ADVANCED ANALYTICAL RESEARCH
2517 Advance Rd, Ste A
Madison WI 53718
www.aarlab.com

HOP CERTIFICATE OF ANALYSIS

Customer : Wisconsin Hop Exchange Growers Cooperative

Sample ID: 20MIC1087-01LH

Variety: Michigan Copper

Certifying Officer: Zach Lilla - Lab Manager
TTB Certified Chemist - Member AOAC - ASBC - BJCP

Date : 1/25/2021

Method				
Hops-4C	Moisture Analysis	% Moisture	9.2	
		% Dry Matter	90.8	
Hops-6A	Alpha and Beta Acids by SPEC	**% Alpha Acids**	**NT**	
		% Beta Acids	**NT**	
		a/b ratio	NT	
Hops-12	Hop Storage Index	HSI	0.291	
Hops-13	Essential Oil by Steam Distillation	**mL/100g**	**1.78**	
Hops-14 ICE-3	Alpha and Beta Acids by HPLC	Cohumulone	29.8	(% of Total AA)
		% Alpha Acids	**10.07**	
		Colupulone	55.2	(% of Total BA)
		% Beta Acids	**3.14**	
		a/b ratio	3.21	

		% area	mg/100g
Hops-17	Hop Essential Oil by GC-FID (as is)	B-Pinene	NT	NT
		Myrcene	NT	NT
		Linalool	NT	NT
		Caryophyllene	NT	NT
		Farnesene	NT	NT
		Humulene	NT	NT
		Geraniol	NT	NT

NT=NOT TESTED

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist

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HOP QUALITY REPORT

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		Typical Range	
% Moisture	9.2	8 - 12%	✓
Total Oil ml/100g @ 10%	1.76	1.2 - 1.8 ml	✓
cohumulone	29.8	27 - 32%	✓
Alpha Acids @ 10%	9.98	9.0 - 13%	✓
Beta Acids @ 10%	3.11	2.0 - 3.0%	↑

AROMA QUALITY (AQ)

	% Area		
B-Pinene	NT	0.40 - 1.00 %	NT
Myrcene	NT	28.00 - 38.00 %	NT
Linalool	NT	0.6 - 1.20 %	NT
Caryophyllene	NT	9.00 - 12.00 %	NT
Farnesene	NT	0.01 - 1.00 %	NT
Humulene	NT	17.00 - 23.00 %	NT
Geraniol	NT	0.60 - 1.00 %	NT
	mg/mL		
B-Pinene	NT	4 - 10	NT
Myrcene	NT	280 - 380	NT
Linalool	NT	6 - 12	NT
Caryophyllene	NT	90 - 120	NT
Farnesene	NT	0.1 - 10	NT
Humulene	NT	170 - 230	NT
Geraniol	NT	6 - 10	NT
	mg/100g @ 10% Moisture		
B-Pinene	NT	4.8 - 18	NT
Myrcene	NT	336 - 684	NT
Linalool	NT	7.2 - 21.6	NT
Caryophyllene	NT	108 - 216	NT
Farnesene	NT	0.12 - 18	NT
Humulene	NT	204 - 414	NT
Geraniol	NT	7.2 - 18	NT

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist