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**SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

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**1.1 Product Identifier**

Trade name or designation of mixture: GreensandPlus™  
Other means of identification: None

**1.2 Intended Use of the Product**

GreensandPlus™ is a specially selected granular substrate with a manganese dioxide coating used for water purification - the removal of heavy metals and sulfur compounds.

**1.3 Details of the supplier of the safety data sheet**

**Supplier: Inversand Company**  
P.O. Box 650  
Clayton, NJ 08312 United States  
Phone: (856) 881-2345  
Fax: (856) 881-6859  
Email: mail@inversand.com

**1.4 Emergency Telephone Number**  
(856) 881-2345

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**SECTION 2: HAZARDS IDENTIFICATION**

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**2.1 Classification of the Substance or Mixture**

Not a fire or spill hazard. Low toxicity, dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.

**2.2 Label Elements**

Hazard Symbol: None  
Signal Word: None  
Hazard Statements: The mixture does not meet the criteria for classification.

**2.3 Other Hazards**

Derived from natural ores; no adverse environmental affects known. However, prevent spilled product from entering streams, water bodies, and wastewater systems.

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**SECTION 3: COMPOSTION / INFORMATION ON INGREDIENTS**


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**3.1 Mixtures**

Component	Synonyms and Trade Names	CAS No.	% by Wgt.
Manganese Dioxide	Manganese Dioxide; Manganese Black; Manganese (IV) Oxide; Peroxide Manganese Superoxide.	1313-13-9	3.2-4.8
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	N/A	3.2-4.8
Quartz (SiO <sub>2</sub> )	Agate; Cristobalite; Crystallizes Silicone Dioxide; Quartz Silica; Silica Dust; Silica Flour (Powdered Crystalline Silica); Silica, Crystalline Quartz; Tripoli.	14808-60-7	90.4-93.6

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**SECTION 4: FIRST-AID MEASURES**


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**4.1 Description of First-Aid Measures**

**Eye Contact:** Remove material by immediately flushing eyes with clean, flowing, lukewarm water (low pressure) for at least at least 15 minutes. Get medical attention if pain or irritation persists.

**Skin Contact:** Immediately wash affected area with mild soap and water to remove any dust adhering to the skin. Get medical attention if irritation develops or persists.

**Inhalation:** If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel and get medical attention.

**Ingestion:** Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious; give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel since particles may be aspirated into lungs. Seek immediate medical attention.

**Note to Physicians:** None.

- 4.2 Most Important Symptoms and Effects, Both Acute and Delayed**  
Over exposure by inhalation of airborne particulate, dust, or fumes is irritating to the nose, throat, and respiratory tract. Inhaling excessive level of dust may be harmful. Prolong or repeated contact may cause slight to moderate skin irritation. Contact with particulate may cause slight to moderate eye irritation. Abrasive action of dust particulate can damage eye.
- 4.3 Indication of Medical Attention and Special Treatment Needed**  
Treat symptomatically.

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## SECTION 5: FIRE-FIGHTING MEASURES

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The product is nonflammable

- 5.1 Extinguishing Media:** Use dry chemical or CO2 to extinguish fires involving this material.
- 5.2 Special Hazards arising from the Substance or Mixture:** Material will not burn. Although not combustible, this material is a strong oxidizing agent, which liberates oxygen during thermal decomposition. It may increase the burning rate of combustibles with a flare-burning effect. It may cause reignition after a fire is extinguished.
- 5.3 Advice for Fire-Fighters:** Material should be kept out of eyes and of skin. As in any fire, wear self-contained breathing apparatus pressure-demand. MSHA/NIOSH (approved or equivalent) and full protective gear. Do not release runoff from fire control methods to sewers or waterways.

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## SECTION 6: ACCIDENTAL RELEASE MEASURES

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- 6.1 Personal Precautions, Protective Equipment and Emergency Procedures:** Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Eliminate all sources of ignition. Avoid contact with eye and skin or inhalation of dust.
- 6.2 Environmental Precautions:** Product is dry solid (granular or powder) and not readily soluble in water. However, prevent spilled product from entering streams, water bodies, and wastewater systems.
- 6.3 Methods and Materials for Containment and Clean Up:** Contain any spills to prevent migration and entry into sewers or streams. Vacuum or sweep up dry material and place in container for reuse. Avoid creating excessive airborne dust. Cleanup personnel need to wear approved respiratory protection (air-purifying or air supply), gloves, long sleeved clothing, and goggles to prevent irritation from contact and inhalation.

## SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for Safe Handling:** Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with skin and eyes. Wash thoroughly after handling.
- 7.2 Conditions for Safe Storage, Including an Incompatibilities:** Store in a cool, dry area. Keep container closed when not in use. Product or component is a powerful oxidizer, hence it should not be stored near organic material or other easily oxidizable substances; e.g. sulfur, sulfides phosphides, hypophosphides, etc. or incompatible materials such as hydrogen peroxide and sodium peroxide.
- 7.3 Specific End Use(s):** For water purification use to remove heavy metals and Sulphur compounds.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control Parameters

Component	Percentage (by wgt.)	OSHA		ACGIH TLV		NIOSH REL		LISTED CARCINOGEN (YES/NO)		
		PEL (mg/m <sup>3</sup> )	CEILING (mg/m <sup>3</sup> )	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )	NTP	IARC	OSHA
Manganese Dioxide (MnO <sub>2</sub> )	3.2-4.8.	N/A	5F (as Mn)	5F (as Mn)	NL	1 (as Mn)	3 (as Mn)	NO	NO	NO
Nonhazardous Ingredients / Inert Materials / Proprietary	3.2-4.8	1S T; S	NL	10 T; 5R	NL	NL	NL	NO	NO	NO
Quartz (SiO <sub>2</sub> )	90.4-93.6	10/(% SiO <sub>2</sub> +2)	NL	0.025	0.1	0.05	NL	YES	YES	YES

#### Notes:

- T Total Dust; R = Respirable dust, F = Fume
- Exposure limits listed for each ingredient is for exposure to dust that may be generated during product transfer and handling.
  - Solid Manganese: 0.35-1.00 mm is formulated for use in water purification. Health effects resulting from this product being used for any other purpose of process is not addressed in the material safety data sheet.
  - NTP Class 2A: Reasonably anticipated to be a carcinogen limited evidence of carcinogenicity from studies in humans.
  - IARC Group 2A: Probably carcinogenic to humans.
  - NIOSH considers crystalline silica to be a potential occupational carcinogen as defined by the OSHA carcinogen policy [29 cfr 1990].

## 8.2 Exposure Controls

**Engineering Controls:** If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits in this section.

**Personal Protective Equipment:** Eye & Face Protection. Skin Protection. Respiratory Protection.



**Eye & Face Protection:** Corrosive to eyes. Wear protective safety goggles when dust generation is likely.

**Skin Protection:** Wear clothing sufficient to cover the skin, safety shoes, and leather gloves for hand protections against dry material.

**Respiratory Protection:** Use NIOSH.MSHA approved respiratory protection (air-purifying or air supply) when concentrations are above exposure limit value. A respiratory protection program that meets OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

**General Hygiene Considerations:** Wash thoroughly after using product. Wash contaminated clothing. Wash hands before eating or drinking.

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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### 9.1 Information on Basic Physical and Chemical Properties

**Appearance:** A uniform, brownish-black, granular material.

**pH:** 6.5 – 7.5 (10% aqueous slurry)

**Odor:** Odorless.

**Evaporation Rate:** N/A

**Melting point:** >2700°F

**Freezing point:** Solid at STP

**Boiling Point:** N/A

**Flash Point:** N/A

**Auto-Ignition Temperature:** Not self-igniting

**Decomposition Temperature:** No data available

**Flammability (solid, gas):** Non flammable

**Vapor Pressure:** N/A

**Vapor Density:** N/A

**Relative Density:** 88 lbs/ft<sup>3</sup>

**Specific Gravity:** 2.5

**Solubility:** Insoluble in water

**Partition Coefficient:N-Octanol/Water:** N/A

**Viscosity:** N/A

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## SECTION 10: STABILITY AND REACTIVITY

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- 10.1 Reactivity:** Material is flammable by chemical reaction. Keep away from heat and flammable materials
- 10.2 Chemical Stability:** Stable under normal conditions of storage.
- 10.3 Possibility of Hazardous Reactions:** None under normal circumstances.
- 10.4 Conditions to Avoid:** Manganese dioxide (MnO<sub>2</sub>) is a powerful oxidizer, hence it should not be heated with organic matter or other easily oxidizing substances, e.g. sulfur, sulfides, phosphides, hypophosphides, etc.
- 10.5 Incompatible Materials:** Incompatible with hydrogen peroxide and sodium peroxide.
- 10.6 Hazardous Decomposition Products:** Not produced under normal circumstances.

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**SECTION 11: TOXICOLOGICAL INFORMATION**


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**RTECS Toxicity Data for Product Components:**

Component	CAS No.	RTECS Toxicity Data
Manganese Dioxide (MnO <sub>2</sub> )	1313-13-9	<p>Acute Dermal: Mouse LD 50 Route; Subcutaneous Dose: 422 mg/kg.</p> <p>Chronic (Multiple Dose) Inhalation: Rate Dose:1800 ug/m<sup>3</sup>/24H/35D-C; Toxic Effects: Brain and coverings – Recordings from specific areas of CNS;</p> <p>Biochemical –Charges in serum composition; Biochemical – True cholinesterase.</p> <p>Reproductive/Teratogenic: Mouse Route: Inhalation; Dose: 49 mg/m<sup>3</sup>/7H; Duration: female 75D prior to mating effects on Newborn – Growth statistics; Behavioral.</p>
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	N/A
Quartz (SiO <sub>2</sub> )	14808-60-7	<p>Acute Inhalation: Human LC Lo Dose: 300 ug/m<sup>3</sup>/10Y-1; toxic Effects: Liver - Other changes; Human TC Lo Dose: 16 mppcf/8H/17,9Y-1; Toxic Effects: Lungs, thorax of Respiration-Fibrosis, focal (pneumoconiosis); Lungs, Thorax of Respiration - Cough; Lungs, Thorax of Respiration - Dyspnea.</p> <p>Chronic (Multiple Dose) Inhalation: Rat Dose: 80 mg/m<sup>3</sup>/28W-1; Toxic Effects: Lungs, Thorax of Respiration - Fibrosis, focal (pneumoconiosis); Blood – Changes in spleen. Rat Dose: 108 mg/m<sup>3</sup>/6H/3D-1; Toxic Effects: Biochemical – Other oxidoreductases;</p> <p>Biochemical - Other Proteins: Rat Dose: 58 mg/m<sup>3</sup>/13W-1; Toxic Effects: Lungs, Thorax of Respiration – Other changes: Endocrine – Changes in thymus weight; blood – Changes in leukocyte (WBC) cell count. Rat Dose: 4932 mg/m<sup>3</sup>/8H21W-1; Toxic Effects: Endocrine – Changes in spleen weight.</p> <p>Immunological including allergic – Decrease in humoral immune response. Rat Dose: 20 mg/m<sup>3</sup>/3W-1; Toxic Effects: Lungs, Thorax of Respiration – Other changes: Lungs, Thorax of Respiration – Changes in Lung weight.</p>

Component	CAS No.	RTECS Toxicity Data
Quartz (SiO <sub>2</sub> )	14808-60-7	Biomedical – Other enzymes. Mutagenic: Human Micronucleus Test: Cell Type: lung, Dose 40 mg.cm <sup>2</sup> . Hamster Micronucleus Test: Cell type: lung; Dose 50 mg/cm <sup>2</sup> . Tumorigenic: Rat Route: Inhalation: Dose 50 mg/m <sup>3</sup> /6H/71W-1: Toxic Effects: Tumorigenic – Carcinogenic by RTECS, criteria: Liver, Tumors, Rat Route: Intravenous: Dose: 50 mg/kg: Toxic Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria; Blood – Lymphoma including Hodgkin's disease.

## SECTION 12: ECOLOGICAL INFORMATION

Not classified as hazardous to the aquatic environment. The information on toxicity or other environmental effects is not relevant for the product itself as it is an insoluble material. Toxicity values are provided for the critical constituent Manganese dioxide (MnO<sub>2</sub>)

### 12.1 Toxicity

#### **Aquatic toxicity/Short Term toxicity:**

Fish (mortality), *Oncorhynchus mykiss*, LC50 (96 h): > 100% v/v saturated solution (OECD 203)

Aquatic invertebrates (immobilization), *Daphnia magna*, EC50 (48 h): >100% v/v saturated solution (OECD 202)

Aquatic invertebrates (immobilization), *Daphnia magna*, EC50 (48 h), EC50 (48 h): >0.0735 mg/l as test item test (MnO<sub>2</sub>).

Algae (growth rate), *Pseudokirchneriella subcapitata*, EC50 (72 h): >100% v/v saturated solution (OECD 201)

#### **Long Term Toxicity:**

Aquatic invertebrates (reproduction), *Ceriodaphnia dubia*, NOEC (8 d): 10% v/v saturated solution dissolved mg/l (OECD 211)

#### **Toxicity to micro-organisms:**

Activated sludge respiration inhibition, NOEC (3 h): 1000 mg/l.

### 12.2 **Persistence and degradability:** Biodegeneration or hydrolysis is not relevant as the product is inorganic solid material and insoluble in water.

### 12.3 **Bioaccumulative potential:** Not relevant information as the product is inorganic solid material and insoluble in water. Manganese in the product is an essential trace nutrient in animals and for the photosynthetic process in plants. Hence unacceptable bioaccumulation is highly unlikely to occur in any organism due to their ability to regulate intake and loss from natural sources.



- 12.4 Mobility in Soil:** Not relevant information as the product is inorganic solid material and insoluble in water.
- 12.5 Results of PBT and vPvB assessment:** Assessment is not applicable for inorganic substances.
- 12.6 Other adverse effects:** No reason for any hazard classification under CLP or DSD for atmospheric environment (the ozone layer).

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## SECTION 13: DISPOSAL CONSIDERATIONS

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### 13.1 Waste Treatment Methods

**RCRA:** This product as manufactured is not a RCRA listed hazardous waste and does not exhibit any characteristics of a hazardous waste, including toxicity (by EPA TCLP method).

**Disposal Method:** This product is generally suitable for landfill disposal. Follow all applicable Federal, State, and Local laws, rules, and regulations regarding the proper disposal of this material. If this product has been altered or contaminated with other hazardous materials, appropriate waste analysis may be necessary to determine the proper method of disposal. A qualified environmental professional should determine waste characterization, disposal, and treatment methods for this material in accordance with applicable Federal, State, and Local regulations and requirements.

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## SECTION 14: TRANSPORT INFORMATION

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- 14.1 In Accordance with DOT:** This product is not regulated by USDOT as a hazardous material (49 CFR part 172.101). No placard required for transportation.
- 14.2 In Accordance with IMDG:** Not regulated as dangerous goods.
- 14.3 In Accordance with IATA:** Not regulated as dangerous goods.
- 14.4 Transport in Bulk according to AnnexII of MARPOL 73/78 and the IBD Code:** N/A.

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**SECTION 15: REGULATORY INFORMATION**


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**15.1 US Federal Regulations:**

Component	CAS No.	Federal				
		RCRA	CERCLA	SARA	SARA EHS	TSCA
Manganese Dioxide (MnO <sub>2</sub> )	1313-13-9	NO	YES <sup>1</sup>	YES (as compound)	NO	YES
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	NO	NO	NO	NO	NO
Quartz (SiO <sub>2</sub> )	14808-80-7	NO	NO	NO	NO	YES

**Notes:**

1. Listed as Compound per CAA Section 112
2. Listed per CWA Section 307(a) RQ: 10 lb. (4.535 kg)
3. Listed as compound

**15.2 US State Regulations:**

Component	CAS No.	State (Right-To-Know)			
		PA	NJ	MA	CA
Manganese Dioxide (MnO <sub>2</sub> )	1313-13-9	NO	NO	NO	NO
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	NO	NO	NO	NO
Quartz (SiO <sub>2</sub> )	14808-80-7	YES	NO	YES	NO

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**SECTION 16: OTHER INFORMATION**


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**Other Information:** This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

**Hazardous Materials Identification System of the National Paint & Coatings Association**
**Health**

- 0 – Normal Material
- 1 – Slightly Hazard / Significant Irritation
- 2 – Hazardous / Temporary incapacitation or residual injury
- 3 – Extreme Danger / Serious or permanent injury
- 4 – Deadly

HMIS (NPCA)	
Health	2
Flammability	0
Reactivity	1
Personal Protection	E

**Reactivity**

- 0 – Stable
- 1 – Unstable under heat or pressure
- 2 – Violent chemical change under heat or pressure
- 3 – Shock and heat may detonate
- 4 – Capable of detonation or explosion

**Flammability**

- 0 – Will not burn
- 1 – Must be preheated before ignition will occur (Flash point greater than 200°F)
- 2 – Must be moderately heated before ignition will occur (Flash point 100°F to 200°F)
- 3 – Can be ignited under almost all ambient temperatures (Flash point 73°F to 100°F)
- 4 – Will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or will burn readily when dispersed in air (Flash point below 73°F)

**Personal Protection**

- A – Safety Glasses
- B – Safety Glasses + Gloves
- C – Safety Glasses + Gloves + Apron
- D – Face Shield + Gloves + Apron
- E – Safety Glasses + Gloves + Dust Respirator
- F – Safety Glasses + Gloves + Apron + Dust Respirator
- G – Safety Glasses + Gloves + Vapor Respirator
- H – Splash Goggles + Gloves + Apron + Vapor Respirator
- I – Safety Glasses + Gloves + Dust and Vapor Respirator
- J – Splash Goggles + Gloves + Apron + Dust and Vapor Respirator
- K – Air Line Hood or Mask + Gloves + Full Suit Boots
- X – Ask supervisor or safety specialist for handling instructions

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Note: GreensandPlus™ is a trademark of the Inversand Company.