

■ ENGINEERING ■ ARCHITECTURE ■ DESIGN-BUILD ■ GEOSPATIAL SOLUTIONS ■ SURVEYING



Merrick & Company was contracted to perform the detailed design, engineering, procurement, construction management, and startup support for waste-heat powered LPG recovery plant at Suncor's Denver refinery and subsequently at Giant Refining's Bloomfield Refinery. The \$3M projects were developed with funding assistance from the U.S. Department of Energy to demonstrate the first-of-a-kind system that uses low temperature (295°F) waste heat from the refinery's reformer effluent gas to achieve sub-zero refrigeration temperatures (-40°F) instead of conventional compression refrigeration. The refrigeration is applied to the refinery's fuel gas makeup stream to recover more than 180 BPD of liquid hydrocarbon products.



The process utilizes a waste-heat powered reboiler and rectifying column to fractionate the ammonia-water absorbent. An evaporative condenser is used to condense the overhead ammonia vapor and the liquid ammonia is sent to a chiller to cool the process stream. This ammonia vapor from the chiller is combined with the strong ammonia liquid from the rectifier bottoms in the absorber, and the process is repeated. The unit was skid mounted to allow for off-site fabrication and assembly of a majority of the equipment, piping, and controls.