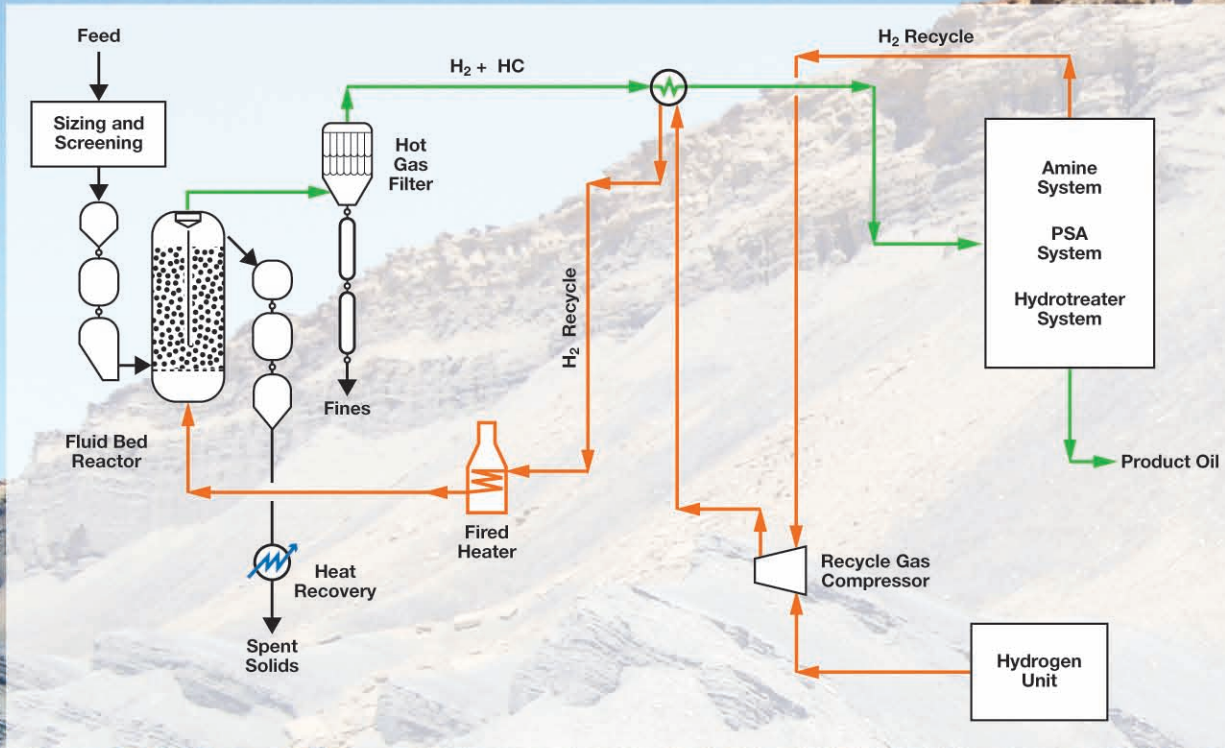


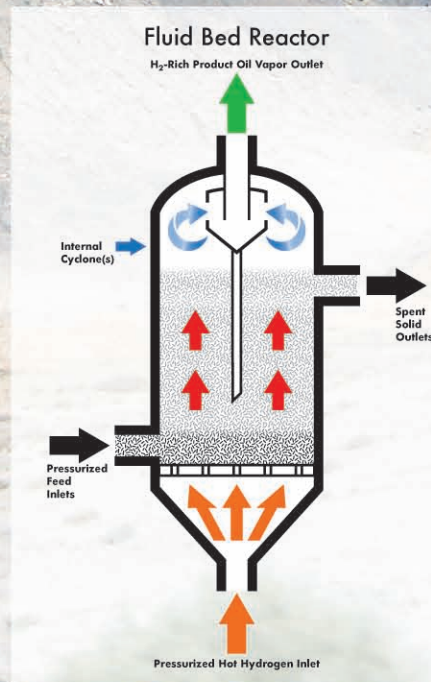


Chattanooga Process



ENVIRONMENTAL BENEFITS

- Minimal emissions, capability to remove CO₂
- Minimal water requirements
- No process waste water discharge
- Efficient use of spent solids
- No tailings pond required



FEATURES

- Shale, sands, heavy oil feed stocks
- Fluid bed reactor
- Hydrogen atmosphere in reactor
 - Fluidizing medium
 - Reactant and upgrader
 - Heat conveyor
 - Greater cycle efficiency
- Proven sub-processes
- Continuous operation
- Patented

FLUID BED REACTOR

- Temperature less than 1000°F/537°C
- 600 psig operating pressure
- Low residence time
- No combustion

PRODUCT QUALITY

- 36° - 40° API
- < 20 ppm sulfur content
- Stable and saturated
- Pipeline quality