1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

PRODUCT: Plas2Fuel Synthetic Crude Oil
MANUFACTURER: Plas2Fuel Corporation
2300 Talley Way, Suite B
Kelso, WA  98632
United States of America
Emergency Telephone No. (360) 431-0438
SYNONYMS: Synthetic Petroleum Oil
Plas2Fuel Oil
See Section 16 for Abbreviations and Acronyms
PRODUCT USE: Refinery feedstock for petroleum and petrochemical refining.
PREPARED BY: Kevin DeWhitt
(360) 577-5654 (Business Hours)
DATE OF PREPARATION/REVISION: March 19, 2009

2. COMPOSITION, INFORMATION ON INGREDIENTS

A low-sulfur pyrolyzate consisting of light and heavy gas oil petroleum fractions derived from the depolymerization of mixed waste plastic (MWP). It consists predominantly of paraffins, cyclic paraffins, olefins and cyclic aromatic hydrocarbons having carbon numbers predominantly in the range of C₅ to C₅₀, boiling between 36 and 550 °C. It may also contain small amounts of benzene and oxygenated compounds, and trace amounts of nitrogen and sulfur compounds.

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>EXPOSURE LIMITS</th>
<th>CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic Petroleum Oil (CAS Number 68553-00-4)</td>
<td>OSHA PEL-TWA: 5 mg/m³ as mineral oil mist</td>
<td>100</td>
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<tr>
<td></td>
<td>ACGIH TLV-TWA: 5 mg/m³ as mineral oil mist*</td>
<td></td>
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<tr>
<td>Benzene (CAS Number 71-43-2)</td>
<td>OSHA PEL-TWA/STEL: 1 / 5 ppm</td>
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<tr>
<td></td>
<td>ACGIH TLV-TWA: 0.5 / 2.5 ppm, A1, skin</td>
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<td></td>
<td>US Coast Guard: same as OSHA</td>
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</tbody>
</table>
3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION!
FLAMMABLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM
HARMFUL OR FATAL IF SWALLOWED

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia. Aspirated crude oil is a threat to life.

ROUTE OF ENTRY:
Skin contact, skin absorption, eye contact, inhalation, and ingestion.

EYES:
Contact with eyes may cause moderate to severe irritation.

SKIN:
May cause irritation. May cause moderate inflammatory redness, fluid build-up, and slight burning on exposed skin. May damage the liver and kidneys. May cause irritation characterized by inflammation, dryness, pigmentation, and/or lesions of the hair follicles. May aggravate existing skin conditions. May affect the blood, liver, and kidneys. May cause changes to the skin. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact.

INGESTION:
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION:
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

CHRONIC and CARCINOGENICITY:
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. This product contains polynuclear aromatic hydrocarbons which have
been shown to be carcinogenic in laboratory animals after repeated and prolonged skin contact. The significance of these results to human exposures has not been determined - see Section 11, Toxicological Information. Contains benzene, which is a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:**
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Pre-existing, chronic respiratory disease, liver or kidney dysfunction, or central nervous system disorders may be aggravated by exposure.

## 4. FIRST AID MEASURES

**EYES:**
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

**SKIN:**
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

**INGESTION:**
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

**INHALATION:**
Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

**GENERAL:**
In all cases seek medical attention.

## 5. FIRE FIGHTING MEASURES

**FLAMMABLE PROPERTIES:**
FLASH POINT: < 73 °F (< 23 °C)
AUTOIGNITION TEMPERATURE: Approximately 500 °F (246 °C)
OSHA/NFPA FLAMMABILITY CLASS: 1B (flammable liquid)
LOWER EXPLOSIVE LIMIT (%): N/D
UPPER EXPLOSIVE LIMIT (%): N/D

**FIRE AND EXPLOSION HAZARDS:**
Flash point and explosive limits are highly dependent on the crude oil source. Treat as an OSHA/NFPA Class 1B flammable liquid when ambient air temperatures exceed 90° F, and as a readily combustible solid when ambient air temperatures are below this threshold. Vapors may
be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open and potentially explode in confined spaces. A portion of the vapors may travel long distances to an ignition source and flash back.

**EXTINGUISHING MEDIA:**
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon. LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

**FIRE FIGHTING INSTRUCTIONS:**
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other firefighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA-approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam. See Section 16 for the NFPA 704 Hazard Rating.

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6. ACCIDENTAL RELEASE MEASURES

**LEAK AND SPILL PROCEDURE:**
Shut off all sources of ignition and evacuate area. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Carefully contain and stop the source of the spill, if safe to do so. Since the material is a solid at temperatures of less than approximately 100°F, spillage of the material in a liquid phase will be followed by a congealing of the material as it cools. No severe penetration of spilled material will occur, either into the ground or into a body of water. The material will float on a body of water and can be skimmed off of the surface to be reclaimed. For ground exposure, the material may be reclaimed by scooping or shoveling, and 1-2 inches of groundcover should be excavated as treated as material contaminated with hydrocarbons. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment.

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7. HANDLING AND STORAGE

**HANDLING PRECAUTIONS:**
Handle the material as a flammable liquid at warm temperatures (≥100°F) and as a readily combustible solid as temperatures below this threshold. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for use with the proper classification. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire.
STORAGE PRECAUTIONS:
Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES:
Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS:
Ventilate confined space before entry. Provide local exhaust where appropriate to minimize fugitive vapors or mists. Provide adequate general ventilation to dilute vapor concentrations within buildings.

EXPOSURE LIMITS:
8-hour OEL = 300 ppm (total hydrocarbon)
8-hour OEL = 5 mg/m3 (aerosol)
Benzene 8-hour OEL = 1 ppm
Benzene 15-minute OEL = 5 ppm

PERSONAL PROTECTIVE EQUIPMENT:
Eye/ Face Protection: Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.
Skin Protection: Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont Tyvek QC®, Saranex®, TyChem® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.
Respiratory Protection: A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.
Footwear: Not required under normal conditions. Remove and change footwear if contaminated.
Clothing: Coveralls/apron as required.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE:**
Variable depending on its source; typical is a thick, dark yellow to brown solid, with a waxy consistency.

**ODOR:**
A characteristic, petroleum/asphalt-type odor.

**PHYSICAL STATE:**
Solid below about 100° F, liquid phase above this threshold

**pH:**
Not applicable

**BASIC PHYSICAL PROPERTIES:**
The properties of crude oil are highly variable depending on its source.

- **VAPOR PRESSURE:** Variable
- **BOILING RANGE:** AP 100 - 750+ °F
- **VAPOR DENSITY:** (air = 1): 3 - 5 typical
- **SPECIFIC GRAVITY:** (H2O = 1): AP 0.7 to 0.9 (varies)
- **PERCENT VOLATILES:** Variable
- **EVAPORATION RATE:** Variable
- **SOLUBILITY (H2O):** Insoluble to slightly soluble

### 10. STABILITY AND REACTIVITY

**STABILITY:** Stable, hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS:** Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.

**HAZARDOUS DECOMPOSITION PRODUCTS:**
Carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and soot.

### 11. TOXICOLOGICAL INFORMATION

**CHRONIC EFFECTS AND CARCINOGENICITY:**

**CARCINOGENICITY:**
- OSHA: NO
- IARC: NO
- NTP: NO
- ACGIH: 1997 NOIC: A1

**DERMAL CARCINOGENICITY:** Positive – mice.
Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that
washing the animal's skin with soap and water between applications reduced tumor formation.

This product contains benzene. Human health studies indicate that prolonged and/or repeated
overexposure to benzene may cause damage to the blood-forming system (particularly bone
marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed
as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

**MUTAGENICITY (genetic effects):**
Some crude oils and crude oil fractions have been positive in mutagenicity studies.

**SYNERGISTIC EFFECTS:**
May act as a synergist to pesticides. The combination of crude oil and ultraviolet radiation may
potentiate the suppressive effect on Langerhans cell density and contact hypersensitivity.
Ultraviolet light may increase the severity of the effects to the skin.

### 12. ECOLOGICAL INFORMATION

**ECOLOGICAL INFORMATION:** Keep out of sewers, drainage and waterways. Report spills
and releases as applicable under Federal and State regulations.

### 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL:** Recover for reuse and recycling on plant site if possible. Small quantities
off-site can be burned in a chemical incinerator equipped with afterburner and scrubber. Comply
with relevant legislation. Consult federal, state and local waste regulations to determine
appropriate disposal options.

### 14. TRANSPORT INFORMATION:

**TRANSPORTATION INFORMATION:**
**PROPER SHIPPING NAME:** SYNTHETIC PETROLEUM CRUDE OIL

**HAZARD CLASS / PACKING GROUP:** Class 3, Group 2

**DOT IDENTIFICATION NUMBER:** UN 1267

**DOT SHIPPING LABEL:** FLAMMABLE LIQUID

### 15. REGULATORY INFORMATION

**U.S. FEDERAL, STATE and LOCAL REGULATORY INFORMATION:**
This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or
uncontrolled release of this product, including any substantial threat of release, may be subject
to federal, state and/or local reporting requirements. This product and/or its constituents may
also be subject to other regulations at the state and/or local level. Consult those regulations
applicable to your facility/operation.
CLEAN WATER ACT (OIL SPILLS):
Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT):
The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

<table>
<thead>
<tr>
<th></th>
<th>ACUTE HEALTH</th>
<th>CHRONIC HEALTH</th>
<th>FIRE</th>
<th>SUDDEN RELEASE OF PRESSURE</th>
<th>REACTIVE</th>
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<tr>
<td></td>
<td>X</td>
<td>X</td>
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SARA SECTION 313 - SUPPLIER NOTIFICATION
This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

**INGREDIENT NAME (CAS NUMBER)** | **CONCENTRATION WT. PERCENT**
--- | ---
Benzene (71-43-2) | Variable (Typically <5%)

CANADIAN REGULATORY INFORMATION (WHMIS)
Class B, Division 2 (flammable liquid)
Class D, Division 1B (Very toxic by other means)

16. OTHER INFORMATION

**NFPA® HAZARD RATING**

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
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<td>Slight</td>
<td>High</td>
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**HMIS® HAZARD RATING**

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<tr>
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**ABBREVIATIONS:**

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million
ACRONYMS:

ACGIH  American Conference of Governmental Industrial Hygienists
AIHA  American Industrial Hygiene Association
ANSI  American National Standards Institute (212)642-4900
API  American Petroleum Institute (202)682-8000
CERCLA  Comprehensive Emergency Response, Compensation, and Liability Act
DOT  U.S. Department of Transportation [General info: (800)467-4922]
EPA  U.S. Environmental Protection Agency
HMIS  Hazardous Materials Information System
IARC  International Agency For Research On Cancer
MSHA  Mine Safety and Health Administration
NFPA  National Fire Protection Association (617)770-3000
NIOSH  National Institute of Occupational Safety and Health
NOIC  Notice of Intended Change (proposed change to ACGIH TLV)
NTP  National Toxicology Program
OPA  Oil Pollution Act of 1990
OSHA  U.S. Occupational Safety & Health Administration
PEL  Permissible Exposure Limit (OSHA)
RCRA  Resource Conservation and Recovery Act
REL  Recommended Exposure Limit (NIOSH)
SARA  Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA  Self-Contained Breathing Apparatus
SPCC  Spill Prevention, Control, and Countermeasures
STEL  Short-Term Exposure Limit (generally 15 minutes)
TLV  Threshold Limit Value (ACGIH)
TSCA  Toxic Substances Control Act
TWA  Time Weighted Average (8 hr.)
WEEL  Workplace Environmental Exposure Level (AIHA)
WHMIS  Canadian Workplace Hazardous Materials Information System

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