

**APPLICATION FOR AN INCINERATOR BAN APPLICABILITY STATUS
DECISION**

**State of Delaware
Department of Natural Resources & Environmental Control
Office of the Secretary**

**DECEMBER 19, 2012
PLASTIC-TO-OIL RECYCLING
MIKE DAVIDSON ENTERPRISES, LLC**

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Incinerator Ban Applicability Status Decision Application Instructions

1. Complete all parts of the application. For questions which are not applicable to your project, do not leave blank; present a statement that clearly states why the section is not applicable to your project.
2. Because all applicants' projects are different, this word document template will provide you flexibility for needed space to answer the questions. Please insert additional lines for text where needed for your application. If appropriate, attach extra pages referencing each answer by the corresponding question number.
3. Submit a complete digital copy of the application to:

State of Delaware
Department of Natural Resources & Environmental Control
Office of the Secretary
89 Kings Highway
Dover, DE 19901
Or
DNREC_SBO@state.de.us

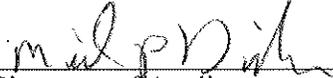
4. Comply, if required, or as requested by the DNREC Secretary, with 7 Delaware Code, Chapter 79, Section 7902. If requested, but not completed, your application will not be considered administratively complete until this form is received.
5. Be advised that the application for an Incinerator Ban Applicability Status Decision is a public document. If this application requires you to place confidential information or data in the application to make it administratively complete, note the Delaware Freedom of Information Act (29 Delaware Code, Chapter 100) and DNREC's Freedom of Information Act Regulation, Section 6 (Requests for Confidentiality), for the proper procedure in requesting confidentiality.

PART 1
CERTIFICATION BY APPLICANT

I hereby certify that all the information contained in this Delaware Incinerator Ban Applicability Status Decision Application and in any attachments is true and complete to the best of my belief.

I hereby acknowledge that all information in this application will be public information subject to the Delaware Freedom of Information Act, except for clearly identified proprietary information agreed to by the Secretary of the Department of Natural Resources & Environmental Control.

Michael P. Davidson
Print Name of Applicant


Signature of Applicant

President
Title

12/27/12
Date

PART 2

APPLICANT INFORMATION AND SITE IDENTIFICATION

2.1 Identification of the applicant:

Company Name: MIKE DAVIDSON ENTERPRISES, LLC
Parent Company: MIKE DAVIDSON ENTERPRISES, LLC
Address: 3051 WILLOW GROVE RD., CAMDEN WYOMING, DE
Telephone: (302) 284-2393
Fax: (302) 284-1034
Website:
EMAIL ADDRESS: ARLENESEAMAN928@YAHOO.COM

2.2 Primary contact: Please list the name, phone number and email of a preferred contact within your company in case DNREC needs to contact you regarding this status decision:
MICHAEL DAVIDSON OR ARLENE SEAMAN
(302) 284-2393, ARLENESEAMAN928@YAHOO.COM

2.3 Site of proposed project (if different than above), including a map of the site and surrounding area:

2.4 Authorized agent (if any):

Company
Address:
Telephone:
Fax:
E-mail:

If you have an authorized agent for this status decision process, provide written authorization from the client for being the authorized agent.

2.5 Is the applicant claiming confidentiality in any section of their application?

NO

If yes, see instructions on page 3, item 5.

PART 3

PROJECT SUMMARY

Provide a one-page summary describing the proposed project or use. Include a brief quantitative description of any anticipated environmental impacts.

The process of recycling plastic to oil involves heating shredded plastic until it melts and vaporizes, then condensing the vapor to obtain the desired product: oil.

The shredded plastic will be fed to a small horizontal drum. It will be transferred to the heating unit through a pipe using a plunger. In the heating unit, the plastic will melt and, under continued exposure to heat, will vaporize. The vapor will be transferred to a condensing system consisting of two condensers. The first condensate cut recovered will be approximately 65% of the feed. The second condensate cut recovered will be approximately 10% of the feed. The two condensates will be combined in a storage tank and, blended together, will make up the final product: Fuel Oil.

The vapor that does not condense in the condensing process will be discharged to the burner. Between the condensing process and the burner, it will pass through a fire-break to prevent burner flashback from entering the condensers. The fire-break will involve bubbling the vapor through water in a half-filled barrel. The vapor will be combusted in the burner to control the VOC emissions and to provide heat to the melting/vaporizing process. A flow diagram showing the following material balance is provided on the following page.

FEED	Fraction	Rate
Plastic Feed	100%	833 lbs/hour

PRODUCTS & BYPRODUCTS	Fraction	Rate
Fuel Oil 1 st Cut (product)	65%	542 lbs/hour
Fuel Oil 2 nd Cut (byproduct)	10%	83 lbs/hour
Carbon solids (byproduct)	5%	42 lbs/hour
Organic vapor (byproduct)	20%	166 lbs/hour

At steady-state operations, the burner will be burning 166 lbs/hour Vapor and 10 gallons/hour Fuel Oil. So, at steady-state, approximately, 71% of the heat input will be contributed by the Vapor. For the purposes of emissions calculations, the Vapor has been characterized as Propane gas (LPG) and the Fuel Oil has been characterized as No. 2 Fuel Oil. Carbon Solids will accumulate in the combustion unit and will be cleaned out manually on a daily basis.

At a feed rate of 833 lbs/hour, 625 lbs/hour of Fuel Oil is expected to be produced. At an average density of 7 lbs/gallon, 89 gallons of oil will be produced hourly. With a consumption rate of 10 gallons/hour for the burner, the net production rate of fuel oil for the proposed equipment is 79 gallons/hour, 1,264 gallons/day, and 328,640 gallons/year.

The estimated annual Criteria Air Pollutant emissions are:
PM10 – 76 PPY; PM2.5 – 92 PPY; SO₂ – 1,236 PPY; CO – 1,432 PPY; Lead – 0.061 PPY and
VOC – 3.46 TPY; NO_x – 1.48 TPY (Note: PPY = Pounds per year; TPY = Tons per year)

Of the 45 Hazardous Air Pollutants for which annual emissions were estimated, only one has an annual emission rate greater than 2 PPY: Formaldehyde – 29 PPY. Of these 45 HAPs, there are published occupational exposure limits for 22 of them. A screening analysis using SCREEN3 demonstrated that the predicted dispersion of each of the 22 HAPs with OELs would be well below 1% of the HAP's OEL.

PLASTICS TO OIL RECYCLING

BURNER RATING:

5 MMBTUs/hour heat input

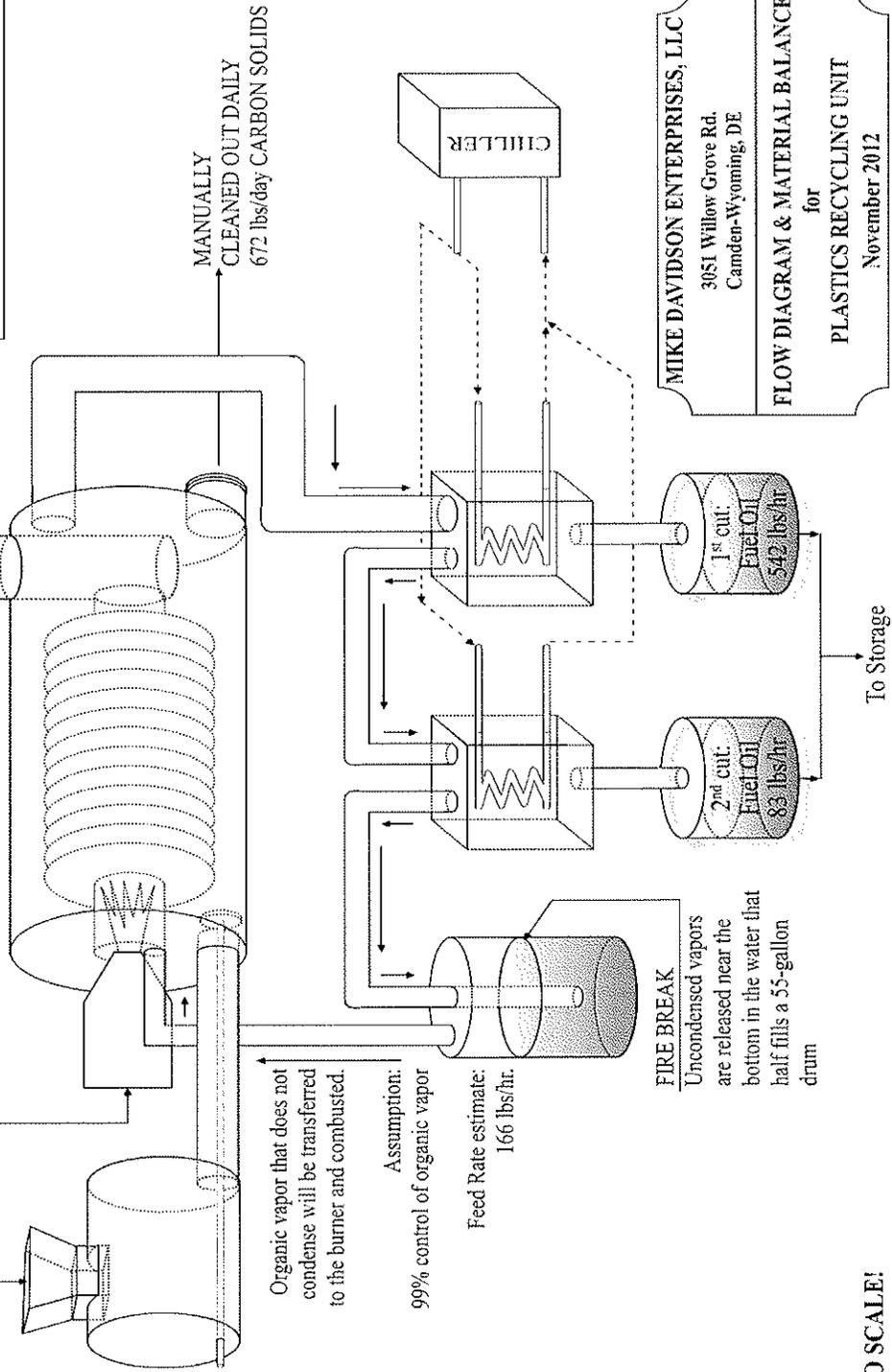
FUEL FEED:

110 gal/hr, Fuel Oil at steady state

36 gal/hr, Fuel Oil at start-up

Plastics -- 833 lbs/hr

Plastic Feed	100%	Hourly Feed
Output		833 lbs
1st Cut	65%	542 lbs
2nd Cut	10%	83 lbs
Carbon solids	5%	42 lbs
Organic vapor	20%	166 lbs



MIKE DAVIDSON ENTERPRISES, LLC
3051 Willow Grove Rd.
Camden-Wyoming, DE

FLOW DIAGRAM & MATERIAL BALANCE
for
PLASTICS RECYCLING UNIT
November 2012

NOT TO SCALE!

PART 4

PROJECT INFORMATION

- 4.1 Explain in detail the technology proposed for this project. Provide the manufacturer's information including a contact for the vendor and if the technology has been used or is in use anywhere else (if so, please provide the location and a contact person). Please provide as much detail as possible.

The technology proposed is recycling plastic by converting it to an oil that can be used for heat recovery. The technology involves applying indirect heat to shredded plastic until it melts and vaporizes. Two condensates are recovered and blended together to yield the desired product: fuel oil. The product is approximately 75% of the feed by weight. The balance of the feed are carbon solids and vapor. The carbon solids will not vaporize at the process temperatures and are expected to be approximately 5% of the feed by weight. The vapor is made up of organics that do not condense at the temperatures at which the condensers will operate and is expected to be approximately 20% of the feed by weight.

The plastics-to-oil unit will be fabricated on-site by the applicant.

The burner is rated at 5 MMBTUs per hour heat input. It fires into a finned fire-tube so that the flame is kept isolated from the plastic materials. At steady-state operations, the unit will burn 10.4 gallons per hour fuel oil (11.6% of the yield) and 166 pounds per hour vapor.

- 4.2 Provide an inclusive list of all materials and waste to be used as a feedstock in the process. Include information such as where the material and waste are generated, the process by which they are generated, how they will be transported to the site, and how they will be managed while stored at the site, etc.

Plastics labeled for recycling, 1 through 7:

- Polyethylene terephthalate
- High Density Polyethylene
- Polyvinyl Chloride
- Low Density Polyethylene
- Polypropylene
- Polystyrene
- Polycarbonate

The waste plastics which will be recycled will be obtained from generators such as Kraft Food. The materials will be under current the applicant's current resource recovery permit.

The waste plastics will be transported by vehicles over roadways.

The waste plastics will be sorted and stored in enclosed warehouses until they can be processed in the Plastic-to-Oil Recycling machine.

4.3 List any by-products, co-products, and wastes generated as a result of this proposed process and how those by-products, co-products, and wastes will be handled.

Carbon solids that do not melt at the process temperatures of the machine will be manually cleaned out of the machine daily. The solids will be sold to power companies which will use them for heat recovery.

Organic vapor that does not condense in the condensing system will be burned for heat recovery in the burner of the process heater.

4.4. Does the proposed project meet any of the following exemptions?

- 4.4 a Is it a Crematorium? **NO**
- 4.4 b Is there disposal of the bodies of animals? **NO**
- 4.4 c Is there burning of poultry waste or poultry manure at the same site where the waste or manure was generated, which shall include the burning of poultry waste or poultry manure generated upon an adjacent farm? **NO**
- 4.4 d Is there disposal of materials used in the discovery, development, and manufacture of veterinary products, medicines and vaccines? **NO**
- 4.4 e Is there the disposition of mortalities from poultry operations in facilities approved by the Delaware Department of Natural Resources and Environmental Control which comply with United States Department of Agricultural Natural Resources Conservation Service Interim Conservation Practice Standard Incinerator 769 or any successor standard? **NO**

4.5 Is there combustion or oxidation in any part of your process? If so, please provide a summary of the combustion/oxidation process.

Yes, combustion is used to generate the process heat which is applied INDIRECTLY to the plastic waste feed stream. There is no direct contact between the waste feed stream and the combustion flame, THEREFORE, NO OXIDATION OF THE WASTE PLASTIC FEED STREAM OCCURS.

4.6 At any point in your process, is oxygen (O₂) a necessary component? If so, please explain.

Yes, oxygen is required for combustion of fuel oil and organic vapor.

- 4.7 Is every point on the property boundary line of the property on which the proposed project is to be located at least 3 miles from every point on the property boundary line of any residence, church, school, park, or hospital?

NO.

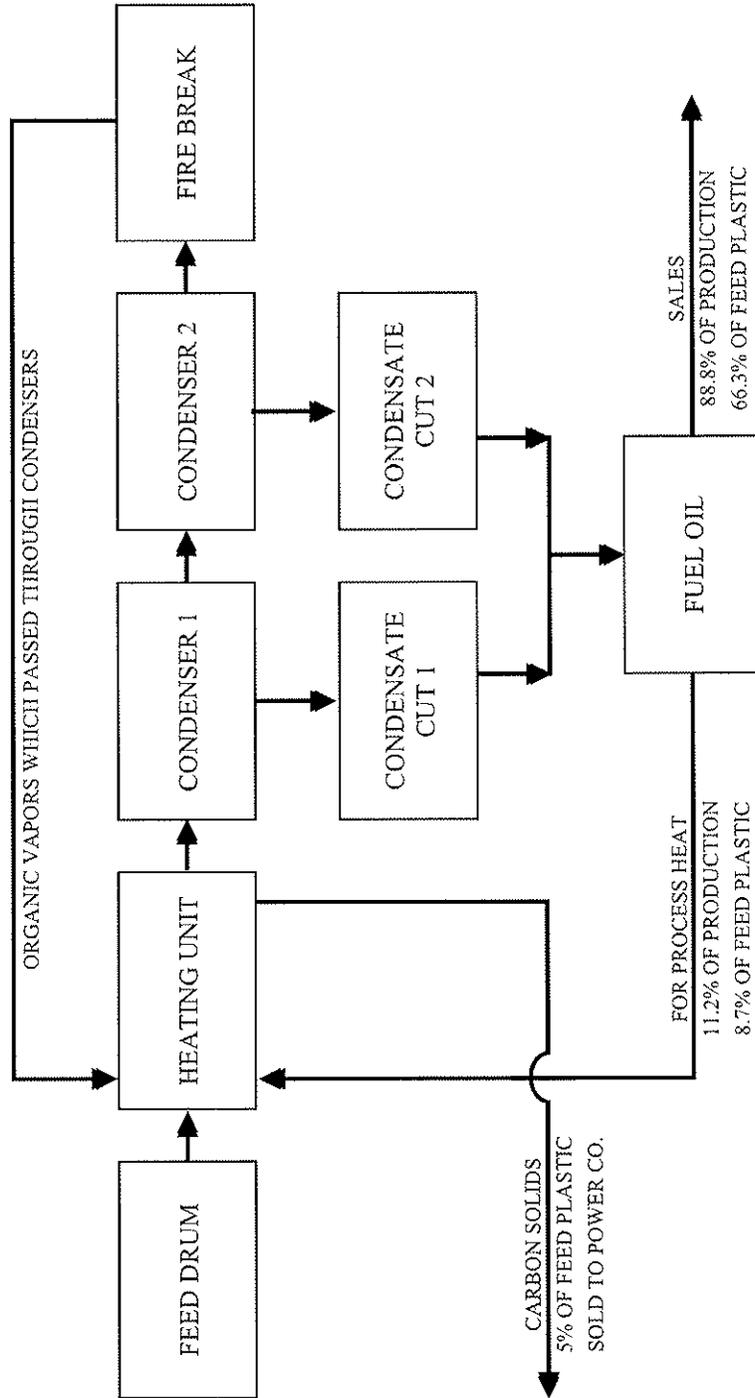
- 4.8 Explain why your process does not involve the combustion (oxidation) of solid waste and is exempt from the “incinerator ban.”

The process does not involve combustion (oxidation) of a solid waste because the flame does not come in contact with the waste plastic feed stream. After the waste plastic has been melted and vaporized, and oil has been recovered from the vapor, the remaining organic vapor which did not condense at the condenser operating temperatures is combusted for air pollution control and heat recovery purposes. After the condensate from the two condensers has been blended together to yield the final product, 11% of the product is used by the process to generate additional heat not provided by the vapor heat recovery.

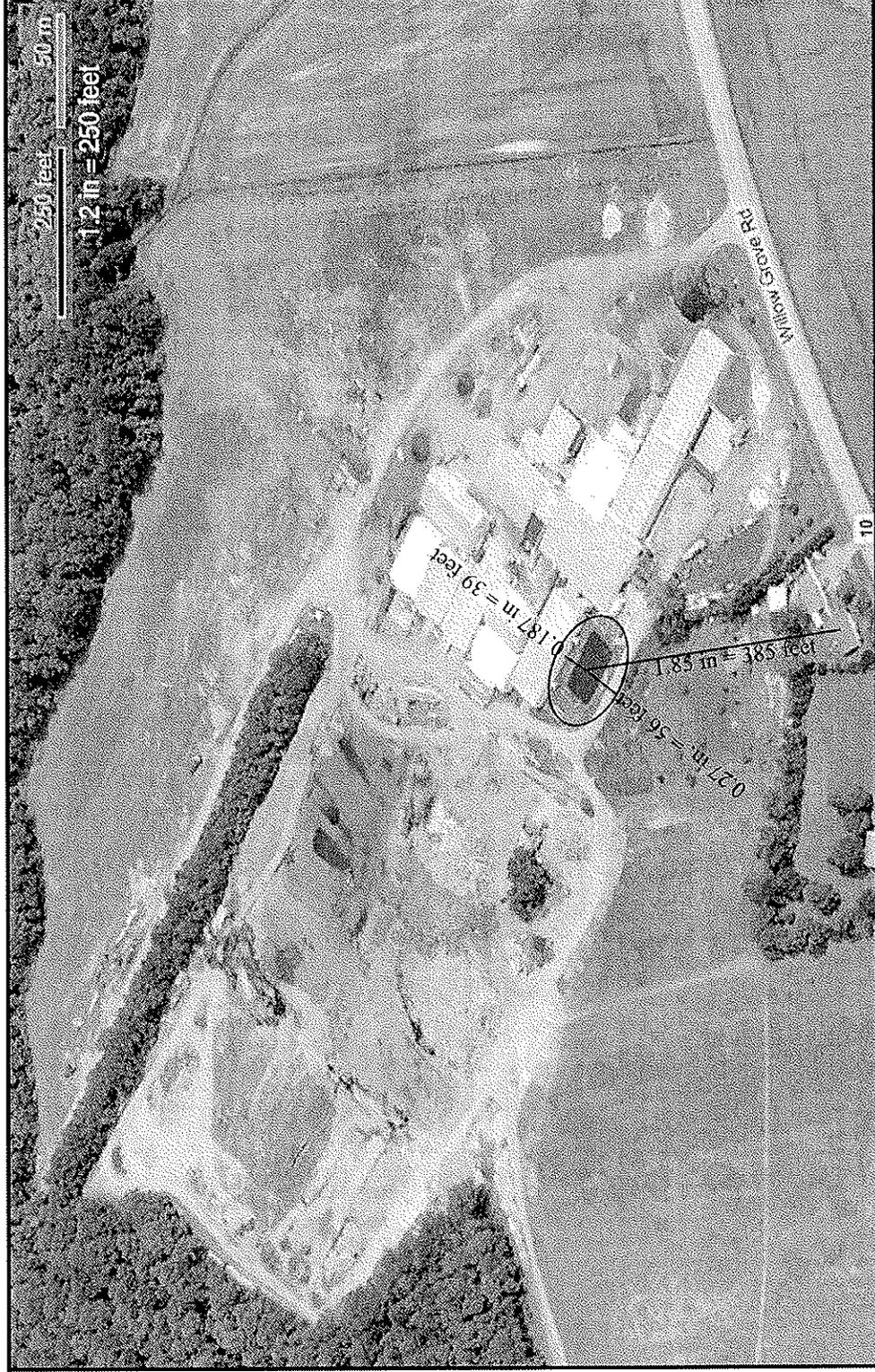
END OF APPLICATION

ATTACHMENTS TO FOLLOW

PROCESS BLOCK DIAGRAM



MIKE DAVIDSON ENTERPRISES, LLC.



3051 Willow Grove Rd., Camden Wyoming, DE 19934

The inch measurements added to the aerial view may not match up with a ruler when printed because the graphic was sized to fit the paper. They reflect the measurements made within the software.