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

Product identifier
Trade name                  LANDMARK® XP HERBICIDE
Product code (UVP)           84129674
SDS Number                  102000030336
EPA Registration No.         432-1560

Relevant identified uses of the substance or mixture and uses advised against
Use                         Herbicide
Restrictions on use          See product label for restrictions.
Information on supplier
Supplier                    Bayer Environmental Science
                            2 T.W. Alexander Drive
                            Research Triangle PK, NC 27709
                            United States
Email: SDSINFO.BCS-NA@bayer.com

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards
No other hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Component Name</th>
<th>CAS-No.</th>
<th>Concentration % by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SULFOMETURON METHYL</td>
<td>74222-97-2</td>
<td>50.0</td>
</tr>
<tr>
<td>chlorsulfuron</td>
<td>64902-72-3</td>
<td>25.0</td>
</tr>
</tbody>
</table>
SECTION 4: FIRST AID MEASURES

Description of first aid measures

**General advice**
When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

**Inhalation**
Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

**Skin contact**
Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

**Eye contact**
Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

**Ingestion**
Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

**Most important symptoms and effects, both acute and delayed**

**Symptoms**
No symptoms known or expected.

**Indication of any immediate medical attention and special treatment needed**

**Treatment**
Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.

SECTION 5: FIREFIGHTING MEASURES

**Extinguishing media**

**Suitable**
Water spray, Foam, Dry chemical, Carbon dioxide (CO2)

**Unsuitable**
None known.

**Special hazards arising from the substance or mixture**
Accumulation of fine dust may entail the risk of a dust explosion in the presence of air.

**Advice for firefighters**
Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

**Further information**
Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

**Flash point**
not applicable
SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Precautions
Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up
Methods for cleaning up
Avoid dust formation. Use approved industrial vacuum cleaner for removal. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice
Do not allow to enter soil, waterways or waste water canal.

Reference to other sections
Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling
Handle and open container in a manner as to prevent spillage. Avoid dust formation. Use only in area provided with appropriate exhaust ventilation.

Advice on protection against fire and explosion
Avoid dust formation by friction. Dust may form explosive mixture in air. Keep away from heat and sources of ignition.

Hygiene measures
Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers
Store in original container. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>SULFOMETURON METHYL</td>
<td>74222-97-2</td>
<td>5 mg/m³ (TWA)</td>
<td>02 2012</td>
<td>ACGIH</td>
</tr>
<tr>
<td>SULFOMETURON METHYL</td>
<td>74222-97-2</td>
<td>50 µg/m³ (ST ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
</tr>
<tr>
<td>SULFOMETURON METHYL</td>
<td>74222-97-2</td>
<td>5 µg/m³ (AN ESL)</td>
<td>07 2011</td>
<td>TX ESL</td>
</tr>
<tr>
<td>SULFOMETURON METHYL</td>
<td>74222-97-2</td>
<td>3.5 mg/m³ (TWA PEL)</td>
<td>08 2010</td>
<td>US CA OEL</td>
</tr>
</tbody>
</table>

Exposure controls

Personal protective equipment
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection
When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection
Chemical resistant nitrile rubber gloves

Eye protection
Safety glasses with side-shields

Skin and body protection
Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures
Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
light tan

Physical State
solid

Odor
none

Odour Threshold
no data available

pH
no data available

Vapor Pressure
no data available

Vapor Density (Air = 1)
no data available
Evaporation rate: no data available
Boiling Point: not applicable
Melting / Freezing Point: not applicable
Water solubility: dispersible
Minimum Ignition Energy: no data available
Decomposition temperature: no data available
Partition coefficient: n-octanol/water: no data available
Viscosity: not applicable
Flash point: not applicable
Autoignition temperature: no data available
Lower explosion limit: not applicable
Upper explosion limit: not applicable
Explosivity: Dust may form explosive mixture in air.
Dust explosion class: no data available

SECTION 10: STABILITY AND REACTIVITY
Reactivity
Thermal decomposition: no data available
Chemical stability: Stable under normal conditions.
Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.
Conditions to avoid: no data available
Incompatible materials: no data available
Hazardous decomposition products: No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION
Exposure routes: Eye contact, Skin contact, Inhalation, Ingestion
Immediate Effects
Eye: Moderate eye irritation.
Ingestion

Harmful if swallowed.

Information on toxicological effects

Acute oral toxicity

LD50 (rat) > 5,000 mg/kg
The value mentioned relates to the active ingredient sulfometuron methyl.
LD50 (rat) > 2,000 mg/kg
The value mentioned relates to the active ingredient chlorsulfuron.

Acute inhalation toxicity

LC50 (rat) > 5.3 mg/l
Exposure time: 4 h
The value mentioned relates to the active ingredient sulfometuron methyl.
LC50 (rat) > 5.5 mg/l
Exposure time: 4 h
The value mentioned relates to the active ingredient chlorsulfuron.

Acute dermal toxicity

LD50 (rabbit) > 5,000 mg/kg
The value mentioned relates to the active ingredient sulfometuron methyl.
LD50 (rat) > 5,000 mg/kg
The value mentioned relates to the active ingredient chlorsulfuron.

Skin irritation

Mild skin irritation. (rabbit)
The value mentioned relates to the active ingredient sulfometuron methyl.
Mild skin irritation. (rat)
The value mentioned relates to the active ingredient chlorsulfuron.

Eye irritation

Mild eye irritation.
The value mentioned relates to the active ingredient sulfometuron methyl.
Mild eye irritation.
The value mentioned relates to the active ingredient chlorsulfuron.

Sensitisation

Non-sensitizing.
The value mentioned relates to the active ingredient sulfometuron methyl.
Non-sensitizing.
The value mentioned relates to the active ingredient chlorsulfuron.

ACGIH

SULFOMETURON METHYL 74222-97-2 Group A4

NTP
None.

IARC
None.

OSHA
None.
Further information
Only acute toxicity studies have been performed on the formulated product.

### SECTION 12: ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Category</th>
<th>Species</th>
<th>LC50 (mg/l)</th>
<th>Exposure time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toxicity to fish</strong></td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
<td>&gt; 148</td>
<td>96 h</td>
<td>The value mentioned relates to the active ingredient sulfometuron methyl.</td>
</tr>
<tr>
<td></td>
<td>Lepomis macrochirus (Bluegill sunfish)</td>
<td>&gt; 150</td>
<td>96 h</td>
<td>The value mentioned relates to the active ingredient sulfometuron methyl.</td>
</tr>
<tr>
<td></td>
<td>Cyprinodon variegatus (sheepshead minnow)</td>
<td>&gt; 980</td>
<td>96 h</td>
<td>The value mentioned relates to the active ingredient chlorsulfuron.</td>
</tr>
<tr>
<td></td>
<td>Lepomis macrochirus (Bluegill sunfish)</td>
<td>&gt; 0.128</td>
<td>96 h</td>
<td>The value mentioned relates to the active ingredient chlorsulfuron.</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
<td>&gt; 0.122</td>
<td>96 h</td>
<td>The value mentioned relates to the active ingredient chlorsulfuron.</td>
</tr>
<tr>
<td><strong>Toxicity to aquatic invertebrates</strong></td>
<td>Daphnia magna (Water flea)</td>
<td>&gt; 150</td>
<td>48 h</td>
<td>The value mentioned relates to the active ingredient sulfometuron methyl.</td>
</tr>
<tr>
<td></td>
<td>Chlorella vulgaris (Fresh water algae)</td>
<td>0.05</td>
<td>120 h</td>
<td>The value mentioned relates to the active ingredient chlorsulfuron.</td>
</tr>
<tr>
<td><strong>Toxicity to aquatic plants</strong></td>
<td>Anas platyrhynchos (Mallard duck)</td>
<td>&gt; 5,000</td>
<td></td>
<td>The value mentioned relates to the active ingredient sulfometuron methyl.</td>
</tr>
<tr>
<td></td>
<td>Colinus virginianus (Bobwhite quail)</td>
<td>&gt; 5,620</td>
<td></td>
<td>The value mentioned relates to the active ingredient sulfometuron methyl.</td>
</tr>
<tr>
<td><strong>Toxicity to other organisms</strong></td>
<td>Anas platyrhynchos (Mallard duck)</td>
<td>&gt; 5,000</td>
<td></td>
<td>The value mentioned relates to the active ingredient chlorsulfuron.</td>
</tr>
</tbody>
</table>
LD50 (Colinus virginianus (Bobwhite quail)) > 5,620 mg/kg
The value mentioned relates to the active ingredient chlorsulfuron.

Environmental precautions
Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.
Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.
Do not allow to get into surface water, drains and ground water.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods
Product
Do not contaminate water, food, or feed by disposal.
Dispose in accordance with all local, state/provincial and federal regulations.
Follow container label instructions for disposal of wastes generated during use in compliance with the product label.

Contaminated packaging
Do not re-use empty containers.
Triple rinse containers.
Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or incineration, or if allowed by State and Local authorities, by burning.
If burned, stay out of smoke.
Follow advice on product label and/or leaflet.

RCRA Information
Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

According to national and international transport regulations this material is not classified as dangerous goods / hazardous material.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1560
US Federal Regulations None.
TSCA list None.
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D) None.
SARA Title III - Section 302 - Notification and Information None.
SARA Title III - Section 313 - Toxic Chemical Release Reporting
chlorsulfuron 64902-72-3

US States Regulatory Reporting
CA Prop 65
This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients
chlorsulfuron 64902-72-3 NJ, RI

Canadian Regulations
Canadian Domestic Substance List
None.

Environmental
CERCLA
None.

Clean Water Section 307 Priority Pollutants
None.

Safe Drinking Water Act Maximum Contaminant Levels
None.

EPA/FIFRA Information:
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information required on the pesticide label:

Signal word: Caution!

Hazard statements: Harmful if swallowed.
Moderate eye irritation.
Avoid contact with skin, eyes and clothing.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms
49CFR Code of Federal Regulations, Title 49
ACGIH US. ACGIH Threshold Limit Values
CAS-Nr. Chemical Abstracts Service number
EINECS European inventory of existing commercial substances
ELINCS European list of notified chemical substances
IARC US. IARC Monographs on Occupational Exposures to Chemical Agents
IATA International Air Transport Association
IMDG International Maritime Dangerous Goods
N.O.S. Not otherwise specified
NTP US. National Toxicology Program (NTP) Report on Carcinogens
Bayer Environmental Science
SAFETY DATA SHEET

LANDMARK® XP HERBICIDE
Version 2.0 / USA
102000030336

Revision Date: 09/02/2015
Print Date: 09/03/2015

OECD Organization for Economic Co-operation and Development
TDG Transportation of Dangerous Goods
TWA Time weighted average
UN United Nations
WHO World health organisation

**NFPA 704 (National Fire Protection Association):**

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>none</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

**Reason for Revision:** New Safety Data Sheet.

**Revision Date:** 09/02/2015

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.