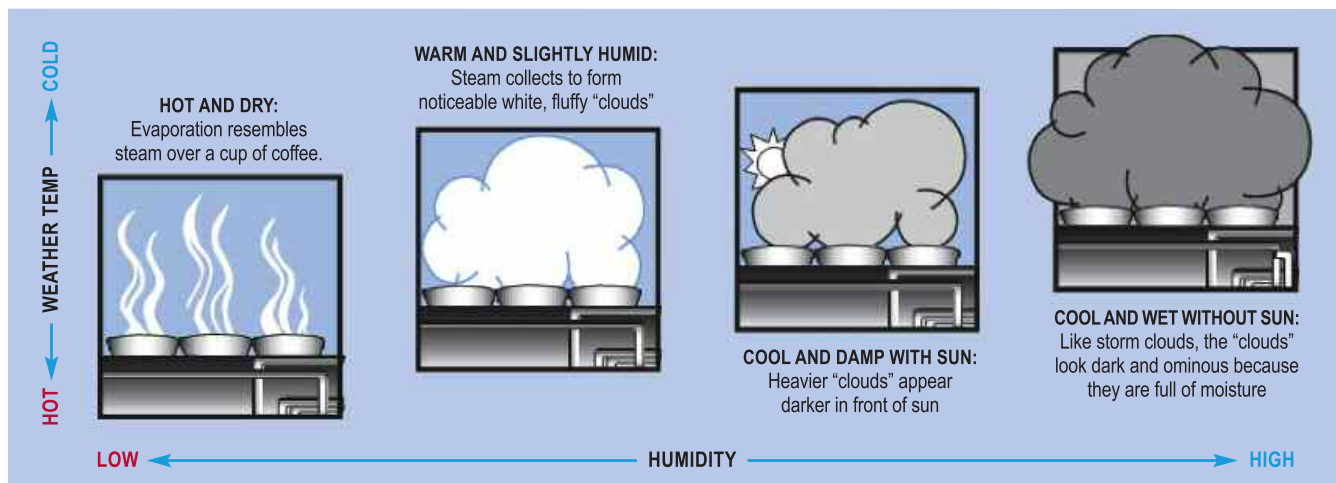


Cooling Tower Steam

The Torrance Refinery, like many other industrial operations, uses water throughout the facility to heat fluids and to cool various production units during the refining process to make clean-burning California gasoline and the quality products that our customers have come to expect in way that is safe, reliable, environmentally responsible and community friendly. We are mindful of our water usage and look to ways by which to reduce, reuse and conserve water in our operations.

In some units the water temperature reaches very high temperatures. In order to continually reuse and conserve the water, it is sent to be cooled and stored in the refinery's cooling towers located alongside Crenshaw Boulevard. Once in the cooling towers, hot water is cooled by an airstream that is blown on it as it enters the towers. Because of the temperatures involved, the cooling process causes some of the water to evaporate, while the major portion is cooled and recycled throughout the refinery. The evaporated water mixes with the airstream on its way out of the stacks at the top of the cooling towers. This mixture forms a visible "cloud" over the cooling towers. However, the only thing coming out of the cooling tower stack is the water in the form of vapor or steam, and air that cannot be retained and reused in the refining process.



This illustration depicts the look of the "clouds" coming out of the top of the cooling tower stacks based on the atmospheric conditions on a given day. Beyond the temperature and humidity of the surrounding air, the appearance of the "clouds" is also affected by the angle of the sun: if it is behind the "clouds" they appear darker. The wind also affects the appearance: on windy days steam mixes with the surrounding air more quickly.

Shape-Shifting Steam Clouds

Our 24/7 operation means that the cooling towers are constantly producing steam. The look of the steam clouds varies based on the temperature of the water entering the tower and the weather outside. When hotter water enters the cooling towers, more water needs to evaporate to bring the temperature down; therefore, more evaporated water mixes with the air and a larger steam cloud is emitted from the cooling tower stacks. Most of the time the temperature of the water entering the towers is the same, but the look of the steam cloud is affected by the weather on a given day. The water exiting the stacks also evaporates into the air at different speeds based on the temperature and humidity of the day. Water evaporates into warm air more quickly than in to cold air. On a humid day, there is already so much water in the air that it cannot absorb the steam clouds very quickly. That is why the steam clouds appear darker and heavier looking on those days.

Usually, in the winter months of December and January, the steam clouds are generally much more visible due to the cold, humid days typical of those months and are usually more visible during the colder morning hours.

A Workforce Dedicated to Responsible Operations

The Torrance Refinery is committed to safe, reliable and environmentally responsible operations. Several local agencies, including the South Coast Air Quality Management District and the Torrance Fire Department, carefully monitor the refinery's environmental performance. The refinery is held to strict regulatory standards that we strive to meet and exceed.

FOR MORE INFORMATION please call the Community Relations Team (310) 212-1852 during regular working hours or our 24-Hour Neighborhood Hotline (310) 505-3158.