1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Identifier:

Product Name: ANFO

Other Means of Identification:

Synonyms: Ammonium Nitrate / Fuel Oil

Proper Shipping Name: Explosive, Blasting, Type B

Recommended Use of the Chemical and Restrictions on Use:

Recommended Use: Mining, quarrying and general blasting explosive

Restrictions on Use: Not for use in reactive ground

Restricted to use only by authorised professionals

Supplier's Details:

Supplier's Name: Nitro Sibir Australia

Address: Suite 3, Level 1, 1 Puccini Court
Stirling WA 6021

Telephone: +61 8 9022 3821

Emergency Telephone Number:

Emergency Number: 1800 884 289 (all hours)

SDS Date: July 2023

2. HAZARDS IDENTIFICATION

Classification of the Substance or Mixture:

Classified as hazardous according to Safe Work Australia: HAZARDOUS CHEMICAL.

Classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Explosives by Road and Rail: DANGEROUS GOODS.

GHS Label Elements, Including Precautionary Statements:

Explosives – Division 1.1
Serious Eye Damage / Irritation – Category 2A
Carcinogenicity – Category 2

Signal Word: Danger

Exploding Bomb

Exclamation Mark

Health Hazard

Hazard Statement(s):
H201: Explosive; mass explosion hazard
H319: Causes serious eye irritation
H351: Suspected of causing cancer

Precautionary Statement(s):

Prevention:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P281: Use personal protective equipment as required.
P210: Keep away from heat/sparks/open flames/surfaces – No Smoking.
P250: Do not subject to grinding/shock/friction.
P264: Wash hands thoroughly after handling.
P280: Wear face protection/protective clothing/eye protection.

Response:
P308+P313: IF exposed or concerned: Get medical advice/attention.
P370+P380: In case of fire: evacuate area.
P372: Explosion risk in case of fire.
P373: DO NOT fight fire when fire reaches explosives.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P378+P313: If eye irritation persists: Get medical advice/attention.

Storage:
P405: Store locked up.
P401: Store in a well-ventilated magazine licensed for Class 1.1D Explosives in accordance with Australian Standard AS2187.1.

Disposal:
P501: Dispose of contents/container in accordance with national/regional/local regulations.

POISONS SCHEDULE (SUSMP): None allocated.

Other Hazards Which do Not Result in Classification:

AUH031: Contact with acids liberates toxic gas.
AUH044: Risk of explosion if heated under confinement.

3. Composition / Information on Ingredients

Ingredient	CAS No	Proportion
Ammonium Nitrate	6484-52-2	>90%
Fuels, Diesel No.2	68476-34-6	<10%
Materials determined not to be hazardous	Not applicable	to 100%

4. First Aid Measures

Description of Necessary First-Aid Measures:

General Advice: For advice, contact a doctor or Poisons Information Centre (131 126).

Inhalation:	Move the victim to fresh air while avoiding becoming a casualty. Loosen restrictive clothing and keep at rest until fully recovered. If breathing is difficult or the patient develops a bluish tinge of the lips and/or skin, ensure airway is clear of any obstruction and allow a qualified person to administer oxygen through a face mask. Apply artificial respiration if patient is not breathing and seek immediate medical advice.
Eye Contact:	In case of eye contact, remove any contact lenses and flush immediately with plenty of water, also under the eyelids, for at least 15 minutes. DO NOT apply any eye ointments or preparations. As with all eye contamination, it is a sensible precaution to seek medical advice.
Skin Contact:	If contact with skin occurs, immediately remove any contaminated clothing and wash area thoroughly with soap and running water. If irritation develops, seek medical attention. Nitrates can be absorbed through cut, burnt or broken skin. Launder contaminated clothing before reuse.
Ingestion:	Immediately rinse mouth with water and drink plenty of water afterwards. If swallowed, DO NOT induce vomiting. Seek medical advice. Never give anything by mouth to an unconscious person. For further advice, call the Poisons Information Centre on 131 126.

Most Important Symptoms/Effects, Acute and Delayed:

Symptoms:	Contact may cause redness and tearing of the eyes.

Indication of Immediate Medical Attention and Special Treatment, if necessary:

Information to Doctor:	This product contains nitrates, which may be reduced to nitrites by intestinal bacteria. Nitrites may affect the blood (methaemoglobinemia) and blood vessels which may result in vasodilation and a fall in blood pressure. Clinical findings: nitrates may have a smooth muscle relaxant effect – can cause headache, dizziness and marked hypotension. Effects peak within 30 minutes. Clinical signs of cyanosis appear before other symptoms because of the dark pigmentation of methaemoglobin. Institute cardiac monitoring, especially in affected persons with coronary, artery or pulmonary disease. Inhalation of decomposition products, possibly including oxides of nitrogen, may cause effects such as difficulty breathing, chest discomfort and pulmonary oedema, which may have a delayed onset. Exposed persons should be kept under medical observation for 24 hours.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Suitable Extinguishing Media:	Do NOT fight fires involving explosives. Evacuate the area immediately to a safe distance.
Unsuitable Extinguishing Media:	Not applicable – DO NOT fight fires involving explosives.

Specific Hazards Arising from the Chemical:

Specific Hazards:	Dangerous when exposed to heat or flames. Can support combustion of other materials involved in fire and is capable of undergoing detonation if heated to high temperatures especially under confinement (including being piled on itself in a burning fire).
Hazards from Combustion Products:	When heated to decomposition, highly toxic fumes may be emitted including oxides of carbon, oxides of nitrogen, ammonia and ammonium nitrate fumes.

Special Protective Actions for Fire Fighters:

Precautions and Special Protective Equipment:	Try to keep fire from reaching explosives. In case of small fire where the actual explosive is not involved, carefully remove explosives to a safe distance, otherwise evacuate area immediately and allow to burn. DO NOT FIGHT EXPLOSIVE FIRES.
HAZCHEM CODE:	E

6. ACCIDENTAL RELEASE MEASURES

Personal Precaution, Protective Equipment and Emergency Procedures:

For Non-Emergency Personnel:	Prior to clean up of a spill, shut off all possible sources of ignition and ensure sufficient ventilation to any confined spaces. Clear the area of all unprotected personnel. In the case of a transport accident notify the Police, Explosives Inspector and Nitro Sibir Australia.
For Emergency Personnel:	Explosive material. Remove all sources of ignition. Use personal protective equipment as required. Ensure adequate ventilation.

Environmental Precautions:

Environmental Precautions:	Contain the source and prevent the spread of the spill to ensure it does not contaminate drains and waterways. Do not flush into surface water or sanitary sewer systems. If contamination of drains or waterways occurs, advise the local emergency services.

Methods and Materials for Containment and Cleaning Up:

Methods for Containment:	Prevent run off into drains and waterways if safe to do so.
Methods for Cleaning Up:	Handle with care. Recover with inert, damp, non-combustible material using clean non-sparking tools and place into properly labelled containers for later disposal. After cleaning, flush away traces with copious amounts of water and ensure contaminated equipment is thoroughly washed. Do not return spilled material to original packaging. Spillage recovery requires appropriate documentation and material to be accurately accounted for.

7. HANDLING AND STORAGE

Precautions for Safe Handling:

Advice for safe handling:	Handle with care. Only properly qualified and authorised personnel should handle and use explosives. Unintended detonation of explosives can cause serious injury or death. Use in designated areas with adequate ventilation. DO NOT subject the material to impact, friction between hard surfaces, or to any form of heating. Avoid all contact with other chemicals. Keep containers closed when not in use. Wear appropriate personal protective equipment to prevent inhalation, skin and eye contact.
General hygiene advice:	Wash hands after use. Do not remove contaminated work clothing from the workplace. Do not get in eyes or on skin. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for Safe Storage, Including any Incompatibilities:

Conditions for safe storage:	Store in a cool, dry, well-ventilated magazine licenced for Class 1.1D explosives. Do not store with other explosive products that have an incompatible explosives hazard classification eg. do not store detonators with blasting/high explosives. Keep storage area free of sources of shock, friction, heat, ignition and combustible materials. Inspect regularly for damage and spills. Protect from physical damage.
Storage incompatibilities:	Store away from strong acids, strong alkalis, chlorates, chlorides, nitrites and permanganates. Ammonium nitrate is not compatible with bromates, chlorate, chlorite, hypochlorite, chloroisocyanurate, dichloroisocyanuric acid, trichloroisocyanuric acid, tetranitromethane and inorganic nitrites.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters:

Exposure Limits: No exposure value has been assigned to this material by Safe Work Australia.

For Constituent:

Fuels, diesel (ACGIH TLV, United States): 8hr TWA – 100mg/ m^3 (measured as total hydrocarbons) inhalable fraction and vapor.

For Decomposition Product:

As published in SafeWork Australia - Workplace Exposure Standards for Airborne Contaminants.

Nitrogen dioxide: 8hr TWA – 5.6mg/m^3 (3ppm), 15min STEL – 9.4mg/m^3 (5ppm)

STEL – Short term exposure limit (STEL) means the time-weighted average maximum airborne concentration of a substance calculated over a 15 minute period.

TWA – 8-hour time-weighted average (TWA) means the maximum average airborne concentration of a substance when calculated over an eight-hour working day, for a five day working week.

Appropriate Engineering Controls:

Engineering Controls: Use only in a well-ventilated area or an area equipped with appropriate exhaust ventilation to ensure air concentrations of components are controlled below workplace exposure standards. Ensure that eyewash stations and safety showers are close to the workstation.

Individual Protection Measures, such as Personal Protective Equipment (PPE):

Individual Protection Measures: All personnel should be removed to a safe location and protected from air blast and fly rock during blasting operations.

The use of PPE should occur when other control measures have been found to be impracticable or when it's use is suitable in conjunction with one or more control measures. A formal risk assessment should be carried out to determine minimum PPE requirements.

Safety glasses with side shields, goggles or full-face shield as appropriate should be used. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection should conform to Australian / New Zealand Standard AS/NZS 1337 – Eye Protectors for Industrial Applications.

Wear gloves of impervious material (PVC or neoprene). Final choice of gloves will vary according to individual circumstances. Reference should be made to Australian / New Zealand Standard AS/NZS 2616.1: – Occupational protective gloves – Selection, use and maintenance.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties and Safety Characteristics:

Physical State:	Small granular spheres, oily to touch
Colour:	Off white or pink
Odour:	Slight fuel odour
Melting/Freezing Point:	No data available
Boiling Point/Boiling Range:	No data available
Flammability:	No data available
Lower and Upper Explosion Limit:	No data available
Flash Point:	>61°C (diesel fuel, No.2)
Auto-ignition Temperature:	No data available
Decomposition Temperature:	No data available
pH:	Not applicable
Kinematic Viscosity:	Not applicable
Solubility (water):	Moderately soluble
Partition Coefficient:	Not applicable
Vapour Pressure:	Not applicable
Relative Density:	0.80 g/cm^3
Relative Vapour Density:	Not applicable
Particle Characteristics:	No data available
Explosive Properties:	Explosive: mass explosive hazard
Further Safety Characteristics:	No information available

10. STABILITY AND REACTIVITY

Reactivity:

Explosive. Reacts with incompatible materials.

Chemical Stability:

Stable under normal conditions of storage and handling. Avoid shock, friction, heat, impact, electrostatic discharge and other sources of ignition. Detonation may occur form heavy impact or excessive heating, particularly under confinement

Possibility of Hazardous Reactions:

Hazardous polymerisation will not occur. A major fire may involve the risk of explosion. An adjacent detonation may also involve the risk of explosive. Heating can cause expansion or decomposition of the material which can lead to containers exploding.

Conditions to Avoid:

Avoid exposure to heat, sources of ignition, static electricity discharge, open flame, shock and friction. Avoid contact with other chemicals including strong acids, alkalis and oxidising agents.

Incompatible Materials:

Incompatible with strong acids, alkalis, combustible materials, permanganates and strong oxidising agents. Ammonium nitrate is a powerful oxidising agent and is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromates, chlorates, chlorites, hypochlorites, perchlorates, permanganates, chloroisocyanurate, nitrites and powdered metals.

Hazardous Decomposition Products:

Thermal decomposition may result in the release of irritating and/or toxic fumes including ammonia and oxides of nitrogen and carbon. When mixed with strong acids, and occasionally during blasting, it produces an irritating toxic brown gas, mostly of nitrogen dioxide. When molten, may decompose violently due to shock or pressure.

11. TOXICOLOGICAL INFORMATION

General Advice:

No adverse health effects are expected if the product is handled in accordance with this Safety Data Sheet and the product label.

Acute Toxicity:

There is no data for this product.

Information on Likely Routes of Exposure:

Skin corrosion / irritation:	Irritating to skin. Skin contact may cause redness, itching and irritation. Repeated or prolonged contact may cause dryness and cracking and may lead to irritant contact dermatitis.
Serious eye damage / irritation:	Exposure may cause irritation, tearing, stinging, blurred vision and redness.
Respiratory or skin sensitisation:	Exposure may cause irritation to the respiratory tract mucous membranes which may result in headaches, dizziness, drowsiness and nausea.
Germ cell mutagenicity:	This material is not classed as a mutagen.
Carcinogenicity:	There is no information available for this material.
Reproductive toxicity:	Not classified as a reproductive toxin.
Specific target organ toxicity (STOT):	**Single exposure** – There is no available information for this material.
Specific target organ toxicity (STOT):	**Repeated exposure** – There is no available information for this material.

Aspiration hazard: This material is not considered an aspiration hazard.

Symptoms Related to the Physical, Chemical and Toxicological Characteristics:

Skin Contact: Prolonged skin contact may defat the skin and cause irritant contact dermatitis. Can be absorbed through cut, broken or burnt skin with resultant adverse effects.

Inhalation: May be irritant to the mucous membranes of the respiratory tract. Inhaling vapour may result in headache, dizziness, drowsiness and nausea.

Delayed and Immediate Effects and Also Chronic Effects from Short and Long Term Exposure:

Skin Contact: Ammonium Nitrate can be absorbed through cut, burnt or broken skin and may cause dilation of blood vessels by direct smooth muscle relaxation and may cause methemoglobinemia.

Numerical Measures of Toxicity:

No information available for product.

Constituent Information:

Ammonium Nitrate: Oral LD50 – 2217mg/kg (rat), Inhalation LC50 - >88.8mg/L (rat) 4h

Diesel Fuel: Oral LD50 – 7500mg/kg (rat), Dermal - >2000mg/kg (rabbit), Inhalation LC50 – 4.6mg/L (rat) 4h

LD50 (Lethal Dose) – the amount of a material, given all at once under control conditions, which causes the death of 50% (one half) of a large number of test animals.

LC50 (Lethal Concentration) – concentration of a material in air that will kill 50% (one half) of test subjects (animals, typically mice or rats) when administered as a single exposure (typically 1 or 4 hours).

Interactive Effects:

No information available.

12. ECOLOGICAL INFORMATION

Exotoxicity:

Harmful to aquatic organisms. May cause long term adverse effects in the aquatic environment. Ammonium nitrate is soluble and a nutrient in water. Spills may cause large algal blooms in static water and may affect the balance of local species populations in the aquatic environment.

The constituent Ammonium Nitrate was evaluated at 5, 10, 25 and 50mg (NH4+)/L. The fertility of Daphnia magna was decreased at 50mg/L. Post embryonic growth of crustacean was impaired at 10, 25 and 50mg/L.

Persistence and Degradability:

There is no available information for this material.

Bioaccumulative Potential:

There is no available information for this material.

Mobility in soil:
There is no available information for this material.

13. DISPOSAL CONSIDERATIONS

Disposal methods:

Destruction of explosives must only be carried out by suitably qualified and licensed personnel. Disposal of material may be undertaken through a licensed waste contractor. If necessary, the relevant Statutory Authorities must be notified. In all circumstances, detonation is the preferred method of disposal.

NOTE: Detonations in loose or stony ground may be expected to cause fly rock. Personnel must be evacuated to a safe distance in accordance with relevant local regulations prior to initiation of the charge.

Small quantities of damaged or deteriorated explosives may be destroyed by inclusion in a blast hole containing good explosive material.

If assistance is required regarding the disposal of waste product, please contact a Nitro Sibir Australia representative.

14. TRANSPORT CONSIDERATIONS

Road and Rail:

Classified as a Class 1 (Explosives) Dangerous Goods according to the Australian Code for the Transport of Explosives by Road and Rail.

UN Number: UN0082

Proper Shipping Name: EXPLOSIVE, BLASTING, TYPE B

Transport Hazard Class: 1.1D

Packing Group: None assigned

Hazchem Code: E

Sea Transport:

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for Transport by Sea

UN Number: UN0082

Proper Shipping Name: EXPLOSIVE, BLASTING, TYPE B

Transport Hazard Class: 1.1D

Packing Group: None assigned

Environmental hazards:	Not a known marine pollutant.
IMDG EMS Fire:	F-B
IMDG EMS Spill:	S-Y
Air transport:	Transport by air is prohibited under the International Air Transport Association (IATA) Dangerous Goods Regulaitons for Transport by Air.
Special precautions for user:	In the event of a transport emergency, treat as an explosive, Class 1.1D, with mass explosion hazard. Refer to Section 6 of this SDS.

15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations Specific for the Product in Question:

Australia:

Classified as dangerous goods in accordance with the Australian Code of Practice for the Transport of Explosives by Road and Rail.

Classified as a hazardous chemical according to the criteria of SafeWork Australia.

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons. Not Scheduled.

All components of this material are listed on the Australian Inventory of Chemical Substances (AICS), or are exempt.

International Agreements:

None applicable.

16. OTHER INFORMATION

Revision Date: July, 2023

Reason(s) for Issue: Minor corrections to formatting.

Abbreviations used:

CAS No	Chemical Abstract Service number (chemical unique identifier)
EMS	Emergency Schedules (procedures for ships carrying dangerous goods)
g/cm^3	grams per cubic centimetre
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
LD50	Lethal Dose, 50%
pH	Scale of acidity from 0 (acidic) to 14 (alkaline), pH 7 is neutral
PPE	Personal Protective Equipment
Ppm	Parts per million
mg/m^3	Milligrams per cubic metre
STEL	Short-term Exposure Limit
STOT	Specific Target Organ Toxicity
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TWA	Time Weighted Average

Key Literature References and Sources of Data:

Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Hazardous Chemical Information System: Safe Work Australia

National Drugs & Poisons Schedule Committee (NDPSC): Standard for the Uniform Scheduling of Medicines and Poisons

National Institute for Occupational Safety and Health

Preparation of Safety Data Sheets for Hazardous Chemicals: Safe Work Australia

Workplace Exposure Standards for Airborne Contaminants: Safe Work Australia

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