



**Process Solutions
Oily Waste Processing
and
Coker Injection Technologies**


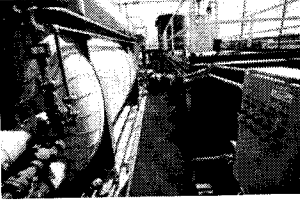

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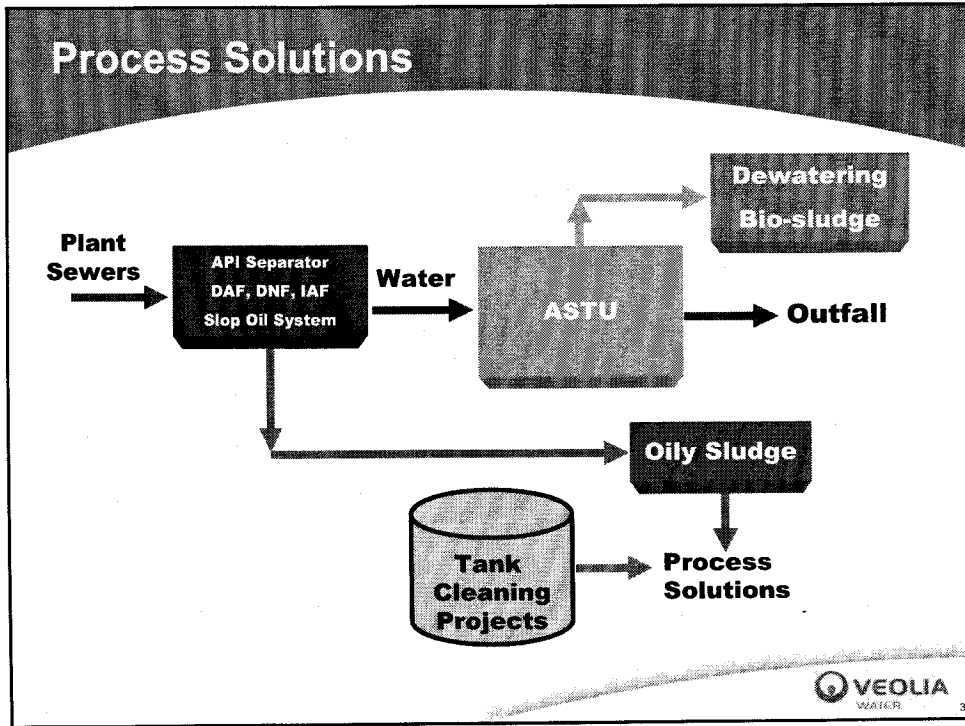


Process Solutions

▶ Who we are...

- Leader in On-site Refinery Waste Processing with 28 Long-term DBOOM Projects
- Veolia Environment has >250,000 Employees Worldwide
 - With >28,000 Employees in North America
- Revenues Exceeding \$33.6 billion
- Publicly-traded on the NYSE



Process Solutions

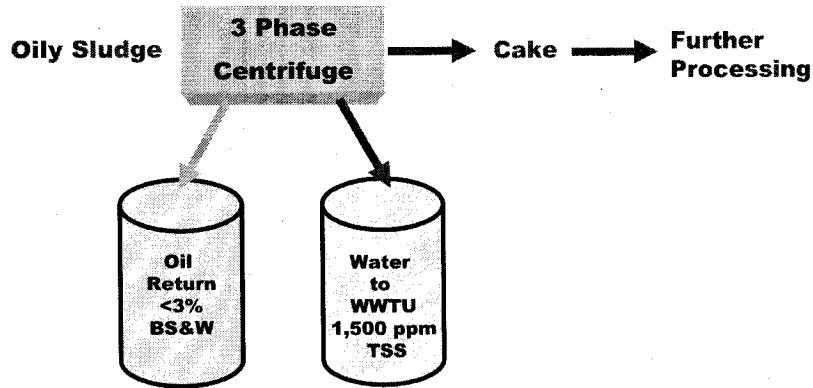
- ▶ Refinery Oily Sludges
 - K048 – 052
 - F037 – 038
 - K169 – 170
 - Desalter Emulsions (Brine Emulsions)
 - Tank Cleanout (In-process Capacity Restore)
 - Spill Clean-up
 - WAS (Bio-sludge)

- ▶ Chemical Plant Sludges
 - Ethylene Plant Sludge
 - Catalyst Recycle
 - Product Recovery

VEOLIA
WATER

Process Solutions

► First Stage Waste Reduction



Process Solutions

► Cake Process

Basis: 1000

bbl Feed

Solids Capture = 90%
 Feed Density = 8.3 lb/gallon
 Oil Density = 7.5 lb/gallon

Feed Composition:	5%	Solids	17,430	pounds
	15%	Oil	52,290	pounds
	80%	Water	278,880	pounds

Solids Captured = 15,687 pounds

Centrifuge to Produce Cake

Cake Produced = 39,218 pounds

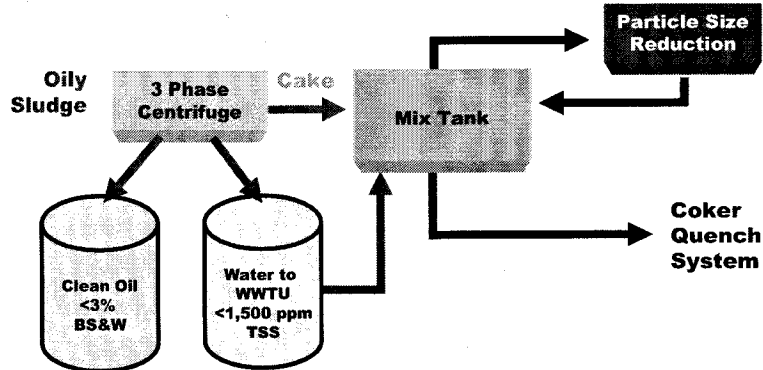
Cake Composition:	40%	Solids	15,687	pounds
	10%	Oil	3,922	pounds
	50%	Water	19,609	pounds

Oil returned = 48,368 pounds or 154 bbl



Process Solutions

► Coker Quench Process



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Process Solutions

► Coker Quench Process

Basis: 1,000 bbl Feed

Cake Produced = 39,218 pounds

Cake Composition:	40%	Solids	15,687	pounds
	10%	Oil	3,922	pounds
	50%	Water	19,609	pounds

Coke Produced = 2,000 tons per day

Allowable solids addition = 1% of coke made = 20 tons of solids per day

Quench Slurry Composition	15%	Solids	15,687	pounds
	4%	Oil	3,922	pounds
	81%	Water	84,971	pounds

Quench Slurry Density = 8.6 lb/gal

Total Quench Slurry = 104,580 pounds = 12,160 gallons = 290 bbl



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Process Solutions

► Coker Quench Process

- Summary Points

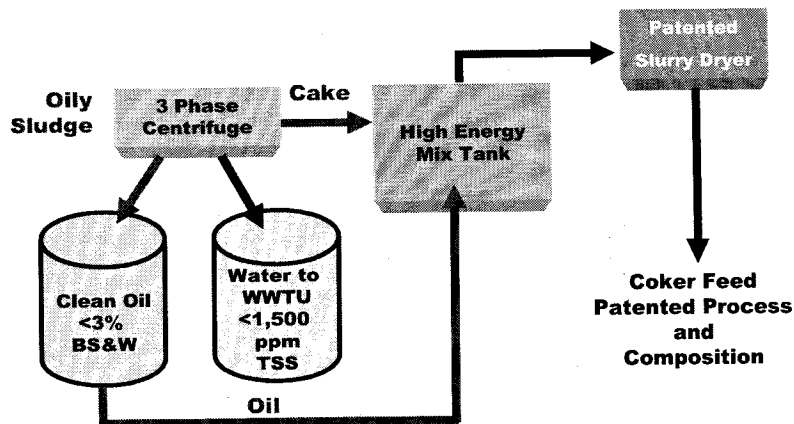
- Injecting In-place of a Portion of the Quench Water
- Quench-side Injection
 - Started Immediately After Drum Steaming
 - Has to be Discontinued when Overhead Temperatures Decreases to 550°F - 600°F
- Particle Sizing to An Average of <100 Microns, for Even Distribution Through the Coke Bed
- Slightly Lower Processing Cost than Feed-side Injection without the Addition of a Slurry Dryer



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Process Solutions

► Coker Feed - Scalfeed™



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Process Solutions

► Coker Feed - Scalfeed™

Basis: 1000 bbl Feed

Cake Produced = 39,218 pounds

Cake Composition:	40%	Solids	15,687	pounds
	10%	Oil	3,922	pounds
	50%	Water	19,609	pounds

Adjust oil to solids ratio to produce dry fuel

Scalfeed Composition:	45%	Solids	15,687	pounds
	52%	Oil	18,127	pounds
	3%	Water	1,046	pounds

Scalfeed Produced = 34,860 pounds = 83 bbl (recycled in coker)

Oil to add:	18,127	pounds oil required
	-3,922	pounds oil in cake
	14,205	pounds oil to add
	45	bbl oil to add

Oil returned = 34,163 pounds or 108 bbl



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Process Solutions

► Scalfeed Process

• Summary Points

- Scalfeed is Added during the Coking Cycle at a rate of 30- to 70-gpm
- Scalfeed is Either Introduced through a Quill in the Upper 1/3 of the Drum, or it May be Mixed Directly to the Coker Feed
- Scalfeed is Introduced at a Low Feed Rate and Low Water (3%)
- Ash Increases of 0.2% to 0.7% are to be Expected
- There is No Chance of Odors or Hotspots when the Drum is Deheaded.
- Wide Timing Window for Introduction of Scalfeed.
 - It may be added at any time after 1 hour of starting the coking cycle to 1 hour prior to ending the coking cycle.
- Scalfeed Allows for 35%-45% Solids Loading
 - Greater solids loading translates into less waste volume going to the coker than quench side injection.



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Comparison of Coker Quench Injection & Scalfeed

Process	Oil Used (bbls)	Oil Returned (bbls)	Solids to Coker (lbs.)	Total Volume Sent to Coker (bbls)
Coker Quench	12 (mostly entrained)	154	15,687	290
Scalfeed	58	108	15,687	83

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