

CERTIFICATE OF ANALYSIS

| | | | |
|---------------------------|----------------|------------------------------|-------------|
| SAMPLE NAME | | Peppermint oil BP Piperita | |
| FORM | | Oil | |
| CUSTOMER NAME | | Buckley & Phillips Aromatics | |
| CERTIFICATION DATE | | 22 March 2019 | |
| CUSTOMER REFERENCE | | 18573 | |
| ARL JOB # | A190548 | LAB REF. # | ARL1901301 |
| ANALYSIS | GCFID - Area % | METHOD | ARL-TM101-3 |

| TEST | BP 2018 SPECIFICATION | RESULTS | TEST METHOD |
|-----------------|-----------------------|---------|--------------|
| | Area % | | |
| limonene | 1.0 - 3.5 | 1.97 | ARL-TM101-3* |
| 1,8 cineole | 3.5 - 8.0 | 3.85 | |
| menthofuran | 1.0 - 8.0 | 2.41 | |
| isopulegol | ≤ 0.2 | 0.12 | |
| menthone | 14.0 - 32.0 | 23.05 | |
| isomenthone | 1.5 - 10.0 | 3.59 | |
| menthol | 30.0 - 55.0 | 44.45 | |
| pulegone | ≤ 3.0 | 1.06 | |
| menthyl acetate | 2.8 - 10.0 | 5.22 | |
| carvone | ≤ 1.0 | 0.23 | |

* Assay by GC (FID detection –area percent report)



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Samantha Morrow
ANALYTICAL OFFICER



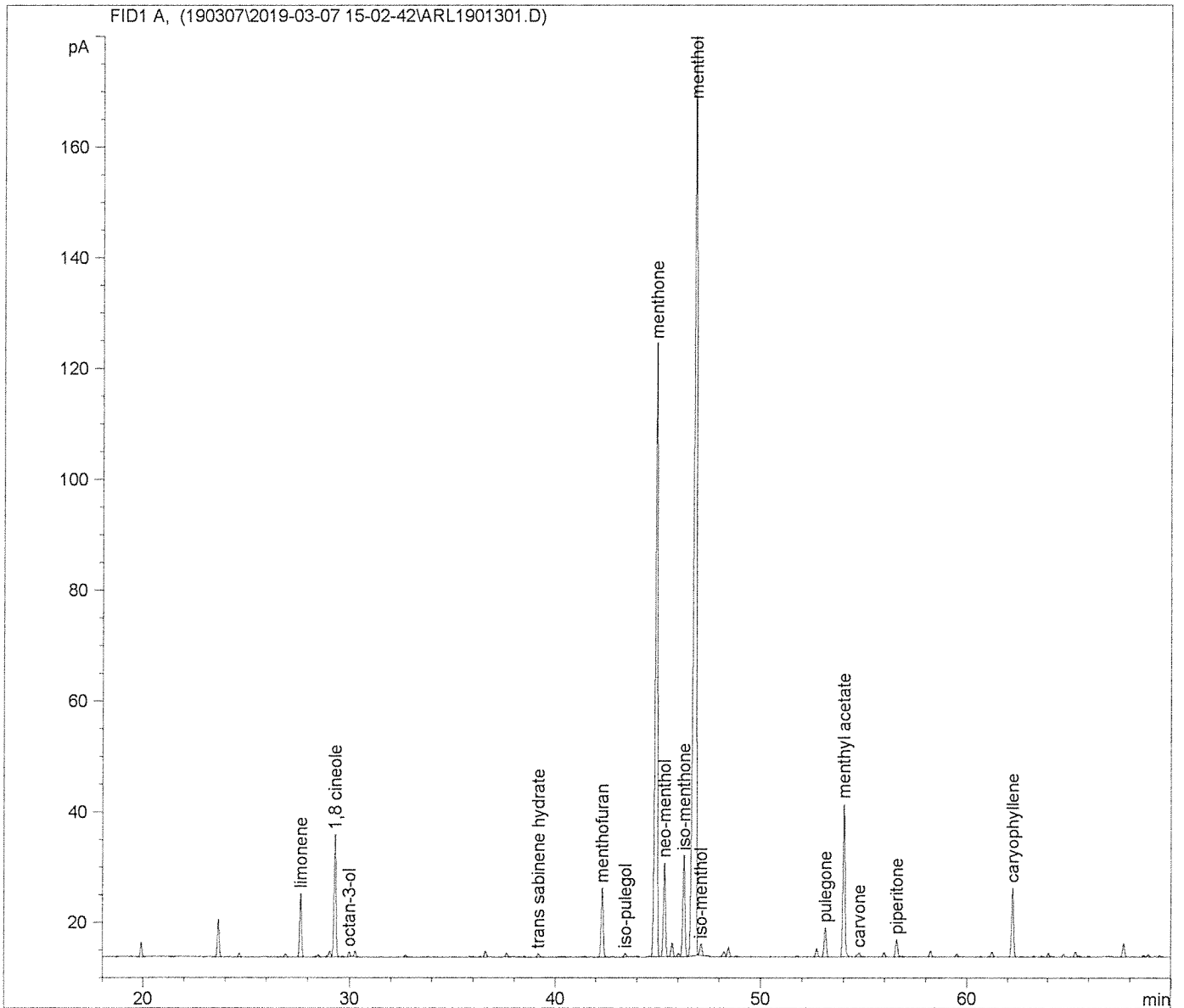
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Ashley Dowell
MANAGER - ARL

Sample Name: Peppermint 18573

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Acq. Operator   : Jeanette Balindong           Seq. Line :    3
Acq. Instrument : GC-5                       Location  : Vial 10
Injection Date  : 3/7/2019 6:15:07 PM        Inj       :    1
                                           Inj Volume: 1 µl

Acq. Method    : C:\DATA\GC-5\DATA\190307\2019-03-07 15-02-42\PEPPERMINT.M
Last changed   : 2/1/2019 11:51:36 AM by Jeanette Balindong
Analysis Method : C:\DATA\GC-5\METHODS\PEPPERMINT.M
Last changed   : 2/1/2019 11:51:36 AM by Jeanette Balindong
Method Info    : Method to analyse essential oil
    
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Handwritten: 4/3
19/3/19

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Area Percent Report
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Sorted By : Signal
Calib. Data Modified : 11/1/2018 10:13:46 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

| Peak # | RetTime [min] | Type | Width [min] | Area [pA*s] | Area % | Name |
|--------|---------------|------|-------------|-------------|----------|------------------------|
| 1 | 27.646 | BB | 0.0954 | 72.90125 | 1.96553 | limonene |
| 2 | 29.290 | VB | 0.0922 | 142.86740 | 3.85193 | 1,8 cineole |
| 3 | 29.970 | BB | 0.0884 | 5.67692 | 0.15306 | octan-3-ol |
| 4 | 39.170 | BB | 0.0829 | 4.29102 | 0.11569 | trans sabinene hydrate |
| 5 | 42.296 | BB | 0.0992 | 89.54527 | 2.41428 | menthofuran |
| 6 | 43.426 | BV | 0.0972 | 4.51509 | 0.12173 | iso-pulegol |
| 7 | 44.924 | BB | 0.1032 | 855.03448 | 23.05307 | menthone |
| 8 | 45.325 | BB | 0.0925 | 116.39173 | 3.13810 | neo-menthol |
| 9 | 46.273 | VB | 0.0988 | 133.29033 | 3.59372 | iso-menthone |
| 10 | 46.827 | BB | 0.1232 | 1648.59717 | 44.44877 | menthol |
| 11 | 47.102 | BB | 0.0983 | 16.05162 | 0.43278 | iso-menthol |
| 12 | 53.123 | BB | 0.0976 | 39.25668 | 1.05842 | pulegone |
| 13 | 54.017 | BB | 0.0894 | 193.78273 | 5.22469 | menthyl acetate |
| 14 | 54.747 | BB | 0.1308 | 8.50660 | 0.22935 | carvone |
| 15 | 56.565 | BV | 0.0996 | 24.02320 | 0.64770 | piperitone |
| 16 | 62.244 | BB | 0.0917 | 90.98320 | 2.45305 | caryophyllene |

Totals : 3445.71469 92.9019

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*** End of Report ***

843
12/3/19