

HOP QUALITY REPORT CERTIFICATE OF ANALYSIS

To: Wisconsin Hop Exchange

Sample ID: 22VOJ1100-01LH

Variety: Vojvodina Whole Cone

Date : 2/21/2023 Pellet



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

| <u>Method</u> | | | |
|---------------|--|----------------------|----------------------|
| Hops-4C | Moisture Analysis | % Moisture | 10.0 |
| | | % Dry Matter | 90.0 |
| AAR | Xanthohumol by HPLC | | NT mg/g |
| Hops-12 | Hop Storage Index | HSI | 0.295 |
| Hops-13 | Essential Oil by Steam Distillation | mL/100g | 0.90 |
| Hops-14 | Alpha and Beta Acids by HPLC | Cohumulone | 27.1 (% of Total AA) |
| ICE-3 | | % Alpha Acids | 6.56 |
| | | Colupulone | 47.3 (% of Total BA) |
| | | % Beta Acids | 4.71 |
| | | a/b ratio | 1.39 |
| Hops-17 | Hop Essential Oil by GC-FID (as is) | % area | mg/100g |
| | | B-Pinene | NT |
| | | Myrcene | NT |
| | | Linalool | NT |
| | | Caryophyllene | NT |
| | | Farnesene | NT |
| | | Humulene | NT |
| | | Geraniol | NT |

NT=NOT TESTED

Signed:

Zachary Lilla - Lab Manager - TTB Certified Chemist
 AAR LAB - ADVANCED ANALYTICAL RESEARCH
 2517 Advance Rd Ste. A Madison WI 53718



AROMA QUALITY (AQ) HOP QUALITY REPORT



Customer : Wisconsin Hop Exchange

Sample ID: 22VOJ1100-01LH

Variety: Vojvodina

Whole Cone

Pellet

Date : 2/21/2023

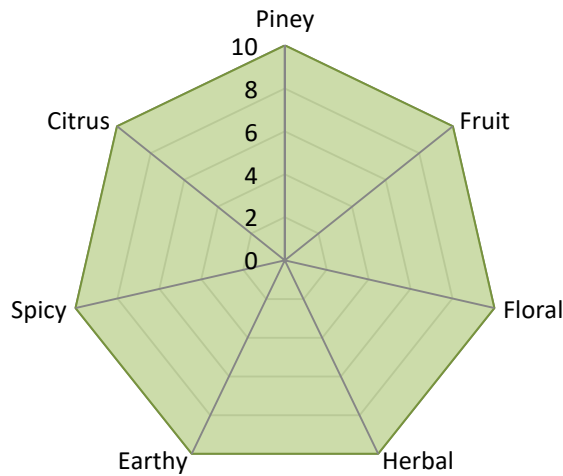
Certifying Officer: Zach Lilla - Lab Manager
TTB Certified Chemist - Member AOAC - ASBC - BJCP

| | | | | |
|---|------|---------------|--------------|-------------------------------------|
| % Moisture | 10.0 | Typical Range | 8 - 12% | <input checked="" type="checkbox"/> |
| HOP QUALITY (adjusted to 10% moisture) | | | | |
| Total Oil ml/100g | 0.90 | | 0.6 - 1.4 mL | <input checked="" type="checkbox"/> |
| cohumulone | 27.1 | | 28 - 32% | <input type="checkbox"/> |
| Alpha Acids | 6.56 | | 6.0 - 10.5% | <input checked="" type="checkbox"/> |
| Beta Acids | 4.71 | | 2.2 - 4.8% | <input checked="" type="checkbox"/> |

AROMA QUALITY (AQ)

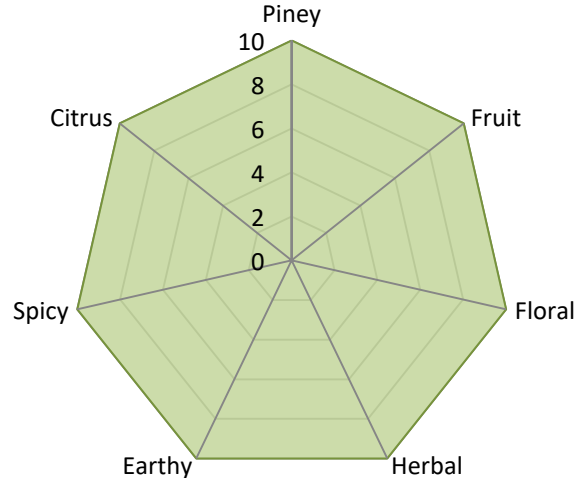
| | % Area | | mg/mL of Hop Oil | | mg/100g of Hops (@10%H2O) | |
|---------------|--------|-----------------|------------------|-----------|---------------------------|-----------|
| B-Pinene | NT | 0.40 - 1.00 % | NT | 4 - 10 | NT | 2.4 - 14 |
| Myrcene | NT | 60.00 - 70.00 % | NT | 600 - 700 | NT | 360 - 980 |
| Linalool | NT | 0.50 - 1.00 % | NT | 5 - 10 | NT | 3 - 14 |
| Caryophyllene | NT | 4.00 - 6.00 % | NT | 40 - 60 | NT | 24 - 84 |
| Farnesene | NT | 0.01 - 1.00 % | NT | 0.1 - 10 | NT | 0.06 - 14 |
| Humulene | NT | 10.00 - 14.00 % | NT | 100 - 140 | NT | 60 - 196 |
| Geraniol | NT | 0.40 - 1.00 % | NT | 4 - 10 | NT | 2.4 - 14 |

AQ vs VARIETY SPECS



Aroma Intensity= 100

AQ vs ALL HOP VARIETIES



Aroma Intensity= 100

Signed:
Zachary Lilla - Lab Manager - TTB Certified Chemist

