SMITH & LOVELESS INC.

System Application

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# Meat Packing Plant Doubles Treatment Capacity FAST® with Retrofit

**Application Profile:** Madang, Papua New Guinea
**Equipment:** FAST Treatment System
**Installed:** 1995

When James Barnes Png. Pty. Ltd., a meat packing plant in Madang, Papua New Guinea, needed to increase its plant's treatment capacity, they asked Smith & Loveless' Retrofit Department to tackle the job. The company had an existing Smith & Loveless pre-enginnered wastewater treatment system, which had been successfully treating a flow of 70 $m^3$/d based on a BOD of 285 mg/L (44 lbs./day). However James Barnes Png. Pty. Ltd. needed to double that capacity.

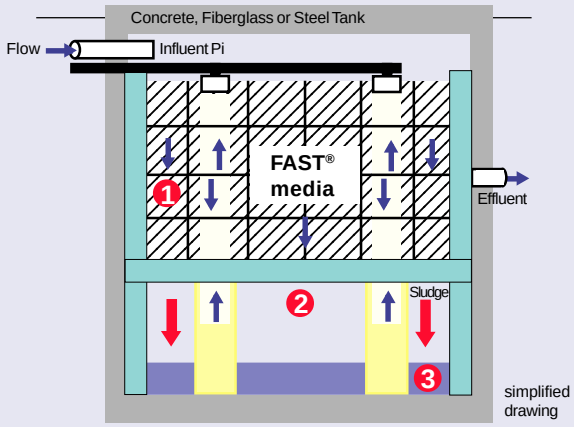
To meet the new requirements, four new Modular **FAST** modules and a new aeration tank were added to the original plant. The customer provided the 213 cm wide x 975 cm long new fiberglass aeration tank to house the new Modular **FAST** modules. Smith & Loveless specially designed the modules to fit the aeration tank. Not only were the modules designed to fit the space constraints of the new aeration tank, but they also were designed to fit through the door openings of a standard overseas shipping container. This special design made it more cost-effective to ship overseas and reduced the risk for damage during transit. The new Modular **FAST** design incorporated airlifts for aeration and mixing, as well as air scouring piping to clean clogged media.

With three treatment steps in one tank (see figure at right), the **FAST** process is an efficient alternative for expanding the capacity and/or treatment capability of an existing biological wastewater treatment system. Once the **FAST** components are installed, influent enters the system and encounters the submerged media. Bacteria become "fixed" or attached to the media, enabling growth with a higher surface area-to-volume ratio, which prevents hydraulic shock loads from washing out the microbial population. A zone underneath the media exists for the bacteria to slough off and settle for further digestion in an anaerobic environment. The result from the **FAST** is a clear secondary effluent.

The final dimensions of the Modular **FAST** modules were 183 cm high x 244 cm long with the support structure, again designed for container shipment. This combination of the new Modular **FAST** modules with the existing package treatment system has enabled James Barnes Png. Pty. Ltd. to handle a new flow of 148 $m^3$/d based on a daily BOD of 285 mg/L (93 lbs./day), more than double its original capacity.

These **FAST** *Process media modules, designed by Smith & Loveless, were inserted into the meat processer's treatment plant to expand the treatment level and capacity with minimal capital expenditure. They were specially designed for ease of shipment across the Pacific Ocean.*

## How it Works — FAST: 3 Processes in One Tank




### 1 Aeration

The air supply and draft tube creates a vigorous, even circulation of the wastewater throughout the **FAST** media.

### 2 Clarification

Rapid settling of sloughed solids from the aeration zone, keeping sludge away from the media.

### 3 Anaerobic Digestion

Anaerobic conditions enable higher life forms to further digest settled sludge, lowering the need for sludge removal.

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