

**HAZARDOUS MATERIALS
AWARENESS/OPERATIONS
LEVEL COURSE**



STUDENT HANDOUT

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Disclaimer

This publication is designed to provide information that might be useful during emergency incidents that involve the release or potential release of hazardous materials. It is intended for information purposes only and the reader is expressly cautioned to use any safety precautions and to take appropriate steps to avoid hazards when engaging in activities described herein.

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APPENDIX A

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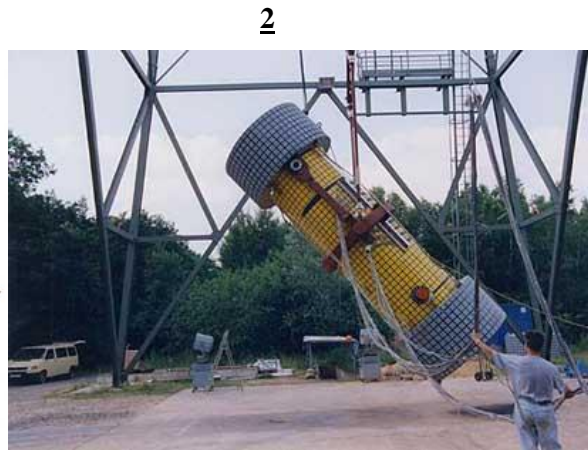
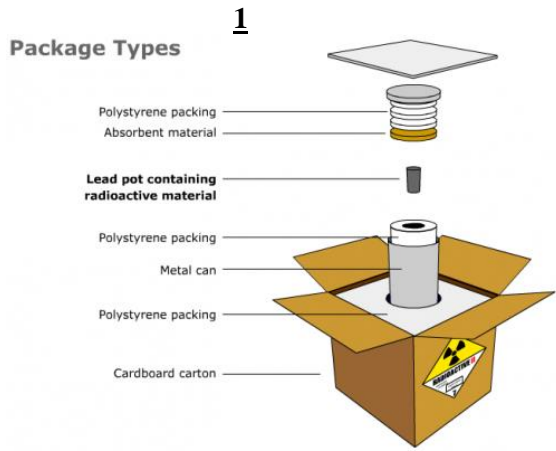
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APPENDIX B



APPENDIX C

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

GROUP

1B

INSECTICIDE

VULCAN®

For control of listed insects infesting certain field, fruit, nut, and vegetable crops.

ACTIVE INGREDIENT

Chlorpyrifos: 0,0-diethyl-0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate 39.50%

OTHER INGREDIENTS*: 60.50%

TOTAL 100.0%

Contains 3.76 pounds of Chlorpyrifos per gallon.

* Contains petroleum distillates.



KEEP OUT OF REACH OF CHILDREN CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand this label, find someone to explain it to you in detail.)

Manufactured for:

Makhteshim Agan of North America, Inc.
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604

How can we help? 1-866-406- 6262

Vulcan is an emulsifiable concentrate (EC) insecticide formulated as part of the Voxien family of products

EPA Reg. No. 66222-233

EPA Est. No. [REDACTED]

NET CONTENTS:

FIRST AID Organophosphate	
IF SWALLOWED:	<ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Do not give any liquid to a person.• Do not induce vomiting unless told to do so by a poison control center or doctor.• Do not give anything by mouth to an unconscious person.
IF IN EYES:	<ul style="list-style-type: none">• 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 poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15-20 minutes.• Call a poison control center or doctor for treatment advice.
IF INHALED:	<ul style="list-style-type: none">• Move person 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 poison control center or doctor for further treatment advice.

HAZARDOUS MATERIALS OPERATIONS

Note to Physician: This product contains an organophosphate that inhibits cholinesterase. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. Contains petroleum distillate. Vomiting may induce aspiration pneumonia.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. For emergency medical treatment information, call Prozar 24 hours a day at 1-877-250-9291.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Mixers and loaders using a mechanical transfer loading system and applicators using aerial application equipment must wear:

- Long-sleeved shirt and long pants
- Shoes and socks
- Protective eyewear

In addition to the above, mixers and loaders using a mechanical transfer loading system must wear:

- Chemical-resistant gloves made of barrier laminate or viton > 14 mils.
- Chemical-resistant apron
- A minimum of a NIOSH approved filtering face piece respirator with any R or P filter (TC-84). You can also use other NIOSH approved particulate respirators that offer more protection, such as a half face or full face respirator with any filter or a powered air purifying respirator with an HE filter.

See **Engineering Control Statement** for additional requirements.

All other mixers, loaders, applicators and handlers must wear:

- Coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves made of barrier laminate or viton > 14 mils.
- Chemical-resistant apron when mixing or loading or exposed to the concentrate
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear for overhead exposure
- A minimum of a NIOSH approved filtering face piece respirator with any R or P filter (TC-84). You can also use other NIOSH approved particulate respirators that offer more protection, such as a half face or full face respirator with any filter or a powered air purifying respirator with an HE filter.

User Safety Requirements

- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.
- Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROL STATEMENT

Mixers and loaders supporting aerial applications must use a mechanical transfer system that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)] for dermal protection, and must:

- Wear the personal protective equipment required above for mixers/loaders
- Wear protective eyewear

Pilots must use an enclosed cockpit in a manner that meets the requirements listed in the WPS for agricultural pesticides [40 CFR 170.240(d)(6)]. Use of human flaggers is prohibited. Mechanical flagging equipment must be used.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the WPS for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

HAZARDOUS MATERIALS OPERATIONS

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish, aquatic invertebrates, small mammals, and birds. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment washwater or rinsate.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are foraging the treatment area. Protective information may be obtained from your cooperative agricultural extension service.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read entire label before using this product. This label must be in the possession of the user at the time of pesticide application.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of:

- **4 days for fruit trees**
- **5 days for citrus**
- **3 days for cauliflower**
- **24 hours for all other crops not listed above**

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls over short sleeved shirt and shirt pants
- Chemical-resistant gloves made of barrier laminate or viton > 14 mils.
- Chemical resistant footwear plus socks
- Chemical Resistant headgear for over head exposures.

Certified crop advisors or persons entering under their direct supervision under certain circumstances may be exempt from the early reentry requirement pursuant to 40 CFR Part 170.

Notify workers of the application by warning them orally and by posting warning signs at entrances to treated areas.

NON AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides [40CFR Part 170]. The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. Keep children, pets and other unprotected persons out of treated area until sprays have dried.

HAZARDOUS MATERIALS OPERATIONS

PRODUCT INFORMATION

Part of the Voxien family of products. Vulcan insecticide forms an emulsion when diluted with water and is suitable for use in all conventional spray equipment. Consult your State Agricultural Experiment Station or State Extension Service for proper timing of applications.

When an adjuvant is to be used with this product, Makhteshim Agan of North America, Inc. suggests the use of a Chemical Producers and Distributors Association certified adjuvant.

USE RESTRICTIONS

Do not formulate this product into other end use products. **Attention:** Do not cut or weld container.

RESISTANCE MANAGEMENT

Vulcan contains a Group 1B insecticide. Insect/mite biotypes with acquired resistance to Group 1B may eventually dominate the insect/mite population if Group 1B insecticides/acaricides are used repeatedly in the same field or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by Vulcan or other Group 1B.

To delay insecticide resistance consider:

- Avoiding the consecutive use of Vulcan or other group 1B insecticides/acaricides that have a similar target site of action, on the same insect/mite species.
- Using tank-mixtures or premixes with insecticides/acaricides from a different target site of action Group as long as the involved products are all registered for the same use and have different sites of action.
- Basing insecticide/acaricide use on a comprehensive IPM program.
- Monitoring treated insect/mite populations for loss of field efficacy.
- Contacting your local extension specialist, certified crop advisors, and/or manufacturer for insecticide/acaricide resistance management and/or IPM recommendations for the specific site and resistant pest problems.

SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator and the grower. The interaction of many equipment-and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions regarding spraying.

Apply only as a medium or coarser spray (ASABE standard 572.1) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles.

Apply only when the wind speed is 2 – 10 mph at the application site.

For ground applications

- Wind speed must be measured adjacent to the application site on the upwind side, immediately prior to application.
- For ground boom applications, apply using a nozzle height of no more than 4 feet above the ground or crop canopy.
- For airblast applications, turn off outward pointing nozzles at row ends and when spraying the outer two rows. To minimize spray loss over the top in orchard applications, spray must be directed into the canopy.

For aerial applications

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or 90% of the rotor blade diameter. Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45°.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the ***Spray Drift Management*** section.

To avoid spray drift, do not apply under windy conditions. Avoid spray overlap as crop injury may result.

Information on Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see ***Wind, Temperature and Humidity and Temperature Inversions*** sections).

APPENDIX D

SAFETY DATA SHEET

Airgas
an Air Liquide company

Ammonia

Section 1. Identification

GHS product identifier	: Ammonia
Chemical name	: ammonia
Other means of identification	: ammonia; Aqueous ammonia; Aqua ammonia; anhydrous ammonia; ammonia solution; Ammonia, anhydrous (I); Ammonia dissolved in water; Gaseous Ammonia; Potassium octanoate; Ammonia,pure,ref.grade; ammonia anhydrous
Product type	: Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	: ammonia; Aqueous ammonia; Aqua ammonia; anhydrous ammonia; ammonia solution; Ammonia, anhydrous (I); Ammonia dissolved in water; Gaseous Ammonia; Potassium octanoate; Ammonia,pure,ref.grade; ammonia anhydrous
SDS #	: 001003
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
24-hour telephone	: 1-866-734-3438

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE GASES - Category 2 GASES UNDER PRESSURE - Liquefied gas ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: Flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.
Harmful if inhaled.
Causes severe skin burns and eye damage.
Very toxic to aquatic life.

Precautionary statements

General

: Read and follow all Safety Data Sheets (SDS'S) before use. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention

: Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing gas. Wash hands thoroughly after handling.

HAZARDOUS MATERIALS OPERATIONS

Section 2. Hazards identification

- Response** : Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
- Storage** : Store locked up. Protect from sunlight. Store in a well-ventilated place.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Hazards not otherwise classified** : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : ammonia
- Other means of identification** : ammonia; Aqueous ammonia; Aqua ammonia; anhydrous ammonia; ammonia solution; Ammonia, anhydrous (I); Ammonia dissolved in water; Gaseous Ammonia; Potassium octanoate; Ammonia,pure,ref.grade; ammonia anhydrous
- Product code** : 001003

CAS number/other identifiers

CAS number : 7664-41-7

Ingredient name	%	CAS number
ammonia	100	7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

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.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. 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.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.

HAZARDOUS MATERIALS OPERATIONS

Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact : Causes serious eye damage.
- Inhalation : Harmful if inhaled.
- Skin contact : Causes severe burns.
- Frostbite : Try to warm up the frozen tissues and seek medical attention.
- Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

- Eye contact : Adverse symptoms may include the following:., pain, watering, redness
- Inhalation : No specific data.
- Skin contact : Adverse symptoms may include the following:., pain or irritation, redness, blistering may occur
- Ingestion : Adverse symptoms may include the following:., stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- 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.
- Specific treatments : No specific treatment.
- Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
nitrogen oxides

Special protective actions for fire-fighters : 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. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

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.

HAZARDOUS MATERIALS OPERATIONS

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

- Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Advice on general occupational hygiene** : 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. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Refer to ANSI/CGA G-2.1, Section 5.13 for electrical classification of anhydrous ammonia storage and handling areas. Where anhydrous ammonia is stored indoors, use electrical (ventilating, lighting and material handling) equipment with the appropriate electrical classification rating and use only non-sparking tools.

HAZARDOUS MATERIALS OPERATIONS

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
ammonia	<p>California PEL for Chemical Contaminants (Table AC-1) (United States). PEL: 25 ppm 8 hours. STEL: 35 ppm 15 minutes.</p> <p>ACGIH TLV (United States, 3/2017). TWA: 25 ppm 8 hours. TWA: 17 mg/m³ 8 hours. STEL: 35 ppm 15 minutes. STEL: 24 mg/m³ 15 minutes.</p> <p>OSHA PEL 1989 (United States, 3/1989). STEL: 35 ppm 15 minutes. STEL: 27 mg/m³ 15 minutes.</p> <p>NIOSH REL (United States, 10/2016). TWA: 25 ppm 10 hours. TWA: 18 mg/m³ 10 hours. STEL: 35 ppm 15 minutes. STEL: 27 mg/m³ 15 minutes.</p> <p>OSHA PEL (United States, 6/2016). TWA: 50 ppm 8 hours. TWA: 35 mg/m³ 8 hours.</p>

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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.

Individual protection measures

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.

Eye/face protection : 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 8. Exposure controls/personal protection

- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. 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.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Gas. [Compressed gas.]
- Color** : Colorless.
- Odor** : Pungent.
- Odor threshold** : Not available.
- pH** : Approx. 11.6
- Melting point** : -77.7°C (-107.9°F)
- Boiling point** : -33°C (-27.4°F)
- Critical temperature** : 132.85°C (271.1°F)
- Flash point** : Not available.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Extremely flammable in the presence of the following materials or conditions: oxidizing materials.
- Lower and upper explosive (flammable) limits** : Lower: 16%
Upper: 25%
- Vapor pressure** : 114.1 (psig)
- Vapor density** : 0.59 (Air = 1)
- Specific Volume (ft³/lb)** : 22.7273
- Gas Density (lb/ft³)** : 0.044
- Relative density** : SPECIFIC GRAVITY (AIR=1): @ 70°F (21.1°C) = 0.59
- Solubility** : Not available
- Solubility in water** : 540 g/l
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : 651°C (1203.8°F)
- Decomposition temperature** : Not available.
- Viscosity** : Not applicable.
- Flow time (ISO 2431)** : Not available.
- Molecular weight** : 17.03 g/mole

Aerosol product

- Heat of combustion** : -18589392 J/kg

Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 10. Stability and reactivity

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
ammonia	LC50 Inhalation Gas.	Rat	7338 ppm	1 hours

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.
Inhalation : Harmful if inhaled.
Skin contact : Causes severe burns.
Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:., pain, watering, redness
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:., pain or irritation, redness, blistering may occur

Section 11. Toxicological information

Ingestion : Adverse symptoms may include the following: , stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
 Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
 Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.
 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.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Other information : IDLH : 300 ppm

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
ammonia	Acute EC50 29.2 mg/l Marine water	Algae - Ulva fasciata - Zoea	96 hours
	Acute LC50 2080 µg/l Fresh water	Crustaceans - Gammarus pulex	48 hours
	Acute LC50 0.53 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 300 µg/l Fresh water	Fish - Hypophthalmichthys nobilis	96 hours
	Chronic NOEC 0.204 mg/l Marine water	Fish - Dicentrarchus labrax	62 days

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.








HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1005	UN1005	UN1005	UN1005	UN1005
UN proper shipping name	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS; OR ANHYDROUS AMMONIA	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS
Transport hazard class(es)	2.2 	2.3 (8)  	2.3 (8) 	2.3 (8)  	2.3 (8) 
Packing group	-	-	-	-	-
Environmental hazards	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Additional information

DOT Classification

: Inhalation hazard
 This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.
Reportable quantity 100 lbs / 45.4 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.
Special provisions 13,T50

TDG Classification

: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).
 The marine pollutant mark is not required when transported by road or rail.
Explosive Limit and Limited Quantity Index 0
ERAP Index 3000
Passenger Carrying Ship Index Forbidden
Passenger Carrying Road or Rail Index Forbidden

HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 14. Transport information

Special provisions

- Mexico Classification** : Toxic Inhalation Hazard Zone D
- IMDG** : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
- IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.
- Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden. Limited Quantities - Passenger Aircraft: Forbidden.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
Clean Water Act (CWA) 311: ammonia

Clean Air Act (CAA) 112 regulated toxic substances: ammonia

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

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
ammonia	100	Yes.	500	-	100	-

SARA 304 RQ : 100 lbs / 45.4 kg

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	ammonia	7664-41-7	100
Supplier notification	ammonia	7664-41-7	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.

HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 15. Regulatory information

New York : This material is listed.
New Jersey : This material is listed.
Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.
Canada : This material is listed or exempted.
China : This material is listed or exempted.
Europe : This material is listed or exempted.
Japan : **Japan inventory (ENCS):** This material is listed or exempted.
Japan inventory (ISHL): This material is listed or exempted.
Malaysia : This material is listed or exempted.
New Zealand : This material is listed or exempted.
Philippines : This material is listed or exempted.
Republic of Korea : This material is listed or exempted.
Taiwan : This material is listed or exempted.
Thailand : Not determined.
Turkey : This material is listed or exempted.
United States : This material is listed or exempted.
Viet Nam : Not determined.

Section 16. Other information

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

Health	/	3
Flammability		1
Physical hazards		2

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 and the associated label are not required on SDSs or products leaving a facility 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 trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

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

HAZARDOUS MATERIALS OPERATIONS

Ammonia

Section 16. Other information



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
FLAMMABLE GASES - Category 2	Expert judgment
GASES UNDER PRESSURE - Liquefied gas	Expert judgment
ACUTE TOXICITY (inhalation) - Category 4	Expert judgment
SKIN CORROSION - Category 1	Expert judgment
SERIOUS EYE DAMAGE - Category 1	Expert judgment
AQUATIC HAZARD (ACUTE) - Category 1	Expert judgment

History

Date of printing : 1/23/2018
Date of issue/Date of revision : 1/23/2018
Date of previous issue : 10/30/2017
Version : 1

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

☑ 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.

HAZARDOUS MATERIALS OPERATIONS

APPENDIX E

SAMPLE SHIPPING PAPER FOR TRAINING USE ONLY

HAZMAT CHEMICAL COMPANY Inc.

AT DEER PARK TX	SHIPPER'S ID NO. 141 A04602	B/L SEQ. NO. 978	CARRIER NAME MATLACK 6189	SHIPPING DATE 11-05-98
FOR CHEMICAL EMERGENCY CALL CHEMTREC DAY OR NIGHT 1-800-424-9300	ROUTE CODE	ROUTE		
CUSTOMER NUMBER 39300001	SEAL NO(S) 88288-90			
CONSIGNEE TO JOHN OGORMAN 1123 DATELOG WAY HOUSTON, TX 77090	BILL TO JPO INDUSTRIES P.O. BOX 90674 HOUSTON, TX 77090	CUSTOMER ORDER NO. 90576 R-4		
ORDERED BY AND DATE MO DAY YR. 11 01 98	SUGGESTED SHIPPING DATE 11 04 98	REQUESTED DELIVERY DATE 11 06 98		
ORDERER'S INITIALS AMH 713-444-2430				

HM	NO. & KIND PACKAGES	PRODUCT NAME	HAZARD CLASS	UN NO.	GUIDE PAGE
X	1 T/T	EPICHLOROHYDRIN,	6.1,	UN 2023,	RQ, GUIDE 131
	LINE 01		4,500	GAL	
	GROSS WT	TARE	NET		
	70,240	25,960	44,280		

SPECIAL INSTRUCTIONS	
<ul style="list-style-type: none"> ANY UNLOADING DETENTION CHANGES BILL TO CONSIGNEE EQUIP. T/T WITH 2" CAMLOCK FITTING for UNLOADING and 2" MALE CAMLOCK FITTING for VENTING DELIVER 10 AM - 3 PM 11/06 	
IF SHIPMENT IS PREPAID MAIL FREIGHT BILL IN DUPLICATE WITH NO. 4 COPY OF B/L TO:	HAZMAT Chemical Company Inc. P.O. Box 1876 Houston, Texas 77251 Attention: Chemical Products Accounting Freight Accounting
SHIPMENTS VIA MOTOR CARRIER	DOT HAZARDOUS MATERIALS PLACARDS FURNISHED BY: <input type="checkbox"/> SHIPPER <input type="checkbox"/> CARRIER
Carrier certifies that the container supplied by Carrier for this shipment is a proper container for transportation of the Materials as described above. Carrier _____ Per Agent _____	DELIVERY RECEIPT - Received in good condition Customer/Customer's Carrier certifies that the container supplied by it for this shipment is a proper container for transportation For _____ By _____

HAZARDOUS MATERIALS OPERATIONS

APPENDIX F

SAMPLE SHIPPING PAPER FOR TRAINING USE ONLY

TRNNB001 ***** Train Documents ***** 06/08/16

10:52:57PT

Train H NTWPAS1 06A Passed RUDYARD MT 06/08/16 1129 2 hr 33 min Late
H NTWPAS1 06

Head End Dyn Dyn Evt Cum Loco Online D E ----Isolated-
Opr

Locos HP AvlHP Brk Brk Rec Axl Tons Dir Destin F M Cd From To

BNSF 5033 4400 4400 8 EF+ Y Y 6 210 WEST PASCO Y
BNSF 7458 4400 4400 8 EF+ Y Y 12 210 EAST PASCO Y DB NORTH
WILLMA

Total 8800 8800 12 420
Incl DPUs 13200 13200 Actual HPT = 1.3 (13200 HP/9728 tons)
Scheduled HpT = 3.0

Seq Car L Contents Online J Grs Final Dest
Cum N
Num Init Number Knd E Want Dy Destin T RAJP Ton Consignee City ST
Axl A

Block PAS Setout PASCO WA
1 UCRY 873077 FI8 L WDPROD KENTWA 130 VANDERFORPRO KENT WA
16
2 CSS 1745 GRS L COILS PORSIX 121 OREGONMETS LI PORTERSIX OR
20
3 SAMX 11586 CXW L GRNPRD TACOMA TMBL 140 MACMILLANPIP TACOMA WA
36
7 NATX 302273 T5I L HAZMAT ESTJOH PNWR 130 PORTLAWRR LINNTON OR
40

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

1 TK // 191029 LB
* HAZMAT * UN1987 // ALCOHOLS, N.O.S.

(ALCOHOLS, N.O.S.)

EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC

HAZMAT STCC 4909152
RAIL CONSIGNEE RAIL SHIPPER
CARSON OIL COMPANY INC RPMG INC
1157 VALLEY PARK DRIVE SUITE 1
LINNTON OR 55379 BENSON MN

8 TILX 198499 T5I L HAZMAT ESTJOH PNWR 128 PORTLAWRR LINNTON OR
44

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

1 TK // 190368 LB
* HAZMAT * UN1987 // ALCOHOLS, N.O.S.

(ALCOHOLS, N.O.S.)

EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC

HAZMAT STCC 4909152

HAZARDOUS MATERIALS OPERATIONS

9 GBRX 700039 T5I L HAZMAT ESTJOH PNWR 130 PORTLAWRR LINNTON OR
48

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

* HAZMAT * 1 TK // 189039 LB
***** UN1987 // ALCOHOLS, N.O.S.
***** (ALCOHOLS, N.O.S.)
3
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC
HAZMAT STCC 4909152

RAIL CONSIGNEE RAIL SHIPPER
CARSON OIL COMPANY INC RPMG INC
1157 VALLEY PARK DRIVE SUITE 1
LINNTON OR 55379 BENSON MN

10 TILX 191288 T5I L HAZMAT ESTJOH PNWR 129 PORTLAWRR LINNTON OR
52

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

* HAZMAT * 1 TK // 191035 LB
***** UN1987 // ALCOHOLS, N.O.S.
***** (ALCOHOLS, N.O.S.)
3
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC
HAZMAT STCC 4909152

RAIL CONSIGNEE RAIL SHIPPER
CARSON OIL COMPANY INC RPMG INC
1157 VALLEY PARK DRIVE SUITE 1
LINNTON OR 55379 BENSON MN

11 TILX 190545 T5I L HAZMAT ESTJOH PNWR 128 PORTLAWRR LINNTON OR
56

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

* HAZMAT * 1 TK // 190361 LB
***** UN1987 // ALCOHOLS, N.O.S.
***** (ALCOHOLS, N.O.S.)
3
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC
HAZMAT STCC 4909152

RAIL CONSIGNEE RAIL SHIPPER
CARSON OIL COMPANY INC RPMG INC
1157 VALLEY PARK DRIVE SUITE 1
LINNTON OR 55379 BENSON MN

12 TILX 191306 T5I L HAZMAT ESTJOH PNWR 129 PORTLAWRR LINNTON OR
60

FL FLAMMABLE

>>> KEY SHIPMENT (TWENTY) <<<

HAZARDOUS MATERIALS OPERATIONS

RAIL CONSIGNEE RAIL SHIPPER
CARSON OIL COMPANY INC RPMG INC
1157 VALLEY PARK DRIVE SUITE 1
LINNNTON OR 55379 BENSON MN
13 TAEX 2230 T5I L HAZMAT EPASCO 127 TIDEWATERMIN EPASCO WA

* HAZMAT * UN1814 // POTASSIUM HYDROXIDE,
***** SOLUTION
8
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: ERCO WORLDWIDE USA INC
RQ (POTASSIUM HYDROXIDE)
HAZMAT STCC 4935230

RAIL CONSIGNEE RAIL SHIPPER
TESORO REFINING AND MARKETING RPMG INC
19100 RIDGEWAY PKWY
PASCO WA 78259 BENSON MN
14 TILX 191189 T5I L HAZMAT EPASCO 130 TIDEWATERMIN EPASCO WA
68
FL FLAMMABLE
>>> KEY SHIPMENT (TWENTY) <<<

* HAZMAT * UN1987 // ALCOHOLS, N.O.S.
***** (ALCOHOLS, N.O.S.)
3
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC
HAZMAT STCC 4909152

RAIL CONSIGNEE RAIL SHIPPER
TESORO REFINING AND MARKETING RPMG INC
19100 RIDGEWAY PKWY
PASCO WA 78259 BENSON MN
15 NATX 302145 T5I L HAZMAT EPASCO 129 TIDEWATERMIN EPASCO WA
72
FL FLAMMABLE
>>> KEY SHIPMENT (TWENTY) <<<

* HAZMAT * UN1987 // ALCOHOLS, N.O.S.
***** (ALCOHOLS, N.O.S.)
3
EMERGENCY CONTACT: 8004249300 PG II
SHIPPER CONTACT: RPMG INC
HAZMAT STCC 4909152

HAZARDOUS MATERIALS OPERATIONS

Train Totals 124 Cars 58 Loads 66 Empties 9728 Tons 8030 Feet
 (124 Railcars) 78.5 TOB Avg 219 Loco
 0 RSSM Car Count 8249 Total

Haz Totals:

Haz Railcars 18 Cars 18 Loads 0 Empties 2317 Tons 1048 Feet

Haz Containers - 0 Haz Vans - 0

CLASSIFICATION: (FLAMMABLE LIQUID)

COMMODITY NUMBER IS: 4909152

UNNA IS: UN1987

DENATURED ALCOHOL (ALCOHOLS, N.O.S.)

(FLAMMABLE LIQUID)

CLASS 3 (FLAMMABLE LIQUID)

UN1987

(FLAMMABLE LIQUID)

DENATURED ALCOHOL IS A CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC ODOR. IT HAS A FLASH POINT NEAR 55 DEG. F. IT IS LIGHTER THAN WATER AND SOLUBLE IN WATER. ITS VAPORS ARE HEAVIER THAN AIR. IT IS USED AS A FUEL, SOLVENT, ANTIFREEZE, AND TO MAKE OTHER CHEMICALS.

IF MATERIAL ON FIRE OR INVOLVED IN FIRE

DO NOT EXTINGUISH FIRE UNLESS FLOW CAN BE STOPPED

USE WATER IN FLOODING QUANTITIES AS FOG

SOLID STREAMS OF WATER MAY BE INEFFECTIVE

COOL ALL AFFECTED CONTAINERS WITH FLOODING QUANTITIES OF WATER

APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE

USE ""ALCOHOL"" FOAM, DRY CHEMICAL OR CARBON DIOXIDE

IF MATERIAL NOT ON FIRE OR NOT INVOLVED IN FIRE

KEEP SPARKS, FLAMES, AND OTHER SOURCES OF IGNITION AWAY

KEEP MATERIAL OUT OF WATER SOURCES AND SEWERS

BUILD DIKES TO CONTAIN FLOW AS NECESSARY

ATTEMPT TO STOP LEAK IF WITHOUT UNDUE PERSONNEL HAZARD

USE WATER SPRAY TO KNOCK-DOWN VAPORS

PERSONNEL PROTECTION

WEAR APPROPRIATE CHEMICAL PROTECTIVE GLOVES, BOOTS AND GOGGLES

WASH AWAY ANY MATERIAL WHICH MAY HAVE CONTACTED THE BODY

WITH COPIOUS AMOUNTS OF WATER OR SOAP AND WATER

FIRST AID RESPONSES

MOVE VICTIM TO FRESH AIR; SEEK MEDICAL ATTENTION IMMEDIATELY.

IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION.

REMOVE AND ISOLATE CONTAMINATED CLOTHING AND SHOES AT THE SITE.

IN CASE OF CONTACT WITH MATERIAL, IMMEDIATELY FLUSH SKIN OR EYES WITH

RUNNING WATER FOR AT LEAST 20 MINUTES. REMOVE CONTACT LENSES IMMEDIATELY.

KEEP VICTIM QUIET AND MAINTAIN NORMAL BODY TEMPERATURE.

EFFECTS MAY BE DELAYED, KEEP VICTIM UNDER OBSERVATION.

ENVIRONMENTAL CONSIDERATIONS - AIR SPILL

APPLY WATER SPRAY OR MIST TO KNOCK DOWN VAPORS

ENVIRONMENTAL CONSIDERATIONS - LAND SPILL

DIG A PIT, POND, LAGOON, HOLDING AREA

TO CONTAIN LIQUID OR SOLID MATERIAL

COVER SOLIDS WITH A PLASTIC SHEET

TO PREVENT DISSOLVING IN RAIN OR FIRE FIGHTING WATER

DIKE SURFACE FLOW USING SOIL, SAND BAGS,

FOAMED POLYURETHANE, OR FOAMED CONCRETE

ENVIRONMENTAL CONSIDERATIONS - WATER SPILL

USE NATURAL BARRIERS OR OIL SPILL CONTROL BOOMS TO LIMIT SPILL TRAVEL

HAZARDOUS MATERIALS OPERATIONS

55 CARS FROM HEAD END UTLX630403

CLASSIFICATION: (CORROSIVE MATERIAL)

COMMODITY NUMBER IS: 4935230

UNNA IS: UN1814

POTASSIUM HYDROXIDE, SOLUTION

(CORROSIVE MATERIAL)

CLASS 8 (CORROSIVE MATERIAL)

UN1814

(CORROSIVE MATERIAL)

ENVIRONMENTALLY HAZARDOUS SUBSTANCE (RQ-

1000 POUNDS (454 KILOGRAMS))

(CORROSIVE MATERIAL)

POTASSIUM HYDROXIDE, SOLUTION IS THE WATER SOLUTION OF A WHITE SOLID. THE CONCENTRATED SOLUTION WILL DISSOLVE IN ADDITIONAL WATER WITH EVOLUTION OF HEAT. IT IS CORROSIVE TO METALS AND TISSUE. IT WEIGHS 12.8 LBS./GAL. IT IS USED TO MAKE SOAPS, OTHER POTASSIUM COMPOUNDS, IN LIQUID FERTILIZERS, AND FOR MANY OTHER USES.

IF MATERIAL ON FIRE OR INVOLVED IN FIRE

SOLID STREAMS OF WATER MAY BE INEFFECTIVE

EXTINGUISH FIRE USING AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE

USE WATER IN FLOODING QUANTITIES AS FOG

APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE

IF MATERIAL NOT ON FIRE OR NOT INVOLVED IN FIRE

KEEP MATERIAL OUT OF WATER SOURCES AND SEWERS

BUILD DIKES TO CONTAIN FLOW AS NECESSARY

PERSONNEL PROTECTION

AVOID BODILY CONTACT WITH THE MATERIAL

WEAR APPROPRIATE CHEMICAL PROTECTIVE GLOVES, BOOTS AND GOGGLES

DO NOT HANDLE BROKEN PACKAGES UNLESS WEARING

APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT

WITH COPIOUS AMOUNTS OF WATER OR SOAP AND WATER

IF CONTACT WITH THE MATERIAL ANTICIPATED,

WEAR APPROPRIATE CHEMICAL PROTECTIVE CLOTHING

FIRST AID RESPONSES

MOVE VICTIM TO FRESH AIR; SEEK MEDICAL ATTENTION IMMEDIATELY.

REMOVE AND ISOLATE CONTAMINATED CLOTHING AND SHOES AT THE SITE.

IN CASE OF CONTACT WITH MATERIAL, IMMEDIATELY FLUSH SKIN OR EYES WITH

RUNNING WATER FOR AT LEAST 20 MINUTES. REMOVE CONTACT LENSES IMMEDIATELY.

KEEP VICTIM QUIET AND MAINTAIN NORMAL BODY TEMPERATURE.

ENVIRONMENTAL CONSIDERATIONS - AIR SPILL

APPLY WATER SPRAY OR MIST TO KNOCK DOWN VAPORS

ENVIRONMENTAL CONSIDERATIONS - LAND SPILL

DIG A PIT, POND, LAGOON, HOLDING AREA

TO CONTAIN LIQUID OR SOLID MATERIAL

DIKE SURFACE FLOW USING SOIL, SAND BAGS,

FOAMED POLYURETHANE, OR FOAMED CONCRETE

ENVIRONMENTAL CONSIDERATIONS - WATER SPILL

NEUTRALIZE WITH DILUTE ACID

COMPATIBLE PROTECTIVE EQUIPMENT CONSTRUCTION MATERIALS INCLUDE:

NITRILE RUBBER/POLYVINYL CHLORIDE

POLYURETHANE

POLYVINYL CHLORIDE

STYRENE-BUTADINE RUBBER

.... END OF REPORT

HAZARDOUS MATERIALS OPERATIONS

APPENDIX G

SAMPLE SHIPPING PAPER FOR TRAINING USE ONLY

*** ATTACHED SHEET ***
OF DECLARATION OF DANGEROUS GOODS

2017/02/20
F-4

DEST CODE 104U HAISEN CTL NO P051 VESSEL NAME GEORGE WASHINGTON BRIDGE
SAILING ON OR ABOUT 20170222 FROM NAGOYA, JAPAN
IMO CLASS: 9 UN-NO: 3090 LABEL: 9 Pg: 11

TOYDPO51

CONTAINER NO	GOODS	QTY	PCS	M/W(KGS)	B/W(KGS)	M3
BSIU9635752	BATTERY HAYDAY	1	48	10.00	12.00	0.042
BSIU9692205	BATTERY HAYDAY	1	96	20.20	23.90	0.082
KKFU7829358	BATTERY HAYDAY	1	144	30.30	36.10	0.133
KKFU7925490	BATTERY HAYDAY	1	48	10.10	11.30	0.043
KKFU7927908	BATTERY HAYDAY	1	96	20.10	23.40	0.084
KKFU7943215	BATTERY HAYDAY	1	144	30.20	35.20	0.123
KKFU8102820	BATTERY HAYDAY	1	96	20.10	23.60	0.085
TCLU4477961	BATTERY HAYDAY	1	48	10.10	11.80	0.042
TCNU4416624	BATTERY HAYDAY	1	144	30.20	35.30	0.123
TCNU9526268	BATTERY HAYDAY	1	96	20.20	24.20	0.081
TOTAL	BATTERY HAYDAY	12	960	201.50	237.00	0.862

危険物明細書
DECLARATION OF DANGEROUS GOODS FOR MULTIMODAL TRANSPORT

コンテナ危険物明細書
DECLARATION OF DANGEROUS GOODS IN CONTAINER & CONTAINER PACKING CERTIFICATE FOR MULTIMODAL TRANSPORT

MESSRS: _____ 社名

Date. (日付) _____

TOYDPO

This summarizes the requirements of ICAO Annex 18, regulation 8.2; MARPOL 73/78, Annex II, regulation 1 and the IMDG Code chapter 5.4

発出者の氏名又は名称及び住所: Shipper / Consignor / Sender TOYOTA MOTOR CORPORATION 1, TOYOTA-CHO, TOYOTA, AICHI, JAPAN		1 ブッキング番号: Booking No. NATDP051 2	
荷受人の氏名又は名称及び住所: Consignee TOYOTA MOTOR MANUFACTURING KENTUCKY, INC. 1001 CHERRY BLOSSOM WAY GEORGETOWN, KENTUCKY 40324		Page 1 of 3 4 4 発出者固有番号: Shipper's reference number(s) 5 荷物運送票固有番号: Freight forwarder's reference number(s) 7 発出者/船積の責任会社名: Carrier / 運送人の記入 (to be completed by the carrier) K'LINE	
以下の危険物の詳細・包装、積上げ及び積卸しは危険物の輸送及び付属規則に適合し、かつ、全ての面に於て適切に標識された状態であることを証明します。 SHIPPER'S DECLARATION I hereby declare that the contents of this consignment are fully and accurately described by the proper shipping name, and are classified, packaged, marked and labelled / placarded and are in all respects in proper condition for transport according to the applicable international and national governmental regulations.		8 発出者の氏名、職名、所属: Name / status company / organization of signatory TOYOTA MOTOR CORPORATION K.YAMAMOTO MANAGER 署名の場所及び日付: Place and date 21-Feb-2017 NAGOYA, JAPAN 9 発出者の署名: Signature on behalf of shipper 	
10 船名、航路番号及び船積予定日: Vessel/flight No./Voy No. and date GEORGE WASHINGTON BRIDGE Voy No. 086E 22-Feb-2017 11 積込地: Port/place of loading NAGOYA, JAPAN		12 積出地: Port/place of discharge TACOMA 13 積込地: Destination GEORGETOWN, KY, USA 14 予防処置、保護具、応急処置用品: Prevention Measures, Protection equipment, EMS code No., Medical First Aid or MFAG table No. MFAG table No.: See IMO MFAG, EMS No.: P-A, 9-1 緊急連絡先: Emergency contact (国番号を含む電話番号) CHEMTREC (CCN22632): *AS SEE BELOW 15 特記事項: Additional handling information * International 24-Hour Number: 1-703-627-3887 US & Canada 24-Hour Number: 1-800-424-5300	
16 荷役記号: Shipping marks & number(s)		17 危険物の説明: *Description of dangerous goods. The basic description should be in order to UN number, proper shipping name, class, Compatibility group (for Class 1) Substituted hazard class (where assigned) and packing group (where assigned). 基本記号(UN番号、品名、クラス、包装区分(クラスの場合))、副記号(危険性等級(適用する場合))及び包装等級(適用する場合))の順に記載されなければならない。 18 数量: Numbered list of packages, Gross mass(kg) Net mass(kg) Chtc(m3)	
19 UN番号(UN番号) UN 3090 20 危険物の名称(品名) LITHIUM METAL BATTERIES (including lithium alloy batteries) 21 クラス(クラス) CLASS 9 22 副危険物クラス(副危険物クラス) 23 包装区分(包装区分) 24 包装グループ(包装グループ) 25 追加説明(追加説明) "FLASH POINT" "MARINE POLLUTANT" etc. OTHER: 副記号(危険性等級)及び包装等級(適用する場合)の順に記載されなければならない。		26 包装区分: Total gross (including tare) (kg) 27 包装区分: Total gross (including tare) (kg) 28 包装区分: Total gross (including tare) (kg) 29 包装区分: Total gross (including tare) (kg)	
30 容器番号: Container No. 31 積込番号: Seal No. 32 危険物/車両の種別: Container / vehicle size & type 33 危険物/車両の種別: Container / vehicle size & type 34 総重量: Total gross (including tare) (kg)		35 総重量: Total gross (including tare) (kg)	

AS PER ATTACHED SHEET

APPENDIX H

SAMPLE SHIPPING PAPER FOR TRAINING USE ONLY

Sender's Copy

Form ID No. **0200**

1 From Please print and press hard.
Date _____ Sender's FedEx Account Number _____
Sender's Name _____
Company _____
Address _____
City _____ State _____ ZIP _____
Dept./Floor/Room _____

2 Your Internal Billing Reference
First 24 characters will appear on invoice.

3 To
Recipient's Name _____
Company _____
Recipient's Address _____
Address _____
City _____ State _____ ZIP _____
Dept./Floor/Room _____

4a Express Package Service
 FedEx Priority Overnight Next business morning*
 FedEx Standard Overnight Next business afternoon*
 FedEx 2Day Second business day*
 FedEx Express Saver Third business day*
4b Express Freight Service
 FedEx 1Day Freight Next business day*
 FedEx 2Day Freight Second business day*
 FedEx 3Day Freight Third business day*
* Call for Confirmation.

5 Packaging
 FedEx Envelope*
 FedEx Pak*
 FedEx Tube
 Other
* Declared value less than \$500.

6 Special Handling
 SATURDAY Delivery Available DAILY for FedEx 1Day Overnight and FedEx 2Day Freight to select ZIP codes.
 HOLD Saturday at FedEx Location. Available ONLY for FedEx 1Day Overnight and FedEx 2Day Freight to select locations.
Does this shipment contain dangerous goods?
 No Yes (See instructions for classifying dangerous goods including Dry Ice containers shipped in FedEx packaging.)
 No Yes (See instructions for classifying dangerous goods including Dry Ice containers shipped in FedEx packaging.)
 Dry Ice Dry Ice UN 1845 Cargo Aircraft Only

7 Payment Bill to: Sender Recipient Third Party Credit Card Cash/Check
FedEx Account No. _____
Credit Card No. _____
Total Packages _____ Total Weight _____ Total Declared Value* \$ _____
* Your liability is limited to \$100 unless you declare a higher value. See back for details. FedEx Use Only.

8 Sign to Authorize Delivery Without a Signature
By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
Rev. Date 11/03/04 FedEx Form 0200 FedEx Form 0200 U.S.A. MAIL SA. 467

Try online shipping at fedex.com.
By using this Airbill you agree to the terms and conditions on the back of this Airbill and in our current Service Guide.
Questions? Visit our Web site at fedex.com
or call 1.800.GOOD.FEDX 1.800.463.3338.

Dangerous Goods in Excepted Quantities

847096588010

FedEx Tracking Number

0200

Include this statement and check this box.

HAZARDOUS MATERIALS OPERATIONS

APPENDIX I

Answer Key for Test A

- 1- D
- 2- P
- 3- F
- 4- L
- 5- H
- 6- O
- 7- M
- 8- B
- 9- I
- 10- R
- 11- Q
- 12- G
- 13- C
- 14- N
- 15- E
- 16- K
- 17- A
- 18- J

Answer Key for Test B

- 1- B
- 2- A
- 3- D
- 4- C

Answer Key for Test E

- 1 - D (Pg. 8)
- 2 - B (Pg. 12)
- 3 - B (Pg. 8)
- 4 - A (Pg. 9)
- 5 - B (Pg. 19)
- 6 - B (Pg. 25)
- 7 - B (Pg. 137)
- 8 - C (Pg. 323)
- 9 - C (Pg. 176)
- 10 - C (Pg. 209)
- 11 - A (Pg. 280)
- 12 - A (Pg. 300)
- 13 - A (Pg. 357)
- 14 - C (Pg. 369)
- 15 - A (Pg. 374)
- 16 - A (Pg. 383)
- 17 - A (Pg. 392)
- 18 - C (Pg. 384)
- 19 - C (Pg. 397)

HAZARDOUS MATERIALS OPERATIONS

APPENDIX J

Discussion #1

The doorbell rings at your station and you are greeted by an older gentleman that said he found a jerrycan of an unknown product. He has it in the bed of his truck and he said whatever is in it smells oily and looks brown. He wants to give it to the fire department. What do you do or tell him?

- 5 minutes

Discussion #2

There are many ways to identify a hazardous material is present: DOT placards, NFPA 704 placards, shipping papers, SDS, pesticide labels, container identification, senses, etc. Out of all the available methods, is there one that is better? Is there one that is inefficient?

- 5 minutes

Discussion #3

Complete the 2016 ERG test

- 40 minutes

Discussion #4

Discuss the process of Ludwig Benner Jr.'s model from the last video and explain what you would do different based on the knowledge of container failures as chemical & physical properties

- 10 minutes

Discussion #5

Explain how the IMS works for a 1 car MVA with an Engine (3 Personnel) and a Medic unit responding. Who is in charge of the Command Positions? (CFLOP)? Is there a Safety Officer? Compare this incident to a large scale train derailment requiring two divisions (North & South) as well as a Hazmat section. Where would the Hazmat section be placed within a NIMS framework in this type of incident.

- 10 minutes

Discussion #6

Analyze the incident as the Ghent video plays. What were the main factors to this incident? How should have this incident been conducted? How does it compare to a broken natural gas meter alongside the same business?

- 10 minutes

Discussion #7

You respond to an unknown white powder incident. This call is at 10AM on a Sunday on a sidewalk in front of a local grocery store. An older female was walking in to go shopping and noticed a white powder outside and felt it important to call someone. You arrive to find a few grams of a white substance in a bag, with a discolored soda can in the bushes next to the sidewalk. What are your actions?

You are called out to another white powder incident during the next shift. This is at the local planned parenthood. The security agent says he picked up an addressed envelope to the facility and noticed a powdery substance fall out of the cracks. He now feels minor burning on his hands where the powder contacted his skin. What are your actions this time?

- 10 minutes

HAZARDOUS MATERIALS OPERATIONS

Discussion #8

The product UN 1969 has three different forms of PPE listed in the ERG. Why are none of them perfect protection? How does this differ against UN 1005? What PPE is proper for each product?

- 10 minutes

Discussion #9

You are dispatched to an industrial park after a truck driver has been contaminated by a product. You arrive and find a man sitting in obvious distress about 150 feet away from an MC331 that is not leaking with a placard of 1079. The cargo tank is next to multiple one ton cylinders with loading hoses on the ground. The driver states he was working on transferring product from his truck to the cylinder and the product sprayed out onto his arm. He shut the valve and ran away, He has respiratory distress, burning eyes, and visible frostbite on his fingers. What form of decon are you going to do? What about patient privacy? What actions must be taken at the Hospital?

- 10 minutes

Discussion #10

Your Engine crew arrives on a car that drove off a curb after leaving a gas station and is currently leaking gasoline out of its tank. You see a stream of gasoline slowly heading to a drain on the street. What are your actions?

- 10 minutes

Discussion #11

You are dispatched to a CO alarm at a local apartment complex. Upon arrival you find 3 occupants standing outside of unit 106 of a 3 story building. You can hear an alarm beeping inside the unit. Medics checked the 3 occupants and found that one had 9.3% CO in their bloodstream. The other two occupants had minimal readings, and all three weren't experiencing any symptoms. What PPE do you need for this investigation? What equipment? What will you do if the CO sensor goes into alarm (42PPM)?

- 10 minutes

Discussion #12

You are dispatched to an explosion with fire at a residence. Upon arrival you find light smoke showing at a house, with the front door of the house blown into the street. As you are getting ready to perform offensive fire operations from the Alpha side, a resident stumbles out of the house and tells you his weed is all gone, and his buddy is somewhere in there. You make entry and find minor spot fires, evidence of a gas explosion, marijuana plants, butane, and a 20s YOM lying in the living room with severe burns to his arms & face, he is in obvious pain. How to you get the occupant in the house to proper medical care? What else needs to occur to this patient prior to him going to the hospital? What are your actions for the house? What other agencies will be involved in this event?

- 10 minutes

HAZARDOUS MATERIALS OPERATIONS

APPENDIX K

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