Uncertainty to Reporting Range Conversion

Absolute uncertainty = (U/100) × True_Value

Standard uncertainty (k=1, ~68% confidence):

Measured_Value ± Absolute_uncertainty

Expanded uncertainty (k=2, ~95% confidence):

Measured_Value ± (2 × Absolute_uncertainty)

Example: For U_total = 102% at 20% THC: Range = -0.4% to 40.4%

References

Statistical and Methodological References

"7.5 Calculating the Sample Size for a Confidence Interval," Introduction to Statistics (2022). https://ecampusontario.pressbooks.pub/introstats/chapter/7-5-calculating-the-sample-size-for-a-confidence-interval/

"Sample Size Calculator," Calculator.net. https://www.calculator.net/sample-size-calculator.html

"6: Confidence Intervals and Sample Size," Statistics LibreTexts (2022). https://stats.libretexts.org/Bookshelves/Introductory_Statistics/Foundations_in_Statistical_Reasoning_(Kaslik)/06%3A_Confidence_Intervals_and_Sample_Size

"Binomial Distribution," Wikipedia (2024). https://en.wikipedia.org/wiki/Binomial_distribution

International Commission on Microbiological Specifications for Foods (ICMSF). (2011). "Microorganisms in Foods 8: Use of Data for Assessing Process Control and Product Acceptance." Springer. https://link.springer.com/book/10.1007/978-1-4419-9374-8

Joint Committee for Guides in Metrology (JCGM). (2008). "JCGM 100:2008 - Evaluation of measurement data --- Guide to the expression of uncertainty in measurement (GUM)." https://www.bipm.org/documents/20126/2071204/JCGM_100_2008_E.pdf

Gy, P.M. (1998). "Sampling for Analytical Purposes." John Wiley & Sons. ISBN: 978-0471979562

Danckwerts, P.V. (1952). "The Definition and Measurement of Some Characteristics of Mixtures." Applied Scientific Research, Section A, 3: 279-296. DOI: https://doi.org/10.1007/BF03184936

Magnusson, B., & Örnemark, U. (Eds.). (2014). "Eurachem Guide: The Fitness for Purpose of Analytical Methods -- A Laboratory Guide to Method Validation and Related Topics," 2nd ed. https://www.eurachem.org/images/stories/Guides/pdf/MV_guide_2nd_ed_EN.pdf

Standards and Regulatory References

International Organization for Standardization. (2017). "ISO/IEC 17025:2017 - General requirements for the competence of testing and calibration laboratories." https://www.iso.org/standard/66912.html

ASTM D8334/D8334M-20. (2020). "Standard Practice for Sampling of Cannabis/Hemp Post-Harvest Batches for Laboratory Analyses." ASTM International, West Conshohocken, PA. https://www.astm.org/d8334_d8334m-20.html

Sexton, M., & Ziskind, J. (2013). "Sampling Cannabis for Analytical Purposes," BOTEC Analysis Corp. I-502 Project #430, November 15, 2013. Washington State Liquor and Cannabis Board. https://lcb.wa.gov/sites/default/files/publications/Marijuana/BOTEC%20reports/Sampling-Final-Report-24-Nov-2013.pdf

European Pharmacopoeia Commission. (2008). "European Pharmacopoeia 9.0: Herbal drugs: sampling and sample preparation," 01/2008:20820. European Directorate for the Quality of Medicines & HealthCare. https://www.edqm.eu/en/european-pharmacopoeia-ph-eur-11th-edition

AOAC International. (2024). "Guidelines for Laboratories Performing Microbiological and Chemical Analyses of Food, Dietary Supplements, Pharmaceuticals, and Cannabis --- An Aid to the Interpretation of ISO/IEC 17025:2017." https://www.aoac.org/resources/guidelines-for-laboratories/

Nevada Legal References

Nevada Legislature. (2025). Senate Bill No. 157. 83rd Session. https://www.leg.state.nv.us/App/NELIS/REL/83rd2025/Bill/10036/Overview

Nevada Cannabis Compliance Board. (2024). "Proposed Changes to NCCR Regulation 11.050(3)." May 2024. https://ccb.nv.gov/laws-regulations/regulations/

2024 Nevada Revised Statutes Chapter 233B - Nevada Administrative Procedure Act NRS 233B.040. https://www.leg.state.nv.us/nrs/nrs-233b.html

Cannabis Compliance Board Meeting Minutes, September 19, 2024.

Sierra Cannabis Coalition Petition to Nevada Cannabis Compliance Board, October 28, 2022.

Cannabis Compliance Board. (2025). *Second Amended Notice of Intent to Act Upon Regulations: Notice of Hearing for the Adoption of NCCR 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 & 15*. State of Nevada. November 20, 2025 hearing notice. Available at https://ccb.nv.gov/public-meetings/

Cannabis Compliance Board. (2025). *LCB File No. R152-24: Proposed Permanent Regulation of the Cannabis Compliance Board* (revised October 1, 2025). State of Nevada Legislative Counsel Bureau. Available at https://www.leg.state.nv.us/

Cannabis Industry and Quality Control References

Sarma, N., Waye, A., ElSohly, M., et al. (2020). "Cannabis Inflorescence for Medical Purposes: USP Considerations for Quality Attributes," Journal of Natural Products. DOI: 10.1021/acs.jnatprod.9b01200

Montgomery, D.C. (2019). Statistical Methods for Quality Assurance: Applied Statistics and Probability for Engineers (6th Edition). Wiley. ISBN: 978-1119399308

Association of American Feed Control Officials (AAFCO). (2015). "GOOD Samples: Guidance on Obtaining Defensible Samples." https://www.aafco.org/publications/

WHO Expert Committee on Specifications for Pharmaceutical Preparations. (2020). "Fifty-fourth report." Geneva: World Health Organization; (WHO technical report series; no. 1025). Annex 4: Good Chromatography Practices. https://www.who.int/publications/i/item/9789240009881

OECD. (2018). "Series on Principles of Good Laboratory Practice (GLP) and Compliance Monitoring." Organisation for Economic Co-operation and Development. https://www.oecd.org/chemicalsafety/testing/oecdseriesonprinciplesofgoodlaboratorypracticeglpandcompliancemonitoring.htm

Constitutional Law References

Carter v. Carter Coal Co., 298 U.S. 238 (1936). United States Supreme Court.