MLG-50 Liquid Fulvic Concentrate

Item Number: HHD30FA104

Validation of Content

This document contains laboratory reports that reveal the diversity of ingredients found in MLG-50 Liquid Fulvic Concentrate. The information herein is a typical example of what our product contains in each batch we manufacture. The number of organic acids including amino acids and fulvic acid are validation of the products organic origin.

Fulvic acid content is verified by the standardized AOAC Vol, 97 Lamar method of Fulvic Acid quantification.

All products are manufactured in our cGMP certified facility: Issued by: UL/NPA (Underwriter's Labs / Natural Products Association) Conformance to: 21 CFR Part 111: 4-2016 Certificate Number: m18-299368-1

Issued: Nov 13, 2018 / Expires: Nov 13 2021

CONTENTS:

Microbial Profiles Mineral Analytes Heavy Metals Amino Acid Profile Organic Acid Profile Fulvic Acid Content

ANALYTICAL LABORATORIES:

Advanced Laboratories Motzz Laboratories Atlas Bio-Science laboratories

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IAS Laboratories

2515 East University Drive Phoenix, Arizona 85034 (602) 273-7248 Fax (602) 275-3836 Date Received: Work Order: January 31, 2020

20A0148

Submitted By:

Report To:

Ralf Ostertag Mineral Logic LLC

Project:

Fulvic (AOAC)

Sample Results

Sample Name:

MLG-50 Fulvic Minerals-HHD30FA104; Batch: 20009

IAS Lab ID:

20A0148-01 (Other)

	Result	MRL	Units	Method	
Organic Acids					
Fulvic Acid	4.71	<0.01	%	IHSS/Lamar/AOAC	

MRL: Minimum Reporting Limit

ND: None Detected



40 West Louise Ave., Salt Lake City, UT 84115 Phone: (801) 485-1800 Fax: (801) 484-9211

Email: utlab@advancedlabsinc.com FDA Registration #14353128308

Test Certificate

Description:

Fulvic Minerals - HHD30FA104

Sample ID:

Batch Number: 20009

Lot No:

Location: Received:

1/31/2020

Completed:

2/12/2020

Client: Ralf Ostertag

Mineral Logic LLC 7136 East "N" Avenue

Kalamazoo, Michigan 49048

Lab No: 187770-01

Analysis	Result	Per Unit	Specifications	Method
				ICP-OES USP
Aluminum	1,761	ppm	< 2,500 ppm	<730>
Appearance	Black liquid		Dark Amber Liquid	Visual
Calcium	593	ppm	< 6,500 ppm	ICP-OES USP <730>
Carbon	43,100	ppm	10,000 - 50,000 ppm	ASTM D-1552
Mercury	< 0.001	ppm	< 0.1 ppm	ICP-MS USP <730>
Lead	0.005	ppm	< 2 ppm	ICP-MS USP <730>
Arsenic	5.554	ppm	< 10 ppm	ICP-MS USP <730>
Cadmium	0.385	ppm	< 1 ppm	ICP-MS USP <730>
Iron	10,240	ppm	8,000 - 20,000 ppm	ICP-OES USP <730>
Magnesium	897	ppm	500 - 10,000 ppm	ICP-OES USP <730>
† Moisture	83.99	%	80 - 90 %	AOAC 930.15
pН	2.3		1.8 - 2.3	EPA 150.1
Sodium	1,823	ppm	1,000 - 3,000 ppm	ICP-OES USP <730>
Total Aerobic Microbial Count	< 10	CFU/g	< 5,000 CFU/g	USP <2021>
Coliform Count	< 3	MPN/g	< 10 MPN/g	FDA BAM
E. Coli Count	< 3	MPN/g	< 10 MPN/g	FDA BAM

THESE RESULTS APPLY ONLY TO THE SAMPLE SUBMITTED AND NOT TO THE PRODUCT FROM WHICH IT WAS TAKEN. THESE RESULTS ARE PROVIDED ONLY FOR THE BENEFIT OF CLIENT, WITHOUT REPRESENTATION OR WARRANTY OF ANY KIND, EXCEPT FOR THE EXPRESS LIMITED WARRANTY PROVIDED SOLELY TO CLIENT IN ADVANCED LABORATORIES' TERMS OF SERVICE.

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Results Approved By:

Alisa Farnsworth-Quality Technician

Dated:

2/12/2020

Tests marked with † were done at Atlas Bioscience Labs, LLC, a joint venture with Advanced Laboratories. -1775 S. Pantano Rd - Ste #110, Tucson, AZ 85710

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1/31/2020

2/12/2020

Client: Ralf Ostertag

Mineral Logic LLC 7136 East "N" Avenue

Kalamazoo, Michigan 49048

Lab No: 187770-01

Analysis	Result	Per Unit	Specifications	Method
Salmonella	Absent	per 10 grams	Absent	USP <2022>
Total Yeast & Mold	< 10	CFU/g	< 1,000 CFU/g	USP <2021>
Yeast *	< 10	CFU/g	< 1,000 CFU/g	
Mold *	< 10	CFU/g	< 1,000 CFU/g	
Specific Gravity	1.086		1.05 - 1.1	Modified USP <841>
Sulfur	20,530	ppm	10,000 - 50,000 ppm	ICP-OES USP <730>
Total Dissolved Solids	13.39	%	12 - 15 %	AOAC 920.193

FDA BAM Method Utilized: 10g sample size

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Description:

Fulvic Minerals-HHD30FA104

Client: Ralf Ostertag

Sample ID:

Mineral Logic LLC 7136 East "N" Avenue

Lot No: Location: Batch Number: 20009

Kalamazoo, Michigan 49048

Received: Completed: 2/17/2020 2/24/2020

Lab No: 188924-01

Analysis	Result	Per Unit	Specifications	Method
† Alanine	0.424	% wt		Derivative-HPLC
† Arginine	0.168	% wt		Derivative-HPLC
† Aspartic acid	< 0.1	% wt		Derivative-HPLC
† Cysteine	0.215	% wt		Derivative-HPLC
† Glutamic acid	0.071	% wt		Derivative-HPLC
† Glycine	0.160	% wt		Derivative-HPLC
† Histidine	0.433	% wt		Derivative-HPLC
† Isoleucine	0.173	% wt		Derivative-HPLC
† Leucine	0.089	% wt		Derivative-HPLC
† Lysine	0.133	% wt		Derivative-HPLC
† Methionine	0.401	% wt		Derivative-HPLC
† Phenylalanine	0.046	% wt		Derivative-HPLC
† Proline	0.266	% wt		Derivative-HPLC
† Serine	0.050	% wt		Derivative-HPLC
† Threonine	0.434	% wt		Derivative-HPLC
† Tryptophan	0.002	% wt		Derivative-HPLC
† Tyrosine	0.448	% wt		Derivative-HPLC
† Valine	1.191	% wt		Derivative-HPLC
† Total Amino Acids	4.704	% wt		Derivative-HPLC

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Batch Number: 20009

Location:

Received: Completed:

2/17/2020 2/24/2020 Client: Ralf Ostertag

Mineral Logic LLC

7136 East "N" Avenue Kalamazoo, Michigan 49048

Lab No: 188924-01

				escribilities little and Aud
Analysis	Result	Per Unit	Specifications	Method
Aluminum	1,971	ppm		ICP-OES USP
				<730>
Antimony	3.66	ppm		ICP-OES USP
				<730>
Barium	< 0.5	ppm		ICP-OES USP
				<730>
Beryllium	4.15	ppm		ICP-OES USP
				<730>
Bismuth	0.976	ppm		ICP-OES USP
				<730>
Boron	< 0.5	ppm		ICP-OES USP
				<730>
Cerium	21.061	ppm		ICP-MS USP <730>
Cesium	0.005	ppm		ICP-MS USP <730>
† Chloride	137.0	ppm		USP <221>
				Titration
Chromium	4.75	ppm		ICP-OES USP
				<730>
Cobalt	15.2	ppm		ICP-OES USP
				<730>
Copper	< 0.5	ppm		ICP-OES USP
				<730>

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Sample ID: Lot No:

Batch Number: 20009

Mineral Logic LLC 7136 East "N" Avenue

Location:

Batch Number: 20009

Kalamazoo, Michigan 49048

Received:

2/17/2020

Completed: 2/24/2020

Lab No: 188924-01

Analysis	Result	Per Unit	Specifications	Method
Dysprosium	1.532	ppm		ICP-MS USP <730>
Erbium	0.793	ppm		ICP-MS USP <730>
Europium	0.387	ppm		ICP-MS USP <730>
† Fluoride	0.02	ppm		AOAC 939.11
Gadolinium	1.763	ppm		ICP-MS USP <730>
Gallium	0.057	ppm		ICP-MS USP <730>
Germanium	0.019	ppm		ICP-MS USP <730>
Gold	1.30	ppm		ICP-OES USP <730>
Hafnium	0.199	ppm		ICP-MS USP <730>
Holmium	0.287	ppm		ICP-MS USP <730>
Indium	0.009	ppm		ICP-MS USP <730>
† Iodine	0.34	ppm		Titration
Iridium	0.002	ppm		ICP-MS USP <730>
Lanthanum	10.3	ppm		ICP-OES USP <730>
Lithium	<0.5	ppm		ICP-OES USP <730>
Lutetium	0.085	ppm		ICP-MS USP <730>
Magnesium	898	ppm		ICP-OES USP <730>

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Lab No: 188924-01

Analysis	Result	Per Unit	Specifications	Method
Manganese	49.7	ppm		ICP-OES USP
				<730>
Molybdenum	< 0.5	ppm		ICP-OES USP
				<730>
Neodymium	8.134	ppm		ICP-MS USP <730>
Nickel	19.0	ppm		ICP-OES USP
				<730>
Niobium	< 0.5	ppm		ICP-OES USP
				<730>
Osmium	< 0.001	ppm		ICP-MS USP <730>
Palladium	0.047	ppm		ICP-MS USP <730>
Phosphorus	110	ppm		ICP-OES USP
•				<730>
Platinum	< 0.001	ppm		ICP-MS USP <730>
Potassium	129	ppm		ICP-OES USP
				<730>
Praseodymium	1.983	ppm		ICP-MS USP <730>
Rhenium	0.001	ppm		ICP-MS USP <730>
Rhodium	0.001	ppm		ICP-MS USP <730>
Rubidium	0.317	ppm		ICP-MS USP <730>
Ruthenium	< 0.001	ppm		ICP-MS USP <730>

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Kalamazoo, Michigan 49048

Lab No: 188924-01

Analysis	Result	Per Unit	Specifications	Method
Samarium	1.850	ppm		ICP-MS USP <730>
Scandium	1.879	ppm		ICP-MS USP <730>
Selenium	<0.5	ppm		ICP-OES USP <730>
Silicon	43.3	ppm		ICP-OES USP <730>
Silver	<0.5	ppm		ICP-OES USP <730>
Strontium	0.733	ppm		ICP-OES USP <730>
Tantalum	0.004	ppm		ICP-MS USP <730>
Tellurium	<0.5	ppm		ICP-OES USP <730>
Terbium	0.294	ppm		ICP-MS USP <730>
Thallium	<0.5	ppm		ICP-OES USP <730>
Thorium	7.01	ppm		ICP-OES USP <730>
Thulium	0.104	ppm		ICP-MS USP <730>
Tin	0.003	ppm		ICP-MS USP <730>
Titanium	0.707	ppm		ICP-OES USP <730>

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Completed:

2/24/2020

Lab No: 188924-01

Analysis	Result	Per Unit	Specifications	Method
Tungsten	<0.5	ppm		ICP-OES USP <730>
Vanadium	3.84	ppm		ICP-OES USP <730>
Ytterbium	0.662	ppm		ICP-MS USP <730>
Yttrium	9.39	ppm		ICP-OES USP <730>
Zinc	73.0	ppm		ICP-OES USP <730>
Zirconium	2.15	ppm		ICP-OES USP <730>

Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Total Amino Acids, Tryptophan, Tyrosine and Valine analysis performed using HPLC following derivatization according to the AccQtag methodology (Waters, Inc.) using 20 mM HCl, Borate buffer, and AQC reagent in acetonitrile (1:3:1, v/v/v), followed by HPLC using Waters Extera C18 column (150x3.5mm, 3µm), 40°C, with isocratic mobile phase consisting of 20mM Potassium phosphate, pH3.0/Acetonitrile (95:5) 1.5ml/min with UV detection (254nm). Authentic chemical reference material obtained from Sigma-Aldrich.

Chloride <221> titration procedure with AgNO3 precipitation reaction.

Iodine analysis performed by 0.1N sodium thiosulfate titration of acidified digest centrifuged supernatant. Starch indicator solution was used to determine the end-point of the titration. Reagents employed were obtained from Sigma-Aldrich.

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ANALYTICAL REPORT

TO:

Ralf Ostertag Mineral Logic LLC 8100 Oakland Dr. Portage, MI 49024 EMAIL:

ralf@minerallogic.com

P.O.#:

COC# 2001

DATE:

June 21, 2015

		Lab Number: 22998-01
Sample:	MLG-50	Lot Number: 110613

Analyte	Result	Unit
Acetic acid	0.02	% wt
Adipic Acids	< 0.001	% wt
Butyric Acid	< 0.001	% wt
Citric Acid	< 0.001	% wt
Formic Acid	< 0.001	% wt
Fumaric Acid	0.16	% wt
Glycolic Acids	< 0.001	% wt
Isocitric Acid	< 0.001	% wt
Lactic Acid	0.01	% wt
Malic Acid	0.02	% wt
Malonic Acid	< 0.001	% wt
Oxalic Acid	< 0.001	% wt
Propionic Acid	< 0.001	% wt
Succinic Acid	0.02	% wt
Tartaric Acid	< 0.001	% wt
Aconitic Acid (all isomers)	< 0.001	% wt
Benzoic	0.08	% wt
Phenylacetic	0.02	% wt
Shikimic	0.16	% wt



Phthalic	0.12	% wt
Ferulic	0.09	% wt
Syringic	< 0.001	% wt
Coumaric (all isomers)	< 0.001	% wt
Vanillic	< 0.001	% wt
Hydroxy-benzoic (all isomers)	< 0.001	% wt
Caffeic	0.27	% wt
Protocatechuic	0.03	% wt
Gallic	0.75	% wt
Gentesic	< 0.001	% wt
Sinapic	< 0.001	% wt
Rosmarinic	< 0.001	% wt
Cinnamic (all isomers)	0.14	% wt

Organic acid analysis performed using HPLC by method adapted from Lian, H.Z., Mao, L., Ye, X.L., Miao, J. "Simultaneous determination of oxalic, fumaric, maleic and succinic acids in tartaric and malic acids for pharmaceutical use by ion-suppression reversed-phase high performance liquid chromatography" as published in Journal Of Pharmaceutical And Biomedical Analysis, 19(3-4): 621-625, 1999; utilizing reversed-phase ion-suppression high performance liquid chromatography performed on a Nova-Pak C-18 (5µm) (150x4.5mm) column with isocratic elution using water adjusted to pH 2.10-2.15 with perchloric acid, and detection by UV adsorption at 210 nm wavelength. Authentic chemical reference material obtained from Sigma-Aldrich.

Dinesh Patel, Ph.D. Laboratory Director

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