

Project Summary- Oilfield Waste Treatment Plant

Oilfield Waste Management Services (OWMS) plans to construct a thermal desorption waste treatment plant in Guyana to support the growing oil exploration activities. The plant is based on a thermal desorption separator (hammer mill) which uses friction to heat wastes so that oil residue are evaporated. The evaporated oil and water contents are then condensed and recaptured / separated. The remaining solids can then be safely disposed or reused.

OWMS plans to recycle the recaptured oil so that it can be used in the Liquid Mud Plant manufacturing process. The solid wastes will be used in the bitumen manufacturing process. No solids are expected to be sent to landfills.

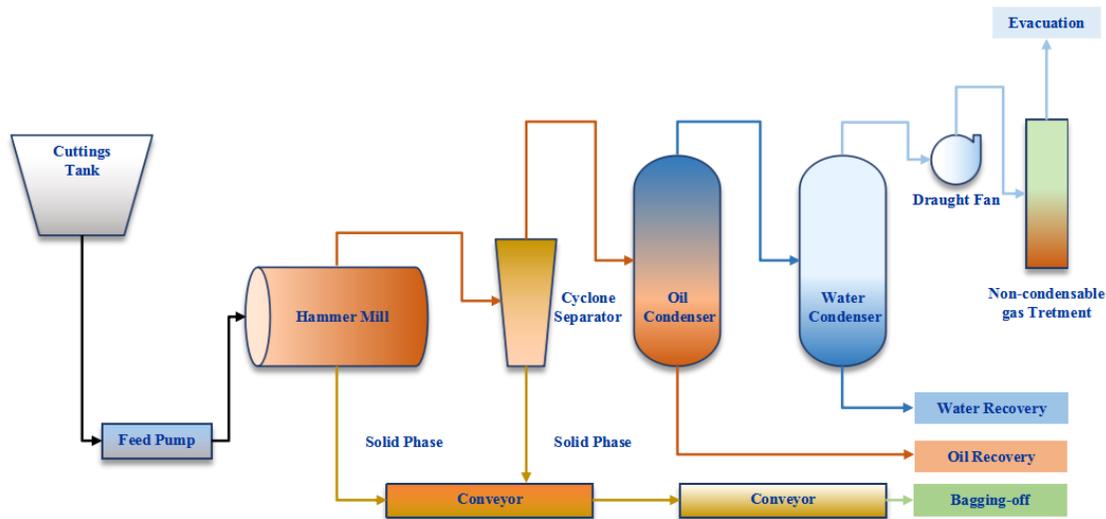


Figure 1: Process Flow Diagram of the Planned Waste Treatment Plant

Layout overview

The footprint of treatment plant is about 5000 m², the length is about 100 m, and the width is about 50 m. The general plan of the project is divided into four functional areas: Operation area, oily cuttings storage area, treated cuttings storage area and office and living area.

■ Requirements of operation

✓ Operation area

The concrete ground with rainproof shelter, cover an area of about 800m². The GWTDU, water tanks and oil tanks will be located here.

✓ **Oily cuttings storage area**

The concrete pit with rainproof shelter, which can hold 1000 tons of oily cuttings, covers an area of about 1000m².

Expected Monthly Oily Cuttings that will be treated - ~ **60 tons per month.**

✓ **Treated cuttings storage area**

Store the treated cutting without base oil, Total area is about 1500m²

✓ **Office and living area**

Office, parking, and staff lounge area covers 700m².

✓ The power supply, road and the others

The area is nearly 1000m².

✓ Utility and power supply

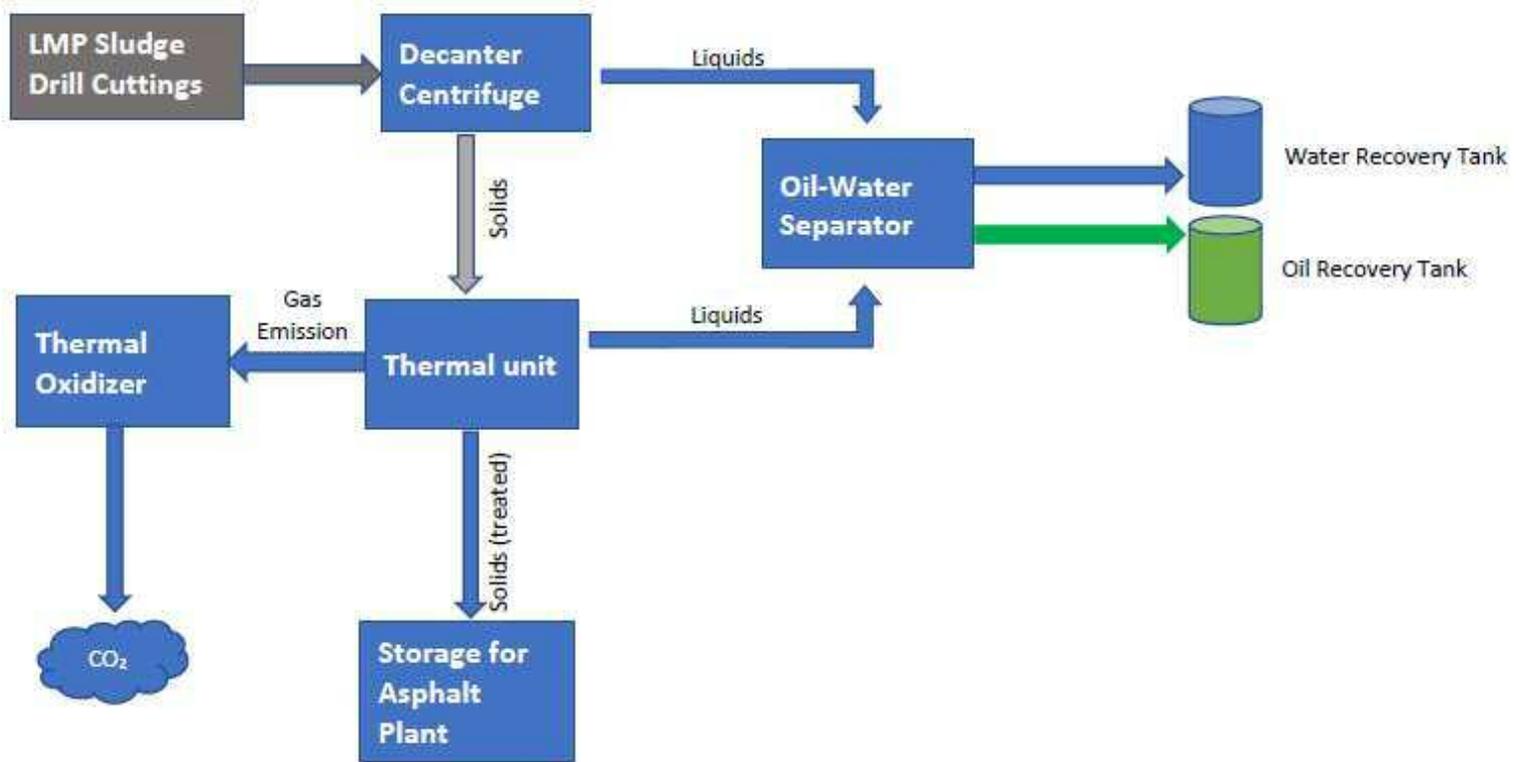
(1) Power supply: 380kV, 720kW

(2) Water supply: domestic water, daily consumption is about 2m³

(3) Gas supply: no gas supply

This video provides a detail breakdown of the operation of Oilfield Waste Management Services Company- Reconditioned Indirect TDU: <https://youtu.be/3TMCSpiEqWI>

Waste Treatment Process



OILFIELD WASTE MANAGEMENT SERVICES INC.

THERMAL DESORPTION PLANT – TREATMENT PROCESS / SYSTEM OVERVIEW

Thermal Desorption System

1. Feed System
2. Primary Thermal Desorption Unit
3. Discharge System
4. First Stage Oil Condenser
5. Second Stage Water Condenser
6. Oil-Water Separator
7. Polishing Condenser
8. Thermal Oxidizer



Thermal Desorption Plant for treating drill cuttings and oil-contaminated soils

Process Overview

Feed material will be loaded into a hopper by the plant operator. The hopper is mounted to an incline screw conveyor. The conveyor transfers the feed material to a set of knife gates, creating an airlock. After passing through the airlock, material enters the heated chamber of the primary treatment unit (PTU). The primary treatment unit is a holo-flite type screw processor that uses heated thermal oil flowing through both the screw and the jacketed outer chamber at up to 650°F to transfer heat to the material.

As feed material is processed in the PTU, vapor is collected for further processing. Clean material is discharged from the PTU through another airlock. The clean material is discharged on an incline conveyor. At the discharge point, water is added to the clean material to reduce the temperature of the clean material.

Vapor collected through the processing of the feed material leaves the PTU through process piping. Vapor is carried through to the first stage condenser. The first stage condenser is comprised of an inertial separator and condenser. Oil is condensed in the first stage. The first stage includes a tank, cooling loop, and oil spray nozzles.

Vapor continues onto the second stage condenser for final stage condensing of any remaining oils and water from the vapor stream. The material collected passes through an air-cooled heat exchanger to reduce the temperature of the collected material.

The remaining vapor passes on to a thermal oxidizer, where any remaining volatiles will be remediated. The treated solids will be used as feedstock in the bitumen plant to manufacture asphalt.

MAIN PROCESS COMPONENTS

Feed System

Incline screw conveyor with grizzly hopper and airlock.

Primary Treatment Unit

Indirect heated thermal screw processor, heated screw and outer chamber along with a thermal oil heater and natural gas fired burner, powered by an electric motor.

Discharge System

Discharge cooling incline conveyor with airlock.

First Stage Oil Condenser

Oil condenser with buffer tank, spray nozzle and cooling loop.

Second Stage Water Condenser

Water condenser with buffer tank, cooling loop, air-cooled heat exchanger and spray nozzle.

Oil Water Separator

Steel construction with coalescing media and sludge hopper.

Induced Draft Fan

Electrical fan spark resistant.

Thermal Oxidizer

Thermal oxidizer with vapor residence time of up to one second.

Electrical General

Motor horse powers and speeds are based on 480V/60hz/3-phase power input. Machine can run on 380V/50hz/3-phase by moving control transformer taps and changing supply voltage parameter on VFDs. Field wiring to be primarily heavy-duty cords. Cable trays to be provided where needed to elevate cords. Automatic control with interlocks is normal mode, manual control is also provided. Emergency stop safety provided through a dedicated safety relay. One HMI is provided with main control panel for operator control of machine.

System Specifications

Equipment indoors or outdoors	Guyana Outdoors (assumed)
Relative humidity	50% (assumed)
Process type	Remediation of drill cuttings
Material	Drill cuttings with synthetic oil-based drilling mud
Feed rate	Up to 300 tons per month
Feed temperature	60°F
Minimum solids discharge temperature	≈550°F
Moisture by mass, wet basis	12% water, 18% synthetic oil drilling mud
Combustion Air Flow rate	600 SCFM
Fuel Type	Natural Gas / Propane
Dust and Temperature Control	60 PSIG Flow Rate: ~ 120.8 gph



682 M West of the Site (Nearest Resident)

Oil Field Waste Management Services

91 M South of the Site (Nearest Resident)

908 M East of the Site (Nearest Resident)