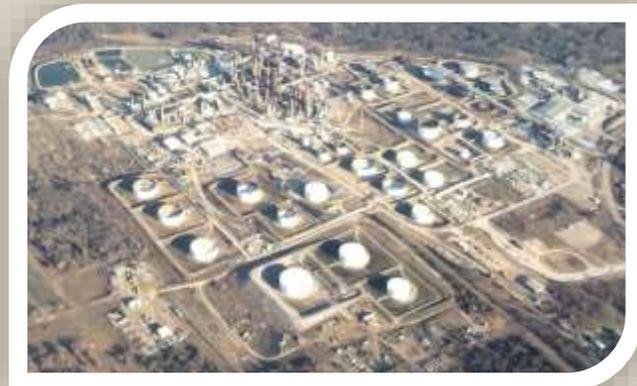
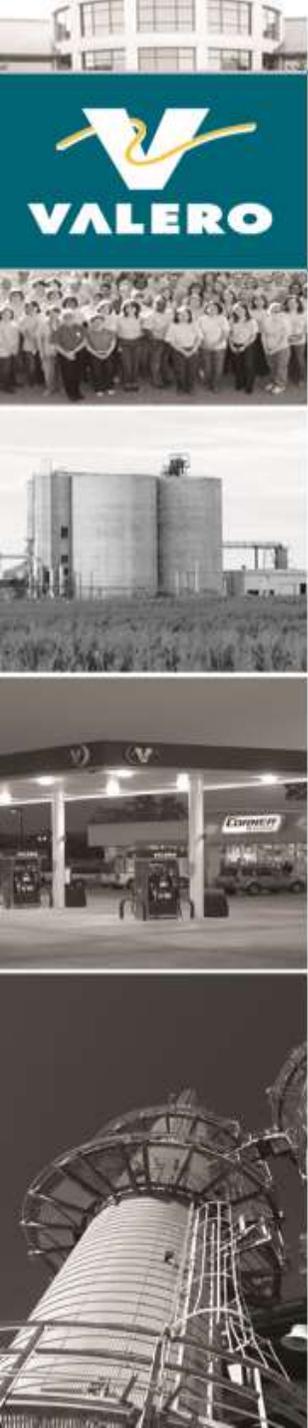


**Valero Ardmore Refinery
Waste Reduction Project -
Frank Condon Award**





Valero's Guiding Principles

To appreciate a company's true value, you have to understand the **HEART OF ITS PEOPLE.**



American Fuel & Petrochemical Manufacturers presents the 2015 Elite Silver Safety Awards to Ardmore Refinery for performing in the top 5 percent of member refineries

Guiding Principles:



Safety

Safety is our foundation for success.



Environment

We produce environmentally clean products and are committed stewards of the environment.



Community

We share our success with the communities where we live and work through volunteerism, charitable giving and the economic support of being a good employer.



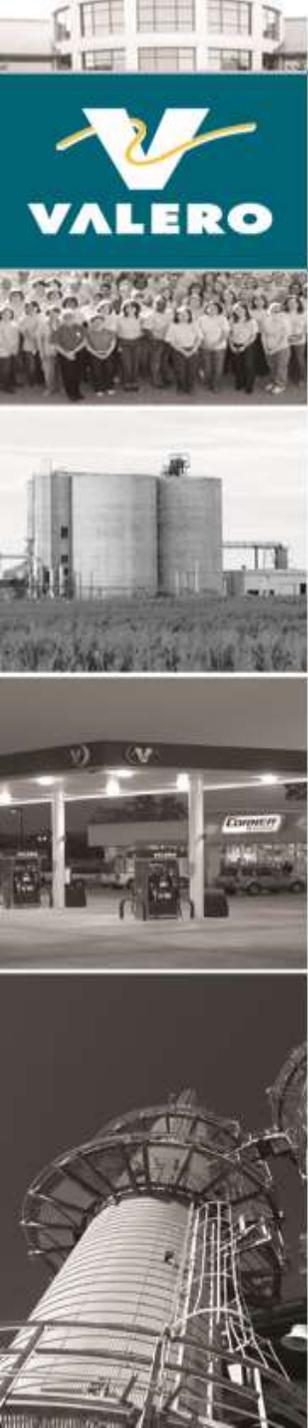
Employees

We consider our employees a competitive advantage and our greatest asset. As such, we provide them with a safe and rewarding work environment with opportunities for growth and personal development.



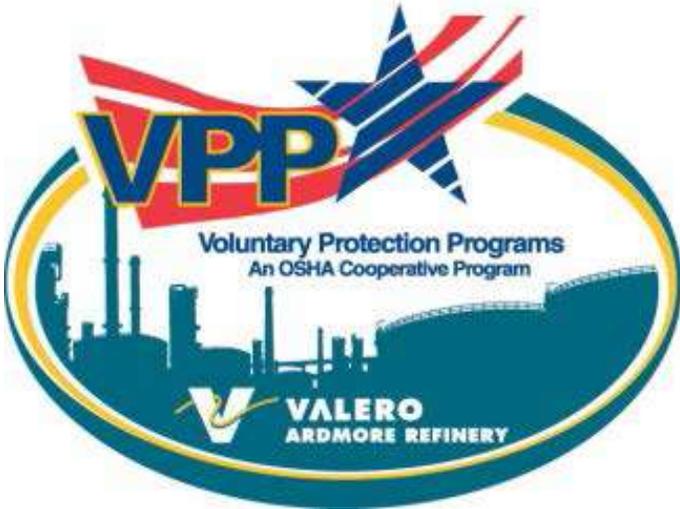
Stakeholders

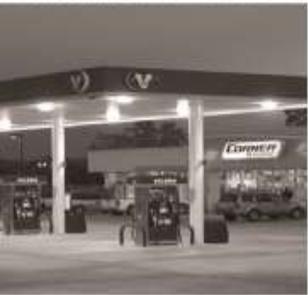
Our stakeholders are our partners to whom we pledge to deliver operational excellence, disciplined management of capital and long-term value.



Commitment to Safety

- Valero's Ardmore refinery is the only Oklahoma refinery designated by OSHA as a VPP STAR Site.
- The Ardmore refinery earned its initial VPP STAR Site certification in 2004 and was recertified in 2007, 2010 and 2014.
- Management is committed to continuous improvement as we mentor others, both at our site and elsewhere, and deploy more programs recognized by OSHA as "best practices."
- Recognized by Valero as the company's top environmental performer (2013) and safety performer (2014).





Commitment to Environment

- Valero's top environmental performer 2013.
- 2015 completed projects to comply with the new EPA Subpart Ja standards.
- June 2016 completed new OPDES project to further treat FCCU wet gas scrubber effluent water.
- In compliance with clean fuels specifications:
 - FCC charge desulfurized to allow refinery to meet Valero gasoline sulfur requirements.
 - Benzene is saturated in the Bensat unit to meet federal air toxic regulations.
 - Hydrocracker added in 2006 to produce 100% of finished diesel product as ULSD
 - **+\$100,000,000 new Gasoline Desulfurization Unit (GDU) scheduled to be built by 2019 to meet new Tier 3 gasoline specifications.**



Gasoline Desulfurization Unit reactors; similar to what is planned to be installed at Ardmore by 2019.



Hydrofluoric Acid Alkylation Unit

- Refineries are a Complex Chemical Plant
- 30% of crude oil is immediately useable
 - After removing sulfur
- 70% must be upgraded
 - Break big molecules into smaller
 - Recombine as appropriate



- Alkylation Units Combine C4's into C8's
- Perfect gasoline blend component
 - High octane
 - No sulfur
 - No benzene



Heavy Waste Oil Byproduct

Previous

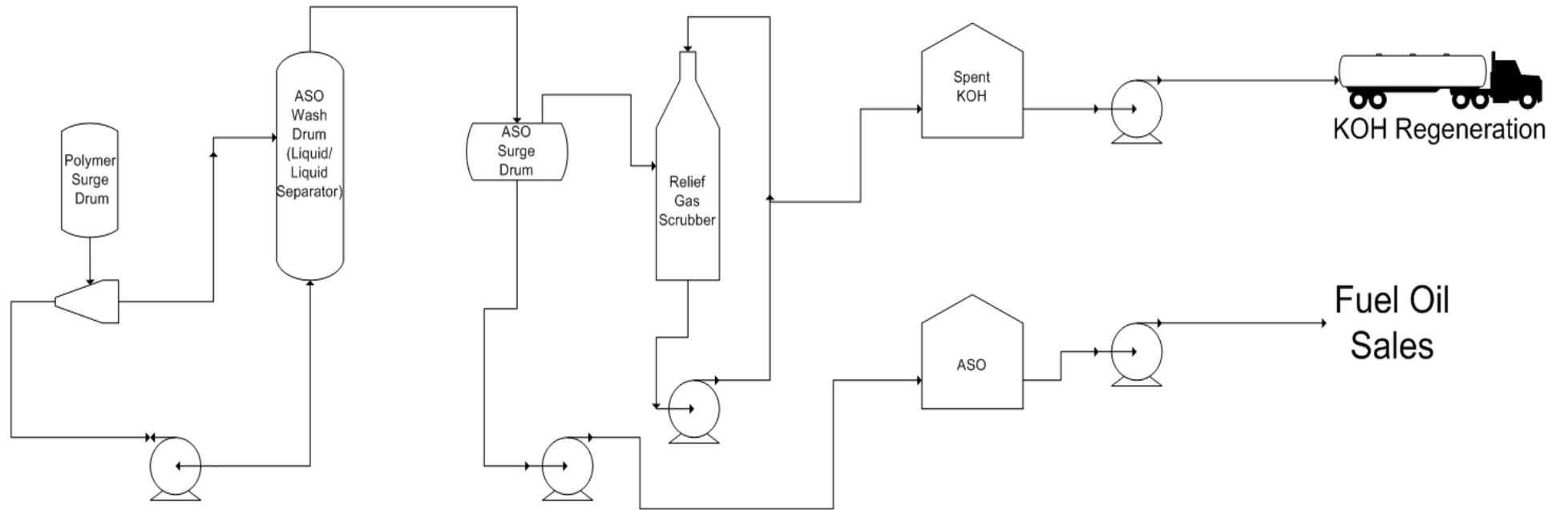
- Acid Soluble Oil (ASO)
- Azeotrope formation
 - Cannot separate with distillation
 - Phase separate in surge drum
- Manually drained to a lined, covered pit.
 - Contacted with a lime slurry
 - Sent to waste water for treatment
 - Contained trace amounts of HF
 - Difficult to biologically treat (KF)
 - Plugged sewers
 - High maintenance costs
 - Hazardous waste disposal

Current

- Phase separate in surge drum
- Manually decant to a totally closed system
- Circulating KOH solution educts ASO from surge drum
- ASO intimately mixes with circulating KOH



Block Flow Diagram





Project Benefits

Reduction

- Employee Exposure
 - SCBA
 - Hot protective wear
 - Noxious odors
- Hazardous Waste
 - 40% reduction in FO37 waste
 - One million pounds
- Economic
 - \$1.3MM transportation and disposal costs
 - \$0.7MM/yr operating costs

Addition

- Waste oil converted to saleable product
- Spent KOH sent for reclamation and returned to Ardmore



Questions?

