SAFETY DATA SHEET

1. Product and Company Identification

Product identifier **Propane**

Other means of identification Not available

Recommended use Fuel

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name MAVERICK NATURAL RESOURCES, LLC

Address
(Parent of Breitburn Operating LP)
5415 Oil Plant Road
P.O. Box 889
Jay, FL 32565
United States

Telephone Phone: (850) 675-1755 or
Phone: (850) 675-1704

E-mail Not available.

Emergency phone number CHEMTREC: (800) 424-9300

2. Hazards Identification

Physical hazards Flammable gases — Category 1
Gases under pressure — Liquefied gas

Health hazards Not classified.

Environmental hazards Not classified.

OSHA defined hazards Simple asphyxiant

Label elements

Signal word Danger

Hazard statement Extremely flammable gas. Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

Precautionary statement

Prevention Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Keep container tightly closed. Wear respiratory protection. Use only outdoors or in a well-ventilated area.

Response Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage Store in a well-ventilated place. Protect from sunlight.

Disposal Dispose of container in accordance with local, regional, national and international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/Information on Ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Propane		74-98-6	98-100
Butane		106-97-8	0.1-2
Ethyl mercaptan		75-08-1	0.01-0.1

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Inhalation	Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory tract irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.
Skin contact	Contact with liquid may cause frostbite. Briefly flush the affected area with lukewarm, gently flowing water until the chemical is removed. Do not attempt to re-warm the affected area. Do not rub the affected area or apply dry heat. Carefully cut around clothing that sticks to the skin and remove the remainder of the garment. Loosely cover the affected area with a sterile dressing. Do not permit affected person to drink alcohol or smoke. Quickly transport affected person to an emergency medical facility.
Eye contact	Flush eye with lukewarm, gently flowing fresh water for at least 15 minutes. Do not attempt to re-warm. Cover both eyes with sterile dressing. Do not permit affected person to drink alcohol or smoke. Quickly transport affected person to an emergency medical facility.
Ingestion	Not a normal route of exposure as this product is a gas at room temperature and pressure.
Most important symptoms/effects, acute and delayed	Headache. Dizziness. Fatigue. Nausea, vomiting. Abdominal pain. Edema. Cyanosis (blue tissue condition, nails, lips, and/or skin). Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themself.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Keep away from sources of ignition. No smoking. Avoid contact with eyes and skin. Wear rubber gloves and safety glasses with side shields. Keep out of reach of children.

5. Fire Fighting Measures

Suitable extinguishing media	Stop the flow of gas. Carbon dioxide. Dry chemical. High expansion foam. Water fog.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. Container may explode in heat of fire. During fire, gases hazardous to health may be formed. Firefighters should wear a self-contained breathing apparatus. It is extremely dangerous to extinguish the fire without stopping the flow of gas. Gas and air will mix resulting in an explosion which may be more destructive than the original fire. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. May accumulate in confined spaces, resulting in an explosion and/or asphyxiation hazard.
Special protective equipment and precautions for firefighters	Firefighters should wear full protective clothing including self-contained breathing apparatus. Cool containers with flooding quantities of water until well after fire is out.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. In case of fire: Stop leak if safe to do so. Do not move cargo or vehicle if cargo has been exposed to heat. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Move containers from fire area if you can do so without risk. Do not direct water at source of leak or safety devices as icing may occur. Use water spray to cool unopened containers. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Extremely flammable gas. Contents under pressure. Pressurized container may explode when exposed to heat or flame.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	In the event of a leak evacuate all personnel until ventilation can restore oxygen concentrations to safe levels. Keep unnecessary personnel away. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Emergency personnel need self-contained breathing equipment. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Refer to attached safety data sheets and/or instructions for use. Evacuate area and keep it isolated until all gas is dispersed. Remove all sources of ignition. Ventilate area. Stop leak if it can be done safely. Water spray may be used to dissipate. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. For waste disposal, see section 13 of the SDS.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Prevent entry into waterways, sewers, basements or confined areas. Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Do not smoke. All equipment used when handling the product must be grounded.
Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Purge air from system before introducing gas. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Use only outdoors or in a well-ventilated area. Avoid prolonged exposure.
Wear appropriate personal protective equipment. Do not enter storage areas or confined spaces unless adequately ventilated. Wash thoroughly after handling. Oxygen concentration should not fall below 19.5 % at sea level (pO2 = 135 mmHg). Observe good industrial hygiene practices. Mechanical ventilation or local exhaust ventilation may be required. Wash hands before breaks and immediately after handling the product.
Non-sparking equipment. Explosion-proof ventilation. Intrinsically safe electrical equipment. Use good industrial hygiene practices in handling this material. When using do not eat or drink.

Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Stored containers should be periodically checked for general condition and leakage. Containers should be vented and equipped with a flame arrester. Store in a cool well-ventilated area. Consider leak detection and alarm equipment for storage area. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Ethyl mercaptan (CAS 75-08-1)	Ceiling	25 mg/m3 10 ppm
Propane (CAS 74-98-6)	PEL	1800 mg/m3 1000 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Butane (CAS 106-97-8)	STEL	1000 ppm
Ethyl mercaptan (CAS 75-08-1)	TWA	0.5 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Butane (CAS 106-97-8)	TWA	1900 mg/m3 800 ppm
Ethyl mercaptan (CAS 75-08-1)	Ceiling	1.3 mg/m3 0.5 ppm
Propane (CAS 74-98-6)	TWA	1800 mg/m3 1000 ppm

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Oxygen concentrations in work spaces must not be permitted to fall below 19%. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear goggles or face shield.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. Insulated gloves for contact with liquid. Confirm with a reputable supplier first.
Other	Wear suitable protective clothing. Use of fire resistant protective coveralls and long sleeves is recommended. As required by employer code.
Respiratory protection	For confined spaces, wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Where exposure guideline levels may be exceeded, use an approved NIOSH respirator. Respirator should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134), CAN/CSA-Z94.4 and ANSI's standard for respiratory protection (Z88.2).
Thermal hazards	Wear appropriate thermal protective clothing, when necessary. Wear cold insulating gloves and either face shield or eye protection.
General hygiene considerations	When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. When using do not eat or drink.

9. Physical and Chemical Properties

Appearance	gaseous
Physical state	Gas.
Form	Liquefied gas.
Color	Colorless
Odor	Mercaptan-like
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	-49 °F (-45 °C)
Pour point	Not available.
Specific gravity	-0.531 @ 32°F
Partition coefficient (n-octanol/water)	Not available
Flash point	-157.0 °F (-105.0 °C) Pensky-Martens Closed Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Flammable gas.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	> 2.1
Explosive limit - upper (%)	> 9.5
Vapor pressure	-208 PSI @ 200°F
Vapor density	1.5 (Air = 1)
Relative density	Not available.
Solubility(ies)	< 0.1%
Auto-ignition temperature	809 °F (431.67 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	1.54 g/cm³
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

10. Stability and Reactivity

Reactivity	This product may react with strong oxidizing agents.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Heat, open flames, static discharge, sparks and other ignition sources. Vapours may form explosive mixture with air.
Incompatible materials	Oxidizers. Halogenated compounds.
Hazardous decomposition products	May include and are not limited to: Oxides of carbon.

11. Toxicological Information

Information on likely routes of exposure

Inhalation	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Prolonged inhalation may be harmful. This product is an asphyxiant gas which can cause unconsciousness/death if OXYGEN levels are sufficiently reduced. Signs and symptoms of preceding asphyxiation include and are not limited to rapid respiration, loss of mental alertness and co-ordination, dizziness, nausea and vomiting. Continued exposure may result in prostration, convulsions, coma and death.
Skin contact	Contact with liquid may cause frostbite.
Eye contact	Contact with liquid may cause frostbite.
Ingestion	Not a normal route of exposure. The product is a gas at room temperature.
Symptoms related to the physical, chemical and toxicological characteristics	Headache. Dizziness. Fatigue. Nausea, vomiting. Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themself. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

Information on toxicological effects

Acute toxicity

Components	Species	Test Results
Butane (CAS 106-97-8)		
Acute		
Dermal		
LD50	Not available	
Inhalation		
LC50	Mouse	539600 ppm, 120 Minutes, ECHA
		520400 ppm, 120 Minutes, ECHA
		1237 mg/L, 120 Minutes
		680 mg/L, 2 Hours, HSDB
		57 %, 120 Minutes, ECHA
		52 %, 120 Minutes
	Rat	> 800000 ppm, 10 Minutes, ECHA
		1442738 mg/m3, 10 Minutes, ECHA
		1354944 mg/m3, 10 Minutes, ECHA
		570000 ppm, 10 Minutes, ECHA
		276000 ppm, 4 Hours, CCOHS
		1443 mg/L, 10 Minutes, ECHA
		1355 mg/L, 10 Minutes
Oral		
LD50	Not available	
Ethyl mercaptan (CAS 75-08-1)		
Acute		
Dermal		
LD50	Rat	> 2000 mg/kg, HSDB

Components	Species	Test Results
		> 2000 mg/kg, 24 Hours, ECHA
Inhalation		
LC50	Mouse	4420 ppm, 4 Hours, HSDB
		7 mg/L, 4 Hours, ECHA
	Rat	> 2.5 mg/L, 4 Hours, ECHA
		> 1.9 mg/L, 4 Hours, ECHA
		2770 ppm, 4 Hours, HSDB
		11.2 mg/L, 4 Hours, ECHA
Oral		
LD50	Rat	682 mg/kg, ECHA
Propane (CAS 74-98-6)		
Acute		
Dermal		
LD50	Not available	
Inhalation		
LC50	Mouse	539600 ppm, 120 Minutes, ECHA
		520400 ppm, 120 Minutes, ECHA
		1237 mg/L, 120 Minutes, ECHA
		57 %, 120 Minutes, ECHA
		52 %, 120 Minutes, ECHA
	Rat	> 800000 ppm, 10 Minutes, ECHA
		1442738 mg/m3, 10 Minutes, ECHA
		1354944 mg/m3, 10 Minutes, ECHA
		570000 ppm, 10 Minutes, ECHA
		1443 mg/L, 10 Minutes, ECHA
		1355 mg/L, 10 Minutes
Oral		
LD50	Not available	

Skin corrosion/irritation	Contact with liquid may cause frostbite.
Exposure minutes	Not available.
Erythema value	Not available.
Oedema value	Not available.
Serious eye damage/eye irritation	Contact with liquid may cause frostbite.
Corneal opacity value	Not available.
Iris lesion value	Not available.
Conjunctival reddening value	Not available.
Conjunctival oedema value	Not available.
Recover days	Not available.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classified or listed by IARC, NTP, OSHA and ACGIH.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity	Non-hazardous by OSHA criteria.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not likely, due to the form of the product.
Chronic effects	Prolonged inhalation may be harmful.
Further information	Not available.

12. Ecological Information

Ecotoxicity See below

Ecotoxicological data

Components		Species	Test Results
Ethyl mercaptan (CAS 75-08-1)			
Crustacea	EC50	Daphnia	185 mg/L, 48 Hours

Persistence and degradability This product has not been tested.

Bioaccumulative potential Not available.

Partition coefficient n-octanol / water (log Kow)

Butane	2.89
Propane	2.36

Mobility in soil This product has not been tested.

Mobility in general Not available.

Other adverse effects This product has not been tested.

13. Disposal Considerations

Disposal instructions	Pressurized container: Do not pierce or burn, even after use. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

General Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: Ensure that containers are firmly secured. Ensure cylinder valve is closed and not leaking. Ensure valve outlet cap nut or plug (where provided) is correctly fitted. Ensure valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

U.S. Department of Transportation (DOT)

Basic shipping requirements:

UN number	UN1075
Proper shipping name	Petroleum gases, liquefied
Hazard class	2.1
Special provisions	T50, N95
Packaging exceptions	306
Packaging non bulk	304
Packaging bulk	314, 315

DOT

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Butane (CAS 106-97-8)	Listed.
Ethyl mercaptan (CAS 75-08-1)	Listed.
Propane (CAS 74-98-6)	Listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - Yes
Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) Not regulated.

Food and Drug Administration (FDA) Not regulated.

US state regulations See below

US - Illinois Chemical Safety Act: Listed substance

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US - Louisiana Spill Reporting: Listed substance

Butane (CAS 106-97-8)	Listed.
Ethyl mercaptan (CAS 75-08-1)	Listed.
Propane (CAS 74-98-6)	Listed.

US - Minnesota Haz Subs: Listed substance

Butane (CAS 106-97-8)	BUTANE
Ethyl mercaptan (CAS 75-08-1)	ETHYL MERCAPTAN
Propane (CAS 74-98-6)	PROPANE

US - New Jersey RTK - Substances: Listed substance

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US - North Carolina Toxic Air Pollutants: Listed substance

Ethyl mercaptan (CAS 75-08-1)

US - Texas Effects Screening Levels Hazard Data: Simple asphyxiant

Propane (CAS 74-98-6)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US. New Jersey Worker and Community Right-to-Know Act

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US. Pennsylvania RTK - Hazardous Substances

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US. Pennsylvania Worker and Community Right-to-Know Law

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US. Rhode Island RTK

Butane (CAS 106-97-8)
Ethyl mercaptan (CAS 75-08-1)
Propane (CAS 74-98-6)

US. California Proposition 65

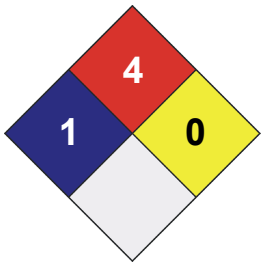
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

16. Other Information

LEGEND	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0



Disclaimer The information in the sheet was written based on the best knowledge and experience currently available. Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date 15-February-2019

Version # 01

Further information For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

Prepared by Dell Tech Laboratories, Ltd. Phone: (519) 858-5021