



**Potential Adverse Health Effects:****Likely Routes of Exposure:** Inhalation and skin contact**Eye Contact:** Manage® Turf herbicide may cause pain, redness and tearing based on toxicity studies.**Skin Contact:** Manage® Turf herbicide is no more than slightly toxic or slightly irritating based on toxicity studies.**Ingestion:** Manage® Turf herbicide is no more than slightly toxic based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.**Inhalation:** Manage® Turf herbicide is no more than slightly toxic if inhaled based on toxicity studies.**Note:** Manage® Turf herbicide contains less than 1.0% sodium sulfite. In sulfite-sensitive individuals, skin reactions have been reported following dermal exposures, and respiratory reactions have been reported on ingestion of food, or on ingestion or inhalation of medications which contain related sulfiting agents (bisulfites or metabisulfites) as preservatives. Individuals with asthma may be more prone to these types of reactions.

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**4. FIRST AID MEASURES****If In Eyes:** Immediately flush with plenty of water. Get medical attention.**If Swallowed:** Remove visible particles from mouth and rinse thoroughly with water. Swallow water to dilute. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.**NOTE:** For additional human emergency first aid or treatment guidance, call collect, anytime, day or night (314) 694-4000.

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**5. FIRE FIGHTING MEASURES****Flash Point:** This material is not combustible as tested by the Tag Closed Cup Test**Auto Ignition Temperature:** Not determined**Extinguishing Media:** Use appropriate extinguishing media for exposure fire**Special Fire Fighting Procedures:** Firefighters and others that may be exposed to vapors, mists, dusts, or products of combustion should wear full protective clothing and self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.**Unusual Fire or Explosion Hazards:** None

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**6. ACCIDENTAL RELEASE MEASURES**

Observe all protection and safety precautions when cleaning up spills - See Exposure Controls/Personal Protection, Section 8.

Collect solid material and place in a metal drum or plastic-lined fiber drum and dispose of in accordance with instructions provided under DISPOSAL. After all material is removed, wash floors and other impervious surfaces with an industrial detergent solution and rinse with water.

**7. HANDLING AND STORAGE ♣**

Handling:

Avoid contact with eyes or clothing  
 Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.  
 Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.  
 Do not apply directly to water, to areas where surface water is present or to intertidal areas below mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Storage:

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.  
 Store under cool, dry conditions (below 120°F). Do not store under moist conditions.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

Personal Protective Equipment:

**Eye Protection:** Manage® Turf herbicide may cause slight eye irritation. Wear chemical safety goggles to prevent eye contact during operations such as mixing or transfer or other activities when there is potential for eye contact.

**Skin Protection:** Although Manage® Turf herbicide does not present a significant skin concern, minimize skin contamination by following good industrial hygiene practice. Wash hands and contaminated skin thoroughly after handling. Applicators and other handlers must wear long-sleeved shirt and long pants and shoes plus socks. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**Respiratory Protection:** Avoid breathing dust. This product is not likely to pose an airborne exposure concern when handled and used in accordance with label instructions.

**Ventilation:** Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Exposure Guidelines:

<u>Exposure Limits</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Manage® Turf herbicide	None established	None established
Kaolin Clay	15 mg/m <sup>3</sup> 8-hr TWA	10 mg/m <sup>3</sup> total dust 8-hr TWA *
"	5 mg/m <sup>3</sup> 8-hr TWA respirable fraction	
Amorphous Silica, Hydrated	6 mg/m <sup>3</sup> 8-hr TWA	10 mg/m <sup>3</sup> 8-hr TWA *

• value for dust containing < 1% crystalline silica

**9. PHYSICAL AND CHEMICAL PROPERTIES ♣**

**Appearance:** beige granules

Odor: scorched vanilla  
pH: 6.6 (1% solution)  
Density: 41 lbs/cu ft

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

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## 10. STABILITY AND REACTIVITY ♣

<b>Chemical Stability:</b>	This product should be stable for at least two years under normal conditions of warehouse storage.
<b>Conditions to Avoid:</b>	Store under cool, dry conditions (below 120°F). Keep container tightly closed when not using.
<b>Incompatibility with Other Materials:</b>	None
<b>Hazardous Decomposition Products:</b>	None known
<b>Hazardous Polymerization:</b>	Will not occur

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## 11. TOXICOLOGICAL INFORMATION

Data from Monsanto studies with Manage® Turf herbicide indicate the following:

<b>Oral LD<sub>50</sub> (Rat):</b>	1287 mg/Kg, Slightly Toxic (Category III)
<b>Dermal LD<sub>50</sub> (Rat):</b>	> 5,000 mg/Kg, Practically Nontoxic (Category IV)
<b>Eye Irritation (Rabbit):</b>	Moderately Irritating (Category III)
<b>Skin Irritation (Rabbit):</b>	Slightly Irritating (Category IV)
<b>Acute Inhalation (Rat, 4-hr):</b>	> 5.7 mg/L, Practically Nontoxic (Category IV)
<b>Dermal Sensitization (G. Pig):</b>	Manage® Turf herbicide is not considered a dermal sensitizer in guinea pigs.

### COMPONENTS

Data from laboratory studies conducted by Monsanto and from the available literature on the components of Manage® Turf herbicide:

#### Halosulfuron-methyl

Halosulfuron-methyl, the active herbicidal ingredient in Manage® Turf herbicide, is considered to be practically nontoxic orally or by inhalation and no more than slightly toxic dermally. It is slightly irritating to eyes and essentially nonirritating to the skin. Halosulfuron-methyl did not produce skin allergy in the guinea pig.

Following 90 day repeated exposure to Halosulfuron-methyl in the feed, rats showed decreased weight gain, slight biochemical alterations, and effects on the kidneys and liver (NOEL 400 ppm).

Dogs similarly treated showed decreased body weight gains, decreased cholesterol and effects on the kidney and blood (NOEL 10 mg/kg). Rats treated 21 days with Halosulfuron-methyl by skin application showed no adverse effects considered related to treatment (NOEL > 1000 mg/kg). The NOEL's in the chronic toxicity studies in rats, mice and dogs were: 2500 ppm and 1000 ppm for males and females in the 2-year rat feeding study, 3000 ppm and 7000 ppm for

males and females in the 18-month mouse feeding study, and 1 mg/kg/day and 10 mg/kg/day for males and females in the 1-year dog capsule study. Treatment-related effects noted in one or more of the chronic studies included decreased weight gain, minor changes in several clinical chemistry and hematology parameters, and histopathological changes of the kidneys, liver and, possibly, thymus and epididymis. Halosulfuron-methyl did not produce tumors in mice or rats following long term (18-24 month) dietary exposures. Developmental toxicity, including resorptions, decreased pup weights and malformations, was observed in the presence of maternal toxicity in rats given Halosulfuron-methyl orally during pregnancy (NOEL 250 mg/kg). Decreased maternal weight gain and an increase in post-implantation loss was seen in rabbits given Halosulfuron-methyl during pregnancy (NOEL 50 mg/kg). Reduced parental and pup weights were noted in male and female rats given Halosulfuron-methyl for two successive generations (NOEL 800 ppm); there were no adverse effects on reproduction or fertility. Halosulfuron-methyl produced no genetic changes in a series of standard tests using animals or animal cells.

**Kaolin Clay (containing < 1% crystalline silica)**

Manage® Turf herbicide contains up to 8-13% kaolin clay. Inhalation of excessive amounts of kaolin dust may produce coughing, sneezing and nasal irritation. Long-term overexposure to kaolin dust may cause respiratory difficulties, such as decreased lung capacity.

**Silica, Hydrated Amorphous**

Manage® Turf herbicide contains less than 3% silica gel (amorphous silica). Inhalation of silica dust can cause drying of mucous membranes of the eyes, nose and throat (due to absorption of moisture and oils) which may result in irritation and occasional nose bleeds. Repeated exposure to silica gel has not been reported to have significant adverse health effects in workers. However, persons with breathing problems or lung disease may be at an increased risk. Laboratory studies in animals exposed by inhalation to silica gel have shown no adverse effects.

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## 12. ECOLOGICAL INFORMATION

None

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## 13. DISPOSAL CONSIDERATIONS ♣

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. Do not reuse container.

Triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

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## 14. TRANSPORT INFORMATION

*Follow the precautions indicated in the Handling and Storage Section, Section 7 of this MSDS.*

DOT Proper Shipping Name: Not Applicable

DOT Hazard Class/I.D. No.: Not Applicable  
DOT Label: Not Applicable  
U.S. Surface Freight Classification: Weed Killing Compound, N.O.I.B.N.

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## 15. REGULATORY INFORMATION

### SARA Hazard Notification:

*Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):*  
immediate, delayed

*Section 313 Toxic Chemical(s):* None

**Hazardous Chemical(s) Under OSHA Hazard Communication Standard (29 CFR 1910.1200):**  
Halosulfuron-methyl, CAS Reg. No. 100784-20-1; Silica, Amorphous Precipitated, CAS Reg. No. 112926-00-8; Kaolin Clay, CAS Reg. No. 1332-58-7; \_ See Section 2 for more info

**Reportable Quantity (RQ) under U.S. CERCLA:** Not Applicable

**TSCA Inventory:** All components are on the US EPA's TSCA Inventory List

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## 16. OTHER ♣

Reasons for revision: Update to conform to changes in EPA approved label language; Technical correction of common name for halosulfuron-methyl; correct typographical errors; correct bulk density; Add sodium sulfite statement

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

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