

# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : 14303-1 Ultra Yield Nu-Bor 10  
**Synonym** : Micronutrient mix  
**Material uses** : Agricultural industry: Soil additive, pesticides, feed additive, etc.  
**Manufacturer** : Agrium Advanced Technologies (U.S.), Inc.  
 2405 West Vassar Road (M-15)  
 Reese, MI 48757  
**Supplier** : Agrium Advanced Technologies (U.S.), Inc.  
 100 Technology Loop  
 Sylacauga, AL 35150  
**Validation date** : Validated by Company on 4/21/2009.

**In case of emergency** : Transportation: 1-800-792-8311  
 Medical: 1-888-670-8123

## 2. Hazards identification

**Physical state** : Solid.  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview** : CAUTION!  
 MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.  
 May be harmful if swallowed. Avoid exposure - obtain special instructions before use. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Wash thoroughly after handling.

### Potential acute health effects

**Inhalation** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.  
**Ingestion** : Nausea, vomiting and diarrhea are common shortly after ingestion.  
**Skin** : May cause skin irritation.  
**Eyes** : May irritate the eyes upon contact.

### Potential chronic health effects

**Chronic effects** : Contains material that may cause target organ damage, based on animal data.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.  
**Target organs** : Contains material which may cause damage to the following organs: lungs, upper respiratory tract, skin, eyes.

### Over-exposure signs/symptoms

**Inhalation** : No specific data.  
**Ingestion** : No specific data.  
**Skin** : No specific data.  
**Eyes** : No specific data.

**Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

## 2 . Hazards identification

See toxicological information (section 11)

## 3 . Composition/information on ingredients

### United States

<u>Name</u>	<u>CAS number</u>	<u>%</u>
magnesium oxide	1309-48-4	7 - 13
boric acid	10043-35-3	1 - 5
boron	7440-42-8	1 - 5
urea	57-13-6	0.99 - 4.98

### Canada

<u>Name</u>	<u>CAS number</u>	<u>%</u>
magnesium oxide	1309-48-4	7 - 13
boric acid	10043-35-3	1 - 5
urea	57-13-6	0.99 - 4.98

### Mexico

<u>Name</u>	<u>CAS number</u>	<u>UN number</u>	<u>%</u>	<u>IDLH</u>	<u>Classification</u>			
					<u>H</u>	<u>F</u>	<u>R</u>	<u>Special</u>
boron	7440-42-8	Not available.	1 - 5	-	1	0	0	
magnesium oxide	1309-48-4	Not available.	7 - 13	750 mg/m <sup>3</sup>	0	0	0	
boric acid	10043-35-3	Not available.	1 - 5	-	0	0	0	

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

## 4 . First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

## 5 . Fire-fighting measures

**Flammability of the product** : No specific fire or explosion hazard.

### Extinguishing media

**Suitable** : Use an extinguishing agent suitable for the surrounding fire.

**Not suitable** : None known.

**Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

## 5 . Fire-fighting measures

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
 carbon dioxide  
 carbon monoxide  
 nitrogen oxides  
 metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods for cleaning up

- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8 . Exposure controls/personal protection

### United States

Ingredient	Exposure limits

## 8 . Exposure controls/personal protection

magnesium oxide	<b>ACGIH TLV (United States, 1/2008).</b> TWA: 10 mg/m <sup>3</sup> 8 hour(s). Form: Fume <b>OSHA PEL (United States, 11/2006).</b> TWA: 15 mg/m <sup>3</sup> 8 hour(s). Form: Total particulates <b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 10 mg/m <sup>3</sup> 8 hour(s). Form: Total particulates <b>ACGIH TLV (United States, 1/2008).</b> TWA: 2 mg/m <sup>3</sup> 8 hour(s). STEL: 6 mg/m <sup>3</sup> 15 minute(s). <b>AIHA WEEL (United States, 1/2008).</b> TWA: 10 mg/m <sup>3</sup> 8 hour(s).
boric acid	
urea	

### Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	
magnesium oxide	US ACGIH 1/2008	-	10	-	-	-	-	-	-	-	[a]
	AB 6/2008	-	10	-	-	-	-	-	-	-	[a]
	BC 6/2008	-	10	-	-	-	-	-	-	-	[b]
magnesium oxide, as Mg	ON 6/2008	-	3	-	-	10	-	-	-	-	[c]
	QC 6/2008	-	10	-	-	-	-	-	-	-	[d]
	US ACGIH 1/2008	-	10	-	-	-	-	-	-	-	[e]
boric acid	BC 6/2008	-	2	-	-	6	-	-	-	-	[f]
	ON 6/2008	-	2	-	-	6	-	-	-	-	[d]
urea	US AIHA 1/2008	-	10	-	-	-	-	-	-	-	

**Form:** [a]Fume [b]Inhalable fume [c]Respirable dust and fume [d]The notation "inhalable" following the name of an agent in this Schedule means that size fraction of the airborne particulate deposited anywhere in the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the American Conference of Governmental Industrial Hygienists (ACGIH) particle size-selective criteria; and (b) has the cut point of 100 microns at 50 per cent collective efficiency. [e]fume [f]Inhalable

### Mexico

Ingredient	Exposure limits
magnesium oxide	<b>NOM-010-STPS (Mexico, 9/2000).</b> LMPE-PPT: 10 mg/m <sup>3</sup> , (as Mg) 8 hour(s). Form: smoke <b>ACGIH TLV (United States, 1/2008).</b> TWA: 2 mg/m <sup>3</sup> 8 hour(s). STEL: 6 mg/m <sup>3</sup> 15 minute(s).
boric acid	

### Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

### Personal protection

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## 8 . Exposure controls/personal protection

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 9 . Physical and chemical properties

**Physical state** : Solid.

## 10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 11 . Toxicological information

### United States

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
boron	LD50 Intraperitoneal	Rat	7 g/kg	-
urea	LD50 Oral	Rat	650 mg/kg	-
	LD50 Intratracheal	Rat	567 mg/kg	-
	LD50 Oral	Rat	8471 mg/kg	-

**Conclusion/Summary** : Not available.

#### Chronic toxicity

**Conclusion/Summary** : Not available.

#### Irritation/Corrosion

**Conclusion/Summary** : Not available.

#### Sensitizer

**Conclusion/Summary** : Not available.

#### Carcinogenicity

**Conclusion/Summary** : Not available.

#### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
magnesium oxide	A4	-	-	-	-	-
boric acid	A4	-	-	-	-	-

## 11 . Toxicological information

### Mutagenicity

Conclusion/Summary : Not available.

### Teratogenicity

Conclusion/Summary : Not available.

### Reproductive toxicity

Conclusion/Summary : Not available.

### Canada

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
urea	LD50 Intratracheal	Rat	567 mg/kg	-
	LD50 Oral	Rat	8471 mg/kg	-

Conclusion/Summary : Not available.

#### Chronic toxicity

Conclusion/Summary : Not available.

#### Irritation/Corrosion

Conclusion/Summary : Not available.

#### Sensitizer

Conclusion/Summary : Not available.

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Conclusion/Summary : Not available.

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magnesium oxide	A4	-	-	-	-	-
boric acid	A4	-	-	-	-	-

### Mutagenicity

Conclusion/Summary : Not available.

### Teratogenicity

Conclusion/Summary : Not available.

### Reproductive toxicity

Conclusion/Summary : Not available.

### Mexico

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
boron	LD50 Intraperitoneal	Rat	7 g/kg	-
	LD50 Oral	Rat	650 mg/kg	-

Conclusion/Summary : Not available.

#### Chronic toxicity

Conclusion/Summary : Not available.

#### Irritation/Corrosion

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Conclusion/Summary : Not available.

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magnesium oxide	A4	-	-	-	-	-
boric acid	A4	-	-	-	-	-

### Mutagenicity

**Conclusion/Summary** : Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

**Conclusion/Summary** : Not available.

## 12 . Ecological information

**Environmental effects** : No known significant effects or critical hazards.

### United States

#### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
urea	-	Acute LC50 66800 to 70500 ug/L Fresh water	Fish - Rohu - Labeo rohita - Egg	96 hours
	-	Acute LC50 22500 ug/L	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
	-	Acute LC50 5000 ug/L Fresh water	Fish - Giant gourami - Colisa fasciata - Fingerling	96 hours

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

### Canada

#### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
urea	-	Acute LC50 66800 to 70500 ug/L Fresh water	Fish - Rohu - Labeo rohita - Egg	96 hours
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	-	Acute LC50 5000 ug/L Fresh water	Fish - Giant gourami - Colisa fasciata - Fingerling	96 hours

## 12 . Ecological information

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

### Mexico

### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

## 13 . Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not available.	Not available.	Not available.	-		-
TDG Classification	Not available.	Not available.	Not available.	-		-
Mexico Classification	Not available.	Not available.	Not available.	-		-

PG\* : Packing group

## 15 . Regulatory information

### United States

**HCS Classification** : Target organ effects

**U.S. Federal regulations** : TSCA 4(a) final test rules: biuret; Urea, reaction products with formaldehyde  
**United States inventory (TSCA 8b)**: Not determined.  
 TSCA 12(b) one-time export: biuret; Urea, reaction products with formaldehyde

## 15 . Regulatory information

**SARA 302/304/311/312 extremely hazardous substances:** No products were found.  
**SARA 302/304 emergency planning and notification:** No products were found.  
**SARA 302/304/311/312 hazardous chemicals:** urea; magnesium oxide; boric acid  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** urea: Immediate (acute) health hazard, Delayed (chronic) health hazard; magnesium oxide: Immediate (acute) health hazard; boric acid: Immediate (acute) health hazard, Delayed (chronic) health hazard  
**Clean Water Act (CWA) 307:** No products were found.  
**Clean Water Act (CWA) 311:** No products were found.  
**Clean Air Act (CAA) 112 accidental release prevention:** No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances:** No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances:** No products were found.

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**State regulations** : **Connecticut Carcinogen Reporting:** None of the components are listed.  
**Connecticut Hazardous Material Survey:** None of the components are listed.  
**Florida substances:** None of the components are listed.  
**Illinois Chemical Safety Act:** None of the components are listed.  
**Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.  
**Louisiana Reporting:** None of the components are listed.  
**Louisiana Spill:** None of the components are listed.  
**Massachusetts Spill:** None of the components are listed.  
**Massachusetts Substances:** The following components are listed: MAGNESIUM OXIDE FUME  
**Michigan Critical Material:** None of the components are listed.  
**Minnesota Hazardous Substances:** None of the components are listed.  
**New Jersey Hazardous Substances:** The following components are listed: MAGNESIUM OXIDE  
**New Jersey Spill:** None of the components are listed.  
**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.  
**New York Acutely Hazardous Substances:** None of the components are listed.  
**New York Toxic Chemical Release Reporting:** None of the components are listed.  
**Pennsylvania RTK Hazardous Substances:** The following components are listed: MAGNESIUM OXIDE (MGO)  
**Rhode Island Hazardous Substances:** None of the components are listed.

**United States inventory (TSCA 8b)** : Not determined.

### Canada

**WHMIS (Canada)** : Class D-2A: Material causing other toxic effects (Very toxic).

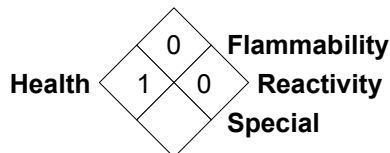
## 15 . Regulatory information

- Canadian lists** : **CEPA Toxic substances:** None of the components are listed.  
**Canadian ARET:** None of the components are listed.  
**Canadian NPRI:** None of the components are listed.  
**Alberta Designated Substances:** None of the components are listed.  
**Ontario Designated Substances:** None of the components are listed.  
**Quebec Designated Substances:** None of the components are listed.
- Canada inventory** : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

### Mexico

**Classification** :



### EU regulations

**Risk phrases** : This product is not classified according to EU legislation.

### International regulations

**International lists** : **Australia inventory (AICS):** All components are listed or exempted.  
**China inventory (IECSC):** Not determined.  
**Japan inventory (ENCS):** Not determined.  
**Japan inventory (ISHL):** Not determined.  
**Korea inventory (KECI):** Not determined.  
**New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.  
**Philippines inventory (PICCS):** Not determined.

**Chemical Weapons Convention List Schedule I Chemicals** : Not listed

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

## 16 . Other information

**Label requirements** : MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

**Hazardous Material Information System (U.S.A.)** :

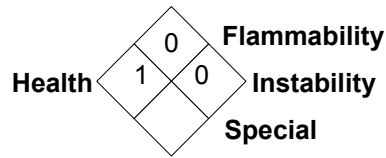
Health	1
Flammability	0
Physical hazards	0

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

## 16 . Other information

The customer is responsible for determining the PPE code for this material. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

National Fire Protection :  
Association (U.S.A.)



Date of issue : 4/21/2009.

Version : 2

☑ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.