

BEER-4

*American Society of Brewing Chemists*  
**BEER CHECK SERVICE**

12/31/2016

| Sub # | Specific Gravity | Alcohol   | Real Extract | Color    | Bitterness Units | Protein | Reducing Sugars | Iron    | Refractive Index | Copper  | Diacetyl  | Total Acidity |
|-------|------------------|-----------|--------------|----------|------------------|---------|-----------------|---------|------------------|---------|-----------|---------------|
| 18    | 1.01171 AX       | 4.73 BX   | 5.15 CX      | 10.62 D1 | 51.00 E1         |         |                 |         |                  |         |           |               |
| 64    | 1.01170 A2       | 4.69 B3   | 5.10 C3      |          |                  | 0.72 F1 |                 |         |                  |         |           | 0.29 L1       |
| 83    |                  |           |              |          |                  |         |                 | 0.04 H2 |                  |         |           |               |
| 133   | 1.01169 A2       | 4.65 B5   | 5.12 CX      | 8.85 DX  | 43.19 E1         |         |                 |         |                  |         |           |               |
| 138   | 1.01176 A2       | 4.77 B5   | 5.18 CX      | 10.20 D1 | 48.40 E1         |         |                 | 0.03 HX |                  | 0.04 JX | 26.000 K1 |               |
| 143   | 1.01170 A2       |           |              | 9.16 D1  | 39.00 E1         |         |                 |         |                  |         |           | 0.24 L1       |
| 144   | 1.01183 AX       | 4.76 BX   | 5.20 CX      | 10.20 DX | 41.00 EX         |         |                 |         |                  |         | 24.000 KX |               |
| 150   | 1.01180 A2       | 4.67 B5   | 5.15 CX      | 10.39 D1 | 48.25 E1         |         |                 |         |                  |         | 35.000 KX |               |
| 153   | * 1.01290 AX     | 4.90 BX   |              | 10.50 D1 | 53.05 E1         |         |                 |         |                  |         |           |               |
| 155   | 1.01160 AX       | 4.60 B5   |              | 11.00 D1 | 46.40 E1         |         |                 |         |                  |         |           |               |
| 157   | 1.01179 A2       | 4.73 B5   |              | 10.87 D1 | 49.10 E1         |         |                 |         |                  |         |           |               |
| 165   | 1.01176 AX       | 4.76 BX   | 5.18 CX      | 10.32 DX | 41.75 EX         |         |                 |         |                  |         | 57.000 KX | * 3.63 LX     |
| 169   | 1.01190 A2       | 4.61 B5 * | 4.15 CX      | 10.10 D1 | 54.00 E1         | 0.75 FX | 1.69 G2         | 0.01 H2 |                  | 0.03 J1 | 17.800 K1 | 0.23 L1       |
| 170   | 1.01187 A2       | 4.80 B5 * | 5.33 C1      | 10.10 D1 | 47.20 E1         |         | 0.00 *          | 0.91    |                  | 0.04    |           |               |
| 171   | 1.01165 A2       | * 6.06 BX |              | 10.48 D1 | 42.70 E1         |         |                 |         |                  |         |           |               |
| 190   | 1.01170 A2       | 4.70 BX   | 5.14 CX      | 10.50 D1 | 44.40 E1         |         |                 |         |                  |         | 10.700 KX |               |
| 193   | 1.01157 A2       | 4.76 B5   | 5.13 C3      | 11.20 D1 | 37.20 E1         |         |                 |         |                  |         |           |               |
| 196   | 1.01171 A1       | 4.60 B2   |              | 10.36 D1 | 50.96 E1         |         |                 |         |                  |         | 14.000 KX |               |
| 198   | 1.01170 A2       | 4.84 B5   |              | 10.40 D1 | 54.00 E1         |         |                 |         |                  |         |           |               |
| 201   | 1.01180 A2       | 4.72 BX   | 5.21 CX      | 10.50 D1 | 43.00 E1         |         |                 | 0.03 HX |                  | 0.03 JX |           | 0.33 L1       |
| 205   | 1.01157 A2       | 4.79 B5   |              | 9.50 D1  | 39.70 E1         |         |                 |         |                  |         |           |               |
| 206   | * 1.01007 AX     | 4.75 BX   | 5.21 CX      | 10.52 DX | 47.55 EX         |         |                 |         |                  |         | 33.170 KX |               |
| 209   | 1.01240 A2       | 4.80 B5   |              | 9.60 D1  | 50.00 E1         |         |                 |         |                  |         |           |               |
| 215   | 1.01164 A2       | 4.83 B5   | 5.13 CX      | 9.76 D1  | 49.23 E1         |         |                 |         |                  |         |           |               |
| 220   |                  | 4.95 B5   |              |          |                  |         |                 |         |                  |         |           |               |

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| <i>Sub #</i> | <i>Specific Gravity</i> | <i>Alcohol</i> | <i>Real Extract</i> | <i>Color</i> | <i>Bitterness Units</i> | <i>Protein</i> | <i>Reducing Sugars</i> | <i>Iron</i> | <i>Refractive Index</i> | <i>Copper</i> | <i>Diacetyl</i> | <i>Total Acidity</i> |
|--------------|-------------------------|----------------|---------------------|--------------|-------------------------|----------------|------------------------|-------------|-------------------------|---------------|-----------------|----------------------|
| N            | 21                      | 22             | 12                  | 22           | 22                      | 2              | 2                      | 4           |                         | 4             | 8               | 4                    |
| Mean         | 1.01175                 | 4.75           | 5.16                | 10.23        | 46.41                   | 0.74           | 0.845                  | 0.025       |                         | 0.03          | 27.209          | 0.27                 |
| Min          | 1.01157                 | 4.60           | 5.10                | 8.85         | 37.20                   | 0.72           | 0.000                  | 0.01        |                         | 0.03          | 10.700          | 0.23                 |
| Max          | 1.01240                 | 4.95           | 5.21                | 11.20        | 54.00                   | 0.75           | 1.690                  | 0.04        |                         | 0.04          | 57.000          | 0.33                 |
| Std          | 0.00016                 | 0.09           | 0.04                | 0.57         | 4.95                    | 0.02           | 1.20                   | 0.01        |                         | 0.00          | 14.789          | 0.05                 |

*\* Not Included in Mean*

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| <i>Sub #</i> | <i>Calcium</i> | <i>Sodium</i> | <i>pH</i> | <i>Chloride</i> | <i>Foam<br/>Collapse<br/>Rate</i> | <i>SO2</i> | <i>Sulfate</i> | <i>Yeast<br/>Fermentable<br/>Extract</i> | <i>Air</i> | <i>CO2 Volume</i> | <i>Ash</i> |
|--------------|----------------|---------------|-----------|-----------------|-----------------------------------|------------|----------------|------------------------------------------|------------|-------------------|------------|
| N            | 4              | 5             | 21        |                 | 5                                 | 3          |                |                                          | 5          | 14                | 2          |
| Mean         | 127.65         | 32.7          | 4.37      |                 | 272                               | 0.29       |                |                                          | 0.36       | 2.58              | 0.17       |
| Min          | 123.00         | 12.0          | 4.22      |                 | 111                               | 0.16       |                |                                          | 0.15       | 2.50              | 0.08       |
| Max          | 138.00         | 64.0          | 4.56      |                 | 487                               | 0.50       |                |                                          | 0.60       | 2.65              | 0.26       |
| Std          | 7.02           | 19.1          | 0.09      |                 | 138                               | 0.19       |                |                                          | 0.18       | 0.05              | 0.13       |

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| <i>Sub #</i> | <i>Apparent<br/>Extract</i> | <i>Total<br/>VDK</i> | <i>Pentanedione</i> | <i>Free<br/>Amino<br/>Nitrogen</i> | <i>Viscosity</i> | <i>Dimethyl<br/>Sulfide</i> | <i>Total<br/>Haze</i> | <i>Extract of<br/>Orig. Wort</i> | <i>Iso-Alpha<br/>Acids for<br/>Beer</i> |
|--------------|-----------------------------|----------------------|---------------------|------------------------------------|------------------|-----------------------------|-----------------------|----------------------------------|-----------------------------------------|
| N            | 13                          | 6                    | 5                   | 2                                  |                  |                             | 8                     | 11                               |                                         |
| Mean         | 3.01                        | 0.06                 | 0.007               | 167.50                             |                  |                             | 221.00                | 14.23                            |                                         |
| Min          | 2.96                        | 0.02                 | 0.001               | 159.00                             |                  |                             | 26.28                 | 13.98                            |                                         |
| Max          | 3.05                        | 0.11                 | 0.011               | 176.00                             |                  |                             | 473.20                | 14.51                            |                                         |
| Std          | 0.02                        | 0.03                 | 0.005               | 12.02                              |                  |                             | 168.07                | 0.14                             |                                         |

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