How to Comply With the USDA's New Hemp Testing Rules With Ease

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The Journey of Hemp Legalization

- In 1937, hemp production was banned in the U.S. after the Marijuana Act was enacted.
- The Agricultural Act of 2014 reintroduced industrial hemp production in the U.S.
- U.S. industrial hemp acreage increased from 0 in 2013 to over 90,000 acres in 2018.
- The Agricultural Improvement Act of 2018 brought about significant changes in the agricultural sector.
- The U.S. Farm Bill was signed on December 20, 2018.

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The USDA's Final Rule

The USDA published the Final Rule that became effective from March 22, 2021.

Hemp testing labs need to get acquainted with these changes and be ready to implement them.

Several changes were introduced in the Final Rule that affects how hemp should be tested in the U.S.

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Why Hemp Testing Rules Are Important?

Legally Required in All 50 States

Penalties for Hot Hemp

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Total THC Limit

The THC threshold was maintained at 0.3% in the USDA's final rule

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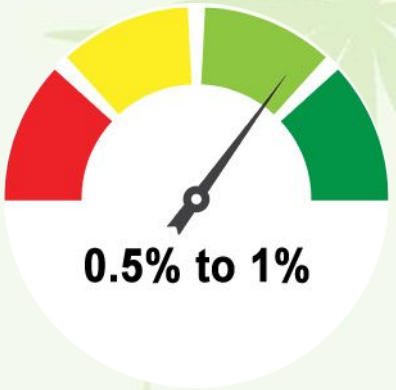
Negligent Violation

Hemp that tests above 0.3% THC but below 1 % THC can be remediated

This is not considered a violation of the law



This limit has been increased from 0.5% to 1%

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Operational Changes Introduced in the Final Rule

Hemp testing labs must use validated test methods

Labs should have appropriate quality assurance protocols in place

The USDA encourages hemp testing labs to be ISO/IEC 17025 accredited

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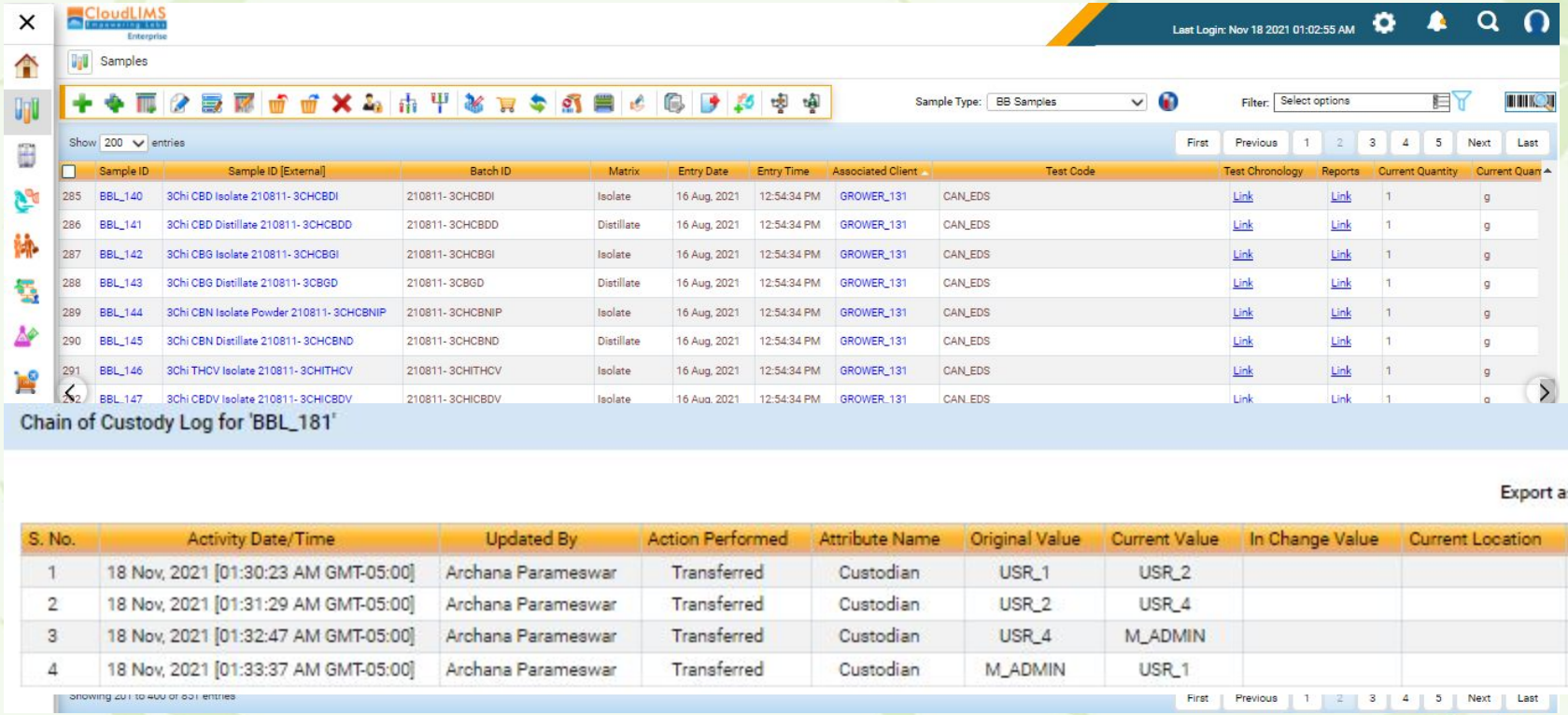
Manage Samples Through Their Lifecycle

Manage samples and maintain a chain of custody of all samples for complete traceability



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Reporting of Total THC

- THC must be reported as total THC “total THC on a dry weight basis”.
- Equals the total of delta-9 tetrahydrocannabinolic acid (THCA) and THC.

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Configure Formula Expressions

Configure formula expressions for calculation of total THC

View Existing Dependencies

32	Mapped Value & Replica	CBG~Result % From File	CBG~Result %	
33	Formula Expression		Total Cannabinoids~Result %	CBDVA~Result %+CBDV~Result %+CBDA~Result %+CBGA~Result %+CBG~Result %+CBD~Result %+THCV~Result %+THCVA~Result %+CBN~Result %+CBNA~Result %+D9-THC~Re
34	Formula Expression		Total CBG~Result %	CBGA~Result %*0.877+CBG~Result %
35	Formula Expression		CBGA~Result (mg/g)	CBGA~Result %*10
36	Formula Expression		CBL~Result (mg/g)	CBL~Result %*10
37	Formula Expression		CBN~Result (mg/g)	CBN~Result %*10
38	Formula Expression		CBNA~Result (mg/g)	CBNA~Result %*10
39	Formula Expression		D8-THC~Result (mg/g)	D8-THC~Result %*10
40	Formula Expression		CBC~Result (mg/g)	CBC~Result %*10
41	Formula Expression		Total THC~Result %	THCA~Result %*0.877+D9-THC~Result %
42	Formula Expression		D9-THC~Result (mg/g)	D9-THC~Result %*10
43	Formula Expression		THCA~Result (mg/g)	THCA~Result %*10
44	Formula Expression		THCV~Result (mg/g)	THCV~Result %*10
45	Formula Expression		THCVA~Result (mg/g)	THCVA~Result %*10
46	Formula Expression & Replica	THCA~Result %	Total THC~Result %	
47	Replica	Total THC~Result %	Total THC~Flag Based on this column	
48	Formula Expression & Replica	CBDA~Result %	Total CBD~Result %	
49	Formula Expression & Replica	CBDVA~Result %	Total Cannabinoids~Result %	
50	Formula Expression & Replica	CBGA~Result %	Total CBG~Result %	
51	Formula Expression		CBCA~Result (mg/g)	CBCA~Result %*10
52	Formula Expression		Total CBD~Result %	CBDA~Result %*0.877+CBD~Result %
53	Formula Expression		CBD~Result (mg/g)	CBD~Result %*10
54	Formula Expression		CBDA~Result (mg/g)	CBDA~Result %*10
55	Formula Expression		CBDV~Result (mg/g)	CBDV~Result %*10
56	Formula Expression		CBDVA~Result (mg/g)	CBDVA~Result %*10
57	Formula Expression		CBG~Result (mg/g)	CBG~Result %*10
58	Formula Expression & Replica	CBGA~Result %	CBGA~Result (mg/g)	
59	Formula Expression		Total Cannabinoids~Result (mg/g)	CBDVA~Result (mg/g)+CBDV~Result (mg/g)+CBDA~Result (mg/g)+CBGA~Result (mg/g)+CBG~Result (mg/g)+CBD~Result (mg/g)+THCV~Result (mg/g)+THCVA~Result (mg/g)+CB
60	Formula Expression		Total CBG~Result (mg/g)	CBGA~Result (mg/g)*0.877+CBG~Result (mg/g)
61	Formula Expression & Replica	CBL~Result %	CBL~Result (mg/g)	
62	Formula Expression & Replica	CBN~Result %	CBN~Result (mg/g)	

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Flag Out-of-Specification Results

Flag hemp that tests more than 0.3% THC

#	Analytes	LOD (PPM)	LOQ (PPM)	Result %	Result (mg/g)	Flag	Minimum	Maximum
1	Cannabidivarinic acid (CBDVa)	0.02	0.05	0.0887	0.89			
2	Cannabidivarin (CBDV)	0.03	0.1	0.161	1.61			
3	Cannabidiolic acid (CBDa)	0.03	0.08	11.1199	111.2			
4	Cannabigerolic acid (CBGa)	0.03	0.08	0.2036	2.04			
5	Cannabigerol (CBG)	0.05	0.16	0.0533	0.53			
6	Cannabidiol (CBD)	0.06	0.17	1.2897	12.9			
7	Tetrahydrocannabivarin (THCV)	0.06	0.17	ND	ND			
8	Tetrahydrocannabivarinic acid (T	0.05	0.15	ND	ND			
9	Cannabinol (CBN)	0.03	0.1	ND	ND			
10	Cannabinolic acid (CBNa)	0.08	0.26	<LoQ	<LoQ			
11	D9-Tetrahydrocannabinol (D9-TH	0.12	0.36	0.1405	1.4			
12	D8-Tetrahydrocannabinol (D8-TH	0.15	0.45	ND	ND			
13	Cannabicyclol (CBL)	0.13	0.38	<LoQ	<LoQ			
14	D9-Tetrahydrocannabinolic acid	0.09	0.28	0.4017	4.02			
15	Cannabichromene (CBC)	0.06	0.19	0.1532	1.53			
16	Cannabichromenic acid (CBCa)	0.22	0.67	0.6013	6.01			
17	Total THC (THCa * 0.877 + THC)			0.49	4.93	Compliance Fail		0.3
18	Total CBD (CBDa * 0.877 + CBD)			11.04	110.42			
19	Total CBG (CBGa * 0.877 + CBG)			0.23	2.32			
20	Total Cannabinoids			14.21	142.13			

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Manage QC Samples & Their Test Results

Manage quality control samples and monitor their results to detect anomalies

- Blanks
- Spikes
- Duplicate

Result Entries

Flagging Sets :

Test Results For Sample ID: QC_Sample_1

Result Entry Completed [Check this to notify other users.]

Update Quantity to be Deducted 0 Total Consumed 0 ml Current Quantity: 0 ml

Test Analyte Runs

Test Runs: QC Sample Analyte Template QC_Hemp Freeze: Analyte Name

#	Analyte Group	Analyte Name *	Analytes	LOD (PPM)	LOQ (PPM)	F
1	cannabinoids	CBDVA	Cannabidivarinic acid (CBDVa)	0.02	0.05	144
2	cannabinoids	CBDV	Cannabidivarin (CBDV)	0.03	0.1	
3	cannabinoids	CBDA	Cannabidiolic acid (CBDa)	0.03	0.08	
4	cannabinoids	CBGA	Cannabigerolic acid (CBGa)	0.03	0.08	
5	cannabinoids	CBG	Cannabigerol (CBG)	0.05	0.16	
6	cannabinoids	CBD	Cannabidiol (CBD)	0.06	0.17	
7	cannabinoids	THCV	Tetrahydrocannabivarin (THCV)	0.06	0.17	
8	cannabinoids	THCVA	Tetrahydrocannabivarinic acid (T	0.05	0.15	
9	cannabinoids	CBN	Cannabinol (CBN)	0.03	0.1	

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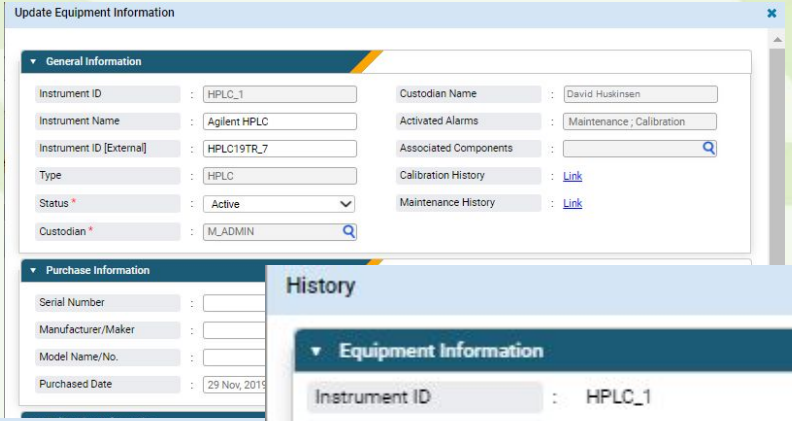
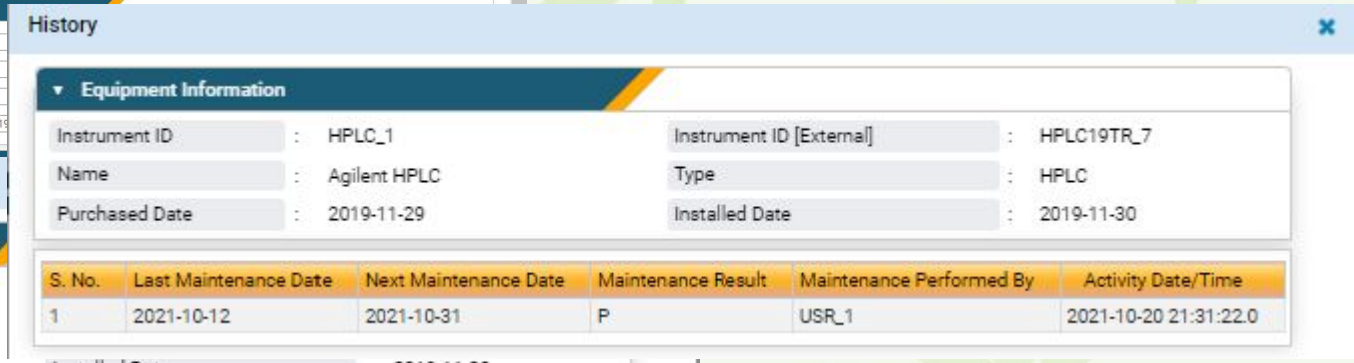
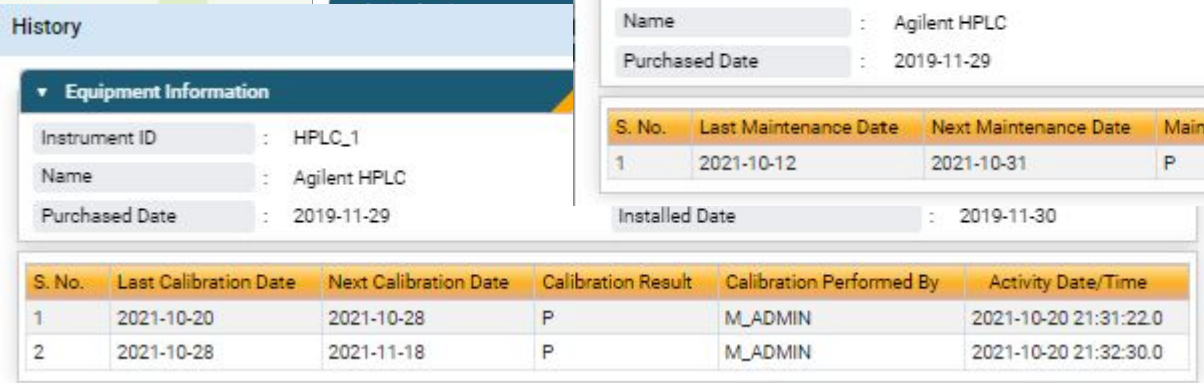
Instrument: Calibration and Maintenance

Schedule instrument calibration, manage maintenance data, & assign instrument handling to staff based on their competency







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Personnel: Staff Training & Competency

Schedule Staff Training and Manage Their Competency

	Training ID	Title	Type	Venue	Trainer	Custodian	Associated User/Staff	View Competency	Training Start Date	Training End Date	Tr
1	TRNG_4	Staff Safety	Demo	Lab A	James Smith	M_ADMIN	M_ADMIN , USR_1 , USR_2	Link	01 Feb, 2022	04 Feb, 2022	Con
2	TRNG_3	Waste Management	Demo	Meeting Hall	William Smith	M_ADMIN	USR_1 , USR_2 , USR_3	Link	08 Feb, 2021	12 Feb, 2021	Con
3	TRNG_2	Equipment Calibration & Handling	Demo	Training Hall	Kerry Jones	M_ADMIN	USR_1 , USR_2	Link	01 Apr, 2022	05 Apr, 2022	Con

	A	B	C	D	E	F	G
1		M_ADMIN	Aaron Townsend	John Smith	Adam Lallana	Joe Gomez	John Smith
2	Staff Safety	5	4	0	3	4	1
3	Equipment Calibration	0	0	0	0	0	0
4	Waste Management	4	4	0	3		

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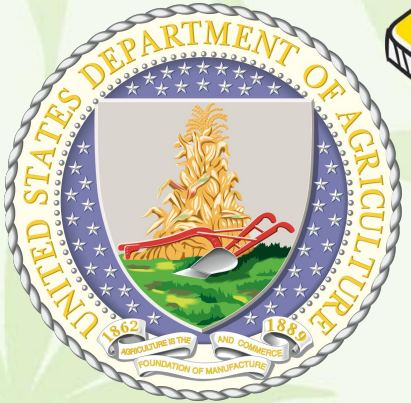
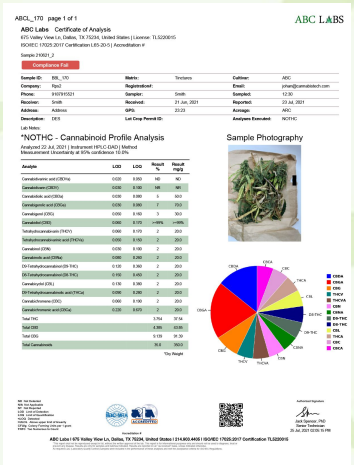
DEA Registration & Sharing of Test Results



Appropriate State Department of Agriculture or Tribe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ABC LABS

ABC Labs Certificate of Analysis

675 Valley View Ln, Dallas, TX 75234, United States | License: TL5200005

ISO/IEC 17025:2017 Certification LES-20-1 | Accreditation #

Sample 210021_2

Compliance Fail

Sample ID:	BBL_120	Matrix:	Tinctures	Cultivar:	ABC
Company:	Ripe2	Registered#:		Email:	ryhan@cannalabstech.com
Phone:	9107915521	Sampler:	Smith	Sampled:	12:30
Received:	Smith	Received:	21 Jun, 2021	Reported:	23 Jul, 2021
Address:	Address	GPS:	22/23	Acreage:	ABC
Description:	DES	Lot Crop Permit ID:		Analyses Executed:	%OTHC

Lab Notes:

*NOTHC - Cannabinoid Profile Analysis

Analyzed 22 Jul, 2021 | Instrument HPLC-DAD | Method

Measurement Uncertainty at 95% confidence +0.2%

Analyte	LOD	LOQ	Result %	Result mg/g
Cannabidivarinic acid (CBDVa)	0.020	0.060	ND	ND
Cannabivarin (CBDV)	0.030	0.130	ND	ND
Cannabidiolic acid (CBDa)	0.030	0.080	5	50.0
Cannabigerolic acid (CBGa)	0.030	0.080	7	70.0
Cannabigerol (CBG)	0.050	0.160	3	30.0
Cannabidiol (CBD)	0.060	0.170	>99%	>=99%
Tetrahydrocannabivarin (THCV)	0.060	0.170	2	20.0
Tetrahydrocannabivarinic acid (THCVa)	0.050	0.150	2	20.0
Cannabinol (CBN)	0.030	0.160	2	20.0
Cannabinolic acid (CBNa)	0.080	0.240	2	20.0
Δ9-Tetrahydrocannabinol (Δ9-THC)	0.130	0.360	2	20.0
Δ9-Tetrahydrocannabinolic (Δ9-THCa)	0.150	0.420	2	20.0
Cannabicyclol (CBL)	0.130	0.360	2	20.0
Δ8-Tetrahydrocannabinolic acid (Δ8-THCa)	0.090	0.260	2	20.0
Cannabichromene (CBC)	0.060	0.180	2	20.0
Cannabichromenic acid (CBCa)	0.330	0.970	2	20.0
Total THC			3.764	37.64
Total CBD			4.396	43.96
Total CBG			5.139	34.26
Total Cannabinoids			16.8	166.0

*Dry Weight

Sample Photography

ABC Labs | 675 Valley View Ln, Dallas, TX 75234, United States | 214.800.4458 | ISO/IEC 17025:2017 Certification TL5200005

Test Results

The USDA

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How to Choose the Right LIMS for Your Lab

Here's a Checklist of Essential Functionality:

- ✓ Integrate with the reporting system of the USDA & the state department of agriculture
- ✓ Streamline and automate QA/QC processes
- ✓ Generate custom Certificates of Analysis (CoA)
- ✓ Manage staff training and their competency
- ✓ Manage documents, SOPs, and track their version history
- ✓ Schedule instrument calibration & manage maintenance data
- ✓ Maintain a chain of custody of all samples through their lifecycle

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Thank You For Your Attention!

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