ROCKY POINT SUGAR MILL

INTRODUCTION

Welcome to Rocky Point Sugar Mill. The mill started producing sugar in 1879 and is now the only privately owned sugar mill in Australia. The Heck Family has been growing cane and managing the mill through 5 family generations.

The cane growing area stretches from the Coomera River or Gold Coast North to the Logan River in the north. A complex rural drainage scheme & floodgates were installed in the 60’s and the 70’s to allow lower lying land to be more productive and keep the salty sea water out, while discharging excess rainfall. Rocky Point does not need to rely on irrigation to grow a crop each year.

The cane harvesting season runs from July to December each year, and the mill operates 6 days per week 24 hours a day for the season. Each day the mill processes about 4,000 tonnes of cane and makes 500 to 600 tonnes of raw crystal sugar.

In 2002 a new Boiler and Powerhouse, called a cogeneration plant, was installed, that allows the mill crush and produces approximately 30 MW/hr of renewable green electricity, or almost 200GWh per annum. Substantial changes were made in the mill to reduce energy consumption and maximise electrical export, and now the mill is one of the most energy efficient sugar factories in Australia.

The products the factories produce are raw sugar, electricity, molasses, ash and mill mud. The sugar goes to the sugar refinery at Harwood in NSW, the electricity is sold to the GRID, the molasses is sold for stock feed and the nearby rum distillery and the mill mud is returned to the cane field as a soil conditioner and reduces the farmer’s requirements for artificial fertilizers and saves one crop cycle normally used for a fallow rotation.

The sugarmill has been operating for over 130 years, and in this time has produced up to 435,000 tonnes of sugarcane in a season from a similar production area available today. The viability of the sugarmill is determined by this throughput, which has, unfortunately, over the years been somewhat erratic. Today we believe we are seeing a recovery to longer term annual averages between 300 – 350,000 tonnes. This is an achievable target given attention to achieving historic Cane Yield & Area Harvested from the Area Available Cane, as seen below.
Area Sugarcane Production Statistics
HARVESTING

Cane is cut up into small 300mm long billets by large cane harvesters, separating the trash from the cane stalk. Infield transporters collect the cane from the harvester and tip it into 24 tonne bins ready to be collected by trucks and delivered to the mill. The trash left behind in the field is raked allowing it to dry and baled to produce mulch used on gardens.

TRANSPORT

A fleet of 6 trucks run a just in time system to deliver cane to the mill at approximately 175 tonnes of cane per hour. Each truck is fitted with GPS and special electronic tags, so the truck can be tracked and the grower who supplied the cane can be identified and paid.

MILLING

When the cane goes into the mill it is pulverised to break open all the sugar rich juice cells in the cane.

The cane is then crushed between large rollers called mills to squeeze out the sugar juice. Rocky Point has 4 mill units to extract as much of the sugar juice out as possible, and protect the equipment.

Crushing sugar cane in a Mill
The Mill is highly automated with many different computer systems to operate the milling train as efficiently as possible.

Monitoring the cane receipts and the milling train

The Boiler and Powerhouse at Rocky Point

As nothing is wasted in a sugar mill, the fibre left over after all the juice is squeezed out called bagasse, is transported to the boiler to burn and produce steam for the mill and electrically for export. As the cane re-grows each year, bagasse is classed as a renewable fuel.

CLARIFICATION AND EVAPORATION

Juice from the milling train is limed to raise the pH to stop sugar deterioration, and heated up to 103°C. A chemical reaction between the phosphate in the juice and the calcium in the lime helps to clarify the juice and allows the mud and other impurities to settle out and a clear juice for making sugar crystals results.

Operators constantly check the quality of the juice to produce a crystal clear product
The Juice Clarifier and a close up of the windows showing the mud settling

After the mud settles in the clarifier, the mud is processed in rotary vacuum filters. These filters suck all the juice out of the mud and wash the mud cake with water. The mud is then conveyed to a hopper until it can be spread back on the cane fields.

**The Rotary Mud Filter**

The clear clarified juice is approximately 15% sugar; the water is then removed from the juice by steam and vacuum and is it concentrated to a heavy syrup by large pressure vessels called evaporators that boil out the water in the juice to a syrup that is approximately 70% sugar. This syrup is pumped to the pan stage for controlled batch crystallization. At Rocky Point, 5 stages are used and each vessel is under a lower pressure. As such 1 tonne of steam will evaporate 5 tonnes of water out of the juice. Approximately 65 tonnes of steam per hour is used to make sugar from the cane.

**CRYSTALLIZATION**

Sugar crystals are grown in vessels called pans. The pans are seeded with very small crystals and then these crystals are further grown until they reach about 1 mm in size. The mixture of sugar crystals and molasses is known as massecuite.

**Slow Moving Coils of the Crystaliser**

The operators who grow the sugar crystals are know as Sugar Boilers, they are highly skilled in their craft and it takes several years of training to be able to boil sugar effectively.

**Checking (proofing) one of the pans**
CENTRIFUGALS

After the sugar boilers have grown the crystals to the required size, the massecuite is then transferred to the centrifugal station. The centrifugals or “fugals” for short are baskets that spin up to 1000 rpm and separate the molasses from the crystals. The fugals work in batches or charges to process the massecuite. Each charge is approximately 1.5 tonnes of massecuite. Each cycle of the fugal is 2.5 minutes. Approximately 25 tonnes per hour of sugar is produced at Rocky Point.

The wet sugar from the fugals is then tumbled dried in a rotary dryer; the dry sugar is conveyed to the sugar bins waiting for the sugar trucks to take it to the refinery.

The High Grade Fugal Station

QUALITY CONTROL

In the laboratory, the chemist analyse the sugar cane for sugar content. This allows the calculation of CCS for payment of cane to growers.

Also the chemists analyse products from all stages in the production process so that the mills mechanical and process engineers are able to make changes and maximise to recovery of sugar from the cane and produce a quality product.

One of the Mills Chemists analysing pan products
The final result from sugar cane to raw sugar