

Reklaim Technologies, Inc.

Tire Processing and Reclamation Facility Boardman, Oregon

New Tire Processing and Reclamation Facility

Reklaim Technologies, Inc. (Reklaim), of Bellevue, WA, has completed construction of a tire processing and reclamation facility at the Port of Morrow near Boardman, Oregon. Final testing of equipment is underway. The owners are estimating that the start-up of the plant will take place by mid-November 2008. This will be the first phase of a planned three phase build-out for this facility. At build-out, the plant processing capacity is projected to be 5.4 million used passenger tires per year.

Reklaim received land use approval from Morrow County for the construction of this facility on August 21, 2007. DEQ then prepared and issued three operating permits for the facility --- an Air Contaminant Discharge Permit; a Waste Treatment Facility Permit; and, a Waste Tire Storage Permit.

The facility, when it becomes operational, will accept whole used passenger tires for processing. The tires will be chipped and then a low temperature pyrolysis technology will be used to convert the tires chips into three industrial products: fuel oil, carbon black, and metal.



*Reklaim Tire Processing & Reclamation Facility
Port of Morrow, Boardman, Oregon*

How the Process Works

Used passenger tires will be received at the site from tire dealers in enclosed semi-trailers. These tires will not be removed from the semi-trailers until they are ready to be processed, thus eliminating any environmental threats from tire piles stored outside.

The tires will be unloaded from the semi-trailers onto a conveyor belt. The conveyor will transport the whole tires to a chipper. From the

point where the whole tires enter the chipper, the process will be enclosed, and will operate automatically, with no further exposure of the materials to the environment.

The chipped tires will be pneumatically moved to a dryer, and then into a thermal processor. The chips will be heated in the processor to 850 degrees Fahrenheit in a reduced oxygen environment of 1-3%. The combination of the heated and oxygen-reduced environment will result in a breakdown of the rubber molecule bonds of the chips. This process will convert the tire chips into gases and solid residuals of carbon black, scrap metal, metal oxides, and Kevlar.

End Product Uses

The gases produced from this reclamation process will include vaporized oils and non-condensable gases. The vaporized oils will be condensed into a fuel oil. This oil will be stored onsite in two 25,000 gallon tanks prior to shipment to industrial fuel oil markets.

The non-condensable gases, which will consist primarily of hydrogen, methane, and light hydrocarbons, will initially be flared (burned without energy recovery). Eventually, Reklaim plans to capture these gases and use their fuel energy for powering on-site electrical generators. The planned generators will produce approximately 3 Megawatts of electricity and will include controls to reduce the amount of air pollutants emitted.

The carbon black will be pneumatically conveyed to a bagging facility within the Reklaim on-site warehouse. There it will be bagged and stored in polyester totes. The company will sell the totes of carbon black to off-site industrial markets where this material is used as an inorganic pigment in inks, paints and plastics; as an inorganic filler in paints, plastics and rubber/elastomers; as an internal anti-static agent in plastics; and, as a thickener in greases.

The scrap metal from this process will be separated, stored on-site in drums and then sold into the industrial scrap metal recycling market.

The metal oxides and Kevlar will initially be



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disposed of at a permitted solid waste disposal facility. At either the Phase II or Phase III build-out stage of the facility, Reclaim intends to capture and package the metal oxides and sell them into industrial markets.

Solid wastes that will be generated from this process (the metal oxides and Kevlar) are estimated by Reclaim to be between 1 – 2 % of the material in each passenger tire.

Pyrolysis is Not Incineration

Incineration (straight burning) of tires requires an oxygen-rich environment and high temperatures of approximately 3,000 degrees Fahrenheit. Incineration destroys all potentially usable materials in used tires.

Pyrolysis is not incineration, but rather a heating of tire chips in an oxygen-reduced environment. This process turns the rubber component of the tires into vaporized oils and non-condensable gases, with leftover residuals of Kevlar, metal, and carbon black. Further processing of these materials allows for their capture as fuel oil, carbon black, scrap metal, with a nominal amount of solid wastes produced and some air emissions generated (see Table 1). These captured materials are then available for sale as products into industrial markets.

Environmental Controls

Stored Tires: Reclaim will store the whole used passenger tires they receive on-site in enclosed semi-trailers. This method of storage will eliminate potential disease impacts related to mosquito breeding in pooled rainwater in tires and air contamination and potential respiratory impacts from tire pile fires.

Processing of Tires: Reclaim will utilize a totally enclosed reclamation process with high efficiency filters for the chipping, drying, processing, packaging and storage of the tire products.

This enclosed method will reduce the potential for spills of liquid oil, which have the potential to enter and impact groundwater and surface water. This enclosed method will also reduce the potential for the release of powdered carbon black. This powder, if released, can degrade air quality, and can also result in respiratory impacts for humans and animals.

Air emissions: The operation of the facility will generate air pollutants. These pollutants are compounds that, if inhaled, may lead to health

effects that generally aggravate cardiovascular and respiratory disease. The level of impacts should be minimal due to the process design and the use of emission control technologies.

The following table identifies the allowable (permitted), and maximum, expected air emission limits for the Reclaim facility:

Table 1 - Air Emissions

Criteria Pollutant	Permitted Emission Limit (tons/yr)	Maximum Expected Emissions (tons/yr)
Particulate Matter (PM)	24	12
Fine Particulate Matter (PM ₁₀)	14	12
Sulfur Dioxide (SO ₂)	39	5
Nitrogen Oxides (NO _x)	39	18
Carbon Monoxide (CO)	99	32
Volatile Organic Compounds (VOCs)	39	8

Outcome

At proposed build-out, this one facility would consume approximately 2% (5.4 million) of the 300 million waste tires generated each year in the U.S. (Source: Rubber Manufacturers Assoc.)

This 2% of reclaimed waste tires would make available for industrial use --- 7.4 million gallons of fuel oil, 22,680 tons of carbon black, and 5,400 tons of scrap metal --- according to Reclaim estimates. These products would replace virgin materials currently purchased for these markets.

Alternative Formats

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