Product Stewardship Summary
Light Natural Gas Liquids (NGL) Products

The product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of all health and safety information. Additional information on these chemicals is available through the applicable Material Safety Data Sheets (MSDS, also known as SDS) which must be consulted before using these chemicals. The product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

Chemical identity:
Light natural gas liquids (NGL) are a category of products. Light NGLs comprise the group of saturated hydrocarbons just heavier than methane. They include ethane, propane, and butanes (iso and normal), all of which can be extracted in natural gas processing plants. Propane and butanes can also be extracted in crude oil refineries.

This category contains four members, with CAS numbers and names listed below.

CAS Number	Product Name
74-84-0	Ethane
74-98-6	Propane
106-97-8	Normal butane (n-butane)
75-28-5	Isobutane

Category Justification:
Light NGL products are saturated short chain (carbon number ranges from 2 to 4) simple hydrocarbons. Their physical/chemical properties and toxicity profiles are similar.

Product Uses:
Ethane is used as a petrochemical feedstock to produce ethylene and other petrochemical building blocks. Propane is a heating and transportation fuel also used as a petrochemical feedstock making ethylene and propylene. Normal butane is a refinery blend stock for motor gasoline and is also used as a petrochemical feedstock. Iso-butane is a refinery feedstock for alkylation, MTBE (Methyl Tertiary Butyl Ether) & TAME (Tertiary Amyl Methyl Ether) manufacturing and can be used for motor gasoline blending.

Physical/chemical properties:
Light NGL products are colorless, odorless (except isobutane which has a very faint odor) and flammable gases at ambient temperature and pressure. Light NGL products can be liquefied under pressure for the ease of storage and transportation.

Health Information:
The most likely exposure route is inhalation due to the gas state of Light NGL products. Light NGL products are of low toxicity. Excessively high levels of Light NGL product

vapors can cause asphyxia/suffocation by displacement of the available oxygen in breathing air. Inhaling high concentrations of propane, n-butane, or isobutane can cause drowsiness, dizziness, headache, anesthesia and/or other effects on the central nervous system. Contact with liquefied gas can cause frostbite and cold burn to skin and/or the eyes due to the rapid evaporation.

Environmental Information:
If released to the environment, Light NGL products will quickly move into the air and break down by photodegradation. They are not expected to bioaccumulate. Light NGL products are not considered PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent very Bioaccumulative) chemicals.

Exposure Potential:

- *Workplace use:* This refers to potential exposure of Light NGL products to persons in a manufacturing facility or through various industrial applications. Manufacturing and transport involving Light NGL products are conducted in closed systems, so human exposure is expected to be very limited. Limited exposure may occur during maintenance, sampling, testing or other procedures.

- *Consumer use:* Light NGL products may occasionally be sold by others into consumer applications as fuels, such as propane for heating and cooking, or butane for portable lighters.

- *Potential environmental release:* There may be some potential for exposure to the environment from an accidental release of Light NGL products due to transportation of large quantities over long distances; however, exposure due to a release is believed to be very low. Chevron Phillips Chemical Company LP is committed to operating in an environmentally responsible manner and has adopted the American Chemistry Council's Responsible Care® initiative.

Risk Management:
Chevron Phillips Chemical is committed to product stewardship and doing business responsibly. We endeavor to provide sufficient information for the safe use and handling of all our products. We begin by ensuring that all of our customers, distributors, carriers and users of Light NGL products are well informed about the properties of each product. To that end, a MSDS accompanies each shipment from our manufacturing plant.

Regulatory Information:
Regulations exist that govern the manufacture, sale, transportation, use and/or disposal of products of the light NGL products category. These regulations may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant product MSDS.

Sources of Additional Information:

- Organization for Economic Cooperation and Development (OECD) - eChemPortal web-based search tool (use applicable CAS No): http://www.echemportal.org/echemportal/
- U.S. Environmental Protection Agency (US EPA) - High Production Volume Information System (HPVIS): http://www.epa.gov/hpvis/index.html
- European Chemicals Agency (ECHA) – Information on Registered Substances: http://apps.echa.europa.eu/registered/registered-sub.aspx\
- Chevron Phillips Chemical's Material Safety Data Sheets: http://www.cpchem.com/en-us/pages/msdssearch.aspx

Conclusion:

Light NGL products are extremely flammable and are of low toxicity. Inhaling very high concentrations of Light NGL products can cause central nervous system effects and suffocation. Appropriate personal protective equipment practices and labeling, storage, and transportation procedures must be followed. Further, the relevant product MSDS and applicable regulatory guidelines and requirements, including Occupational Health and Safety Administration (OSHA) guidelines, should be consulted prior to the use or handling of Light NGL products.

Contact Information:

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Date: August 14, 2013