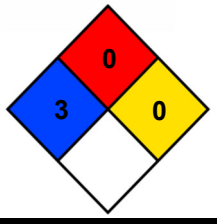
SAFETY DATA SHEET
HUMA GRO® Tuff Greens™



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HEALTH	3
FLAMMABILITY	0
PHYSICAL HAZARD	0
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SECTION 1: CHEMICAL PRODUCT & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER:	**HUMA GRO® Tuff Greens™**	**Product# 393**
GENERAL USE:	Used as a part of a plant nutrition program containing essential minerals, natural plant oils and an organic source of nitrogen.	
PRODUCT DESCRIPTION:	A clear to hazy, dark green liquid having a unique characteristic odor.	

SUPPLIER INFORMATION:
Bio Huma Netics, Inc.
1331 W Houston Avenue
Gilbert, AZ 85233

For Additional SDS call: **PHONE: (480) 961-1220**

EMERGENCY PHONE NUMBERS

CHEMTREC: **(In the USA) 800-424-9300**
(International) 703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

HAZARDS OVERVIEW:

A clear to hazy, dark green, highly alkaline liquid having a unique characteristic odor. The liquid and mists are corrosive to all tissues contacted. Inhalation of mist can cause permanent lung damage. Moderately toxic by ingestion. This product may react vigorously with acids and other substances.

CLASSIFICATION: SKIN CORROSION – CATEGORY 1A
SIGNAL WORD: DANGER
HAZARD STATEMENT: H314; causes severe skin burns and eye damage
PRECAUTIONARY STATEMENT: P260; Do not breathe dusts/mist/vapors. P280; Wear protective gloves/protective clothing/eye protection/face protection P264; Wash hands thoroughly after handling

CLASSIFICATION: HAZARD CATEGORY 5 - MAY BE HARMFUL IF SWALLOWED
SIGNAL WORD: WARNING
HAZARD STATEMENT: H303 - WARNING – may be harmful if swallowed
PRECAUTIONARY STATEMENT: P312; Call a poison center/doctor/physician if you feel unwell

SECTION 3: COMPOSITION & INFORMATION ON INGREDIENTS

				ACGIH		OSHA	
COMPONENT	**CAS #**	**OSHA HAZARD**	**WT %**	**TLV$_{(TWA)}$**	**STEL**	**PEL$_{(TWA)}$**	**STEL**
Potassium Hydroxide	1310-58-3	Corrosive; Toxic by Ingestion	17 ± 3	None	None	None	None
Calcium Nitrate	10124-37-5	Oxidizer; Eye, Skin & Respiratory Irritant; Toxic by Ingestion	3 ± 1	Ceiling: None	None	None	None
Urea	57-13-6	Eye Irritant; Slight to Moderate Skin & Respiratory Irritant; Slightly Toxic by Chronic Dermal Contact & Inhalation, with Cardiovascular & Central Nervous System effects.	2 ± 1	None AIHA WEEL: 10 mg/m^3	None	None	None
Ferrous Sulfate	7720-78-7	Eye Corrosive; Skin, & Respiratory Irritant; Moderately Toxic by Ingestion	1.2 ± 0.2	1 mg/m^3 (as Fe)	None	None	None

NDA = No Data Available **N/A = Not Applicable**

SECTION 4: FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; use the Holger Nielsen method (back pressure-arm lift) or proper respiratory device. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention immediately.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If burn or irritation occurs, call a physician.

INGESTION: If swallowed DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give plenty of water to drink. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Potassium Hydroxide solutions are corrosive to the eyes, skin and mucous membranes and may be moderately toxic by ingestion. If ingested, consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Treat exposure symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

Flashpoint and Method: This product does not flash.

Flammable Limits (in air, % by volume) **Lower:** Not applicable **Upper:** Not applicable

Autoignition Temperature: Not Determined

GENERAL HAZARD: This product is a non-combustible, aqueous solution, of inorganic and organic compounds. The Uniform Fire Code health hazard classification for this product is: **Corrosive (Alkaline).** Diluted solutions of this product may also be corrosive and may generate flammable / explosive Hydrogen gas on contact with some soft metals (such as Aluminum). It may produce hazardous mists or hazardous decomposition products.

FIRE FIGHTING INSTRUCTIONS: **EXTINGUISHING MEDIA:** Water, foam, CO_2 or dry chemicals.
Use a water spray or fog to cool the containers exposed to the heat of a fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: When heated to dryness and decomposition, it emits toxic carbon monoxide, carbon dioxide, potassium oxide, calcium oxide, iron oxide, sulfur oxides and nitrogen oxides, with trace or ultra-trace toxic oxide amounts, of zinc, copper, phosphorus, manganese, magnesium, and sodium plus irritating smoke.

SECTION 6: ACCIDENTAL RELEASE MEASURES

RELEASE TO LAND: Wearing recommended protective equipment and clothing, dike the spill and pick up the bulk of liquid using pumps or a vacuum truck, or absorb the liquid in sand or a commercially absorbent material. Place in approved containers for recovery, disposal, or satellite accumulation. Neutralize the acidity, of the remaining liquid, using soda ash, lime, or other agent appropriate for neutralizing acidic liquids. Flush the spill area with water; collect the rinsates for disposal or sewer, as appropriate.

RELEASE TO WATER: Wear recommended protective equipment and clothing if contact with hazardous material can occur. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. As appropriate, notify all downstream users of possible contamination.

SECTION 7: HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated, area away from incompatible materials and products. Do not get this product in eyes, on skin, or on clothing. Wear recommended personal protective equipment when handling this product. Do not breathe mists. Use only with adequate ventilation. Do not take internally. Keep the containers tightly closed when not in use. Wash thoroughly after handling this product.

This product is corrosive to Tin, Aluminum, Magnesium, Zinc and alloys containing these metals, and will react violently with these metals in powder form. Always add this product, with constant stirring, slowly to the surface of cool to lukewarm (50 – 80° F.) water.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

CONTROL MEASURES: Use a local or general, mechanical exhaust ventilation system capable of maintaining emissions, in the work area, below the OSHA-PEL, ACGIH-TLV or levels that may cause irritation.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

RESPIRATOR: For exposure above the OSHA-PEL or ACGIH Ceiling level, or if use generates mists or aerosols, wear a NIOSH-approved full facepiece or half mask air-purifying cartridge respirator equipped with a good mist / particulate filter cartridge or supplied air. **Note:** Always consult the respirator manufacturer's data when determining the suitability of respiratory protective devices prior to use.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979), unless a full facepiece respirator is worn. **Note:** Always consult the protective eyewear manufacturer's data when determining the suitability of protective eyewear prior to use.

GLOVES: Wear Neoprene, Nitrile, Butyl Rubber, Natural Rubber, or Viton gloves. **Note:** Always consult the glove manufacturer's permeation data when determining the suitability of gloves prior to use.

CLOTHING & EQUIPMENT: Wear a Neoprene, Nitrile, Butyl Rubber or Natural Rubber apron, or full protective clothing when handling this material. An eye wash station and safety shower should be available in the work area. **Note:** Always consult the clothing/equipment manufacturer's permeation data when determining the suitability of clothing/equipment prior to use.

FOOTWEAR: Wear Neoprene, Nitrile, Butyl Rubber or Natural Rubber boots. **Note:** Always consult the footwear manufacturer's permeation data when determining the suitability of footwear prior to use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to hazy, dark green	**Bulk Density (pounds/ft^3):**	Not applicable
Physical State:	Liquid	**Vapor Pressure:**	No data available
Odor:	Unique, characteristic	**Vapor Density (air=1):**	No data available
Odor Threshold:	No data available	**Evaporation Rate (n-Butyl Acetate=1):**	No data available
Molecular Formula:	Mixture	**VOC Content / Organic Matter:**	No data available / 1.0%
Molecular Weight:	Not applicable	**% Volatile:**	No data available
Boiling Point:	Greater than 100° C. (212° F.)	**Solubility in H_2O:**	Complete
Freezing/Melting Point:	Less than 0° C. (32° F.)	**Octanol/Water Partition Coefficient:**	No data available
Specific Gravity:	1.00 – 1.10 @ 20° C.	**pH (as is):**	≥14.0
Density (pounds/gallon):	Approximately 9.18	**pH (1% solution):**	12.0 to 13.0

SECTION 10: STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: Do not store this product below 50° F (10° C) or above 90° F (30° C)

INCOMPATIBLE MATERIAL: Acids and acidic salts, strong oxidizers, organic compounds containing halogens, Aluminum, Magnesium, Zinc, Tin and alloys of these metals.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to dryness and decomposition, it emits toxic oxides of carbon, iron, potassium, calcium, sulfur and nitrogen, with trace or ultra-trace toxic oxide amounts, of zinc, copper, phosphorus, manganese, magnesium, and sodium plus irritating smoke.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

SECTION 11: TOXICOLOGICAL INFORMATION

Components:	**Potassium Hydroxide**	**Calcium Nitrate**
Eye Contact:	Rabbit: 1 mg/24 hours, rinsed; Moderate	No data available
Skin Contact:	Rabbit: 50 mg/24 hours; Severe	No data available
Oral Rat LD_{50}:	273 mg/kg	302 mg/kg
Dermal Rabbit LD_{50}:	Greater than 2 gm/kg	No data available
Inhalation Rat LC_{50}:	No data available	No data available
Human Data:	Dermal Human: 50 mg/24 hours; Severe	No data available
Other Toxicological Data:	No data available	No data available
Carcinogenicity:	No data available	No data available
Teratogenicity:	No data available	No data available
Mutagenicity:	Hamster Cytogenetic Analysis; ovary: 12 mmol/Liter	No data available
Synergistic Products:	None reported	None reported
Target Organs:	Eyes, Skin, Mucous membranes, Lungs & Gastrointestinal tract	Eyes, Skin, Lungs, & Gastrointestinal tract
Medical Conditions Aggravated By Exposure:	Skin, Respiratory or Cardiovascular disorders	Skin, Respiratory or Gastrointestinal disorders

Components:	**Urea**	**Ferrous Sulfate**
Eye Contact:	No data available	No data available
Skin Contact:	No data available	No data available
Oral Rat LD_{50}:	8,471 mg/kg	319 mg/kg
Dermal Rabbit LD_{50}:	No data available (Rabbit, Subcutaneous LD_{Lo}: 3 gm/kg)	No data available
Inhalation Rat LC_{50}:	No data available (Rat, Inhalation, Chronic – Multiple Dose, 288 mg/m^3/17 weeks; Toxic effects: Kidney, Ureter & Bladder – Other changes in urine composition; Blood – Other changes; Nutritional and gross metabolic changes.)	No data available
Human Data:	Human: 22 mg/3 days; Mild	Oral Woman TD_{Lo}: 10,560 ug/kg; Gastrointestinal effects
Other Toxicological Data:	Rat, Dermal, Chronic – Multiple Dose, 3,024 mg/kg/4 weeks; Toxic effects: Liver – Changes in Liver weight; Endocrine – Changes in Thymus weight; Death.	Oral Mouse LD_{50}: 680 mg/kg
Carcinogenicity:	Oral Rat TD_{Lo}: 821 gm/kg/1 year; Tumorigenic – Neoplastic by RTECS criteria; Blood – Tumors; Blood – Lymphomax including Hodgkin's disease.	Subcutaneous Mouse TD_{Lo}:1,600 mg/kg/16 Weeks; Equivocal Tumorigenic Agent, Tumors at application site
Teratogenicity:	Intraplacental Woman TD_{Lo}: 1,400 mg/kg (female 16 Weeks pregnant); Effects on Fertility - Abortion	Oral Rat TD_{Lo}: 7,200 mg/kg (9-14 Days pregnant); Effects on Embryo or Fetus – Fetal death
Mutagenicity:	Human DNA Inhibition; lymphocyte: 600 mmol/Liter	Cytogenetic Analysis – Hamster, Ovary: 5 mmol/ Liter
Synergistic Products:	None reported	None reported
Target Organs:	Eyes, Skin, Mucous membranes, Lungs, Cardiovascular & Central Nervous Systems	Eyes, Skin, Lungs, Liver, Gastrointestinal Tract & Lymphatic System
Medical Conditions Aggravated By Exposure:	Skin, Respiratory or Cardiac disorders	Skin, Liver or Respiratory disorders

SECTION 12: ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

This product is soluble in water. No specific environmental fate information is available. This product will significantly affect the pH of water.

ENVIRONMENTAL CONSIDERATIONS:

The aquatic toxicity has not been determined for this product. However, the aquatic toxicity rating for Potassium Hydroxide: 2 (TLM96: 100 to 10 ppm). TLM96 for Mosquito fish (Gambusia affinis) = 80 ppm. Lethal Dose (24 hour exposure): Trout = 50 ppm. Bluegills = 56 ppm. Minnows (Lepomis pallidus) = 28 ppm.

SECTION 13: DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATON: RCRA Corrosive Waste (United States)

U.S. EPA WASTE NUMBER/DESCRIPTION: D002

If this product is disposed of as shipped, it meets the criteria of a hazardous waste as defined under 40 CFR 261 due to its corrosivity. If this product becomes a waste, it will be a hazardous waste, which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment.

SECTION 14: TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: **Potassium hydroxide, solution**

Hazard Class: 8 **UN Number:** UN1814 **Packing Group:** II

Primary Label: Corrosive **Subsidiary Label(s):** None

Primary/Subsidiary Placards: Corrosive

DOT Reportable Quantity (RQ): 1,000 pounds (KOH) **RQ for Product:** 5,882 pounds (568 gallons)

Marine Pollutant: No

2012 North American Emergency Response Guidebook No.: **154**

TDG PROPER SHIPPING NAME: **Potassium hydroxide, solution**

Hazard Class: 8 **UN Number:** UN1814 **Packing Group:** II

Primary Label: Corrosive **Subsidiary Label(s):** None

Primary/Subsidiary Placards: Corrosive

TDG Reportable Quantity (RQ): * At least 5 kg or 5 liters

TDG Schedule XII: Not listed

Regulated Limit (RL): ** 50 kg (KOH) **RL for Product:** 294.1 kg (237.2 liters)

Other Shipping Information: None

* Canadian Transportation of Dangerous Goods Regulations (TDGR), Part IX, Table I, Quantities or levels for Immediate Reporting: releases of reportable quantities, RQ, that meet the definition of a "dangerous occurrence" (a threat to life, health, property, or the environment) must be reported to the appropriate authorities as outlined in TDGR 9.13(1) and 9.14(1). ** Reporting to Environment Canada is required for any releases exceeding the regulated limits, RL, of 9.2 materials (primary or secondary). The regulated limits are found in Schedule XIII of the TDGR.

SECTION 15: REGULATORY INFORMATION

COMPONENTS:	**Potassium Hydroxide**	**Calcium Nitrate**	**Urea**	**Ferrous Sulfate**
OSHA Target Organs:	Eyes, Skin, Mucous membranes, Lungs & Gastrointestinal tract	Eyes, Skin, Lungs, & Gastrointestinal tract	Eyes, Skin, Mucous membranes, Lungs, Cardiovascular & Central Nervous Systems	Eyes, Skin, Lungs, Liver, Gastrointestinal & Lymphatic Systems
Carcinogenic Potential:				
Regulated by OSHA:	No	No	No	No
Listed on NTP Report:	No	No	No	No
Listed by IARC:	No	No	No	No
IARC Group:	Not applicable	Not applicable	Not applicable	Not applicable
ACGIH Appendix A:	Not listed	Not listed	Not listed	Not listed
A1 Confirmed Human:	Not applicable	Not applicable	Not applicable	Not applicable
A2 Suspected Human:	Not applicable	Not applicable	Not applicable	Not applicable

U.S. EPA Requirements

Release Reporting				
CERCLA (40 CFR 302)				
Listed Substance:	Yes	Not listed	Not listed	Yes
Reportable Quantity:	1,000 pounds	Not applicable	Not applicable	1,000 pounds
Category:	C	Not applicable	Not applicable	C
RCRA Waste No.:	None listed	Not applicable	Not applicable	None listed
Unlisted Substance:	Not applicable	Yes	Not applicable	Not applicable
Reportable Quantity:	Not applicable	100 pounds	Not applicable	Not applicable
Characteristic:	Not applicable	Ignitability	Not applicable	Not applicable
RCRA Waste No.:	Not applicable	D001	Not applicable	Not applicable

SECTION 15: REGULATORY INFORMATION (Continued from Page 5)

COMPONENTS:	Potassium Hydroxide	Calcium Nitrate	Urea	Ferrous Sulfate
SARA TITLE III				
Section 302 & 303 (40 CFR 355):				
Listed Substance:	Not listed	Not listed	Not listed	Not listed
Reportable Quantity:	Not applicable	Not applicable	Not applicable	Not applicable
Planning Threshold:	Not applicable	Not applicable	Not applicable	Not applicable
Section 311 & 312 (40 CFR 370):				
Hazard Categories (**product**):	**Fire: N** **Sudden Release of Pressure: N** **Reactive: N** **Acute Health: Y** **Chronic Health: N**			
Planning threshold:	10,000 pounds	10,000 pounds	10,000 pounds	10,000 pounds
Section 313 (40 CFR 372):				
Listed Toxic Chemical:	Not listed	Yes (Nitrate Compounds)	Not listed	Not listed
Reporting Threshold:	Not applicable	10,000 pounds	Not applicable	Not applicable
U.S. TSCA Status				
Listed (40 CFR 710):	Yes	Yes	Yes	Yes
State Regulations				
State of California: Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65):				
Carcinogen:	No	No	No	No
Reproductive Toxin:	No	No	No	No

Other Regulations

State Right To Know Laws: MA, NJ, PA, CA

Canadian Regulations

Product Information:

Controlled Product:	**Yes**
WHMIS Hazard Symbols:	**Corrosive Material**
WHMIS Class & Division:	**E**

Ingredient Information:				
IDL Substance:	Yes	No	No	No
DSL or NDSL Lists:	DSL	DSL	DSL	DSL

SECTION 16: OTHER INFORMATION

EPA Registration number: Not applicable

Approved Product Uses: Used as part of a plant nutrition program.

Special Notes:

This product is not manufactured, or formulated to contain substances, which the State of California has found to cause cancer and/or birth defects or other reproductive harm. However, as it contains mined minerals, this product may contain trace (parts per million) or ultra-trace (parts per billion) of elements known to the State of California to cause cancer, birth defects or other reproductive harm.

Special Instructions: When making dilutions, always add Tuff Greens™ to water with adequate mixing to ensure a uniform solution. Do not allow this product to contact Aluminum, Magnesium, Zinc, Tin, or their alloys as this will generate flammable / explosive Hydrogen gas and severely corrode the metal.

SDS Revision Information: Revised Date: 9/08/2020

SDS Distributed by: Bio Huma Netics, Inc.

Prepared By:	Frank S. Pidgeon, Sr. EHSS Director	**Date Prepared:**	October 21, 2014