

INNOVATION, TECHNOLOGY AND EFFICIENCY IMPROVEMENT PROJECTS

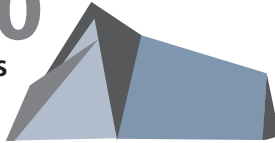
\$400+
million
INVESTMENT

7 PROJECTS
Completed in
2019

WORKFORCE COMPARISON

MINNESOTA VIKINGS
U.S. Bank Stadium project

900
workers on site during construction



FLINT HILLS
improvement projects

1000
contractors on site
NEARLY EVERY DAY




2,500
workers on site in November

RESULTS

LOWER
EMISSIONS

INCREASED
EFFICIENCY

CLEANER
PRODUCTS

IMPROVED
ABILITY
to meet
consumer
demand

AMMONIUM THIOSULFATE (ATS) TECHNOLOGY

One of the world's largest applications of Ammonium Thiosulfate (ATS) technology

Converts air pollution from motor fuels (sulfur) into **FERTILIZER** that benefits farmers and the environment



Produces ultra-low sulfur gasoline, which **LOWERS** vehicle emissions



PUTS **DOWNWARD** PRESSURE on fertilizer prices for local farmers




ATS

Annual **ATS** production expected to be **100,000** SHORT TONS


COMBINED HEAT & POWER (CHP) PROJECT

Among Minnesota's most efficient sources of electric energy generation

Produces **50** megawatts of **ELECTRICITY** using natural gas and steam



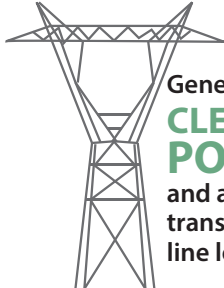
POWERS nearly **40%** of the refinery



SIGNIFICANTLY INCREASES refinery's efficiency



Generates **CLEANER POWER** and avoids transmission line loss




SAVES ABOUT 400,000


gallons of water use per day compared to traditional systems



MODERNIZED COOLING TOWERS

Allows the refinery to more efficiently control its ability to rapidly heat and cool refining products

REDUCES
water use by
↓ 15
million
GALLONS
ANNUALLY

 **10%**
REDUCTION
in ENERGY
consumption

NEW GAS OIL FRACTIONATOR



Built in
CAMBRIDGE
Minnesota

Weights 
670,000 lbs.

TRANSPORTED
60 miles




TO PINE BEND REFINERY

Improves 
REFINING EFFICIENCY
to meet consumer product
DEMANDS

NEW HEATING ELEMENTS

TWO NEW HEATERS
state-of-the-art

PROVIDE 80% 
REDUCTION
in NOx emissions over former 1950s heaters

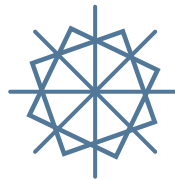
TOTAL
NOx EMISSIONS
REDUCTION of more than

13% 

CONVERTS
asphalt-like material
to
GASOLINE &
DIESEL FUEL



WESCOTT PROPANE STORAGE TERMINAL



EFFICIENT
PROPANE
inventory management
especially in winter – when demand is highest

INVER GROVE HEIGHTS STORAGE TANKS

UPGRADED
storage
TANKS



EFFICIENT
PRODUCT
inventory management
even during maintenance periods – to meet consumer demand during reduced operations