

OIL/WATER SEPARATOR DESIGN SELECTION TOP 10 LIST!

Railroad Environmental Conference

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OWSs, ...their simplicity belies their importance!

- Conceptually, OWSs are simple
- In practice, the life cycle co\$t of a poor choice cost more than the OWS
- All OWSs are not created equal
- Design selection expertise is needed!
- Example: U.S. Army bought and installed 60 wrong OWSs in one facility



Design Selection

10 *Top Ten List!*

- ① Wastewater flow rate and character
- ② OWS sizing
- ③ Grit settling and removal
- ④ Trash collection and removal
- ⑤ Laminar plug flow
- ⑥ Inlet and Outlet hydraulics
- ⑦ Coalescing media
- ⑧ Oil collection and removal
- ⑨ Sludge collection and removal
- ⑩ Maintenance

① Wastewater Flow Rate and Character

Flow Rate

- Steady flow is best
- Minimize pump on/pump off surges
- Dry weather vs. wet weather flow



Character

- What is the O&G discharge limit?
- Wastewater must not be non-emulsified (chemical or mechanical)
- Oil (Is it diesel or lube oil?)
- Locomotive sand
- Trash: ear plugs, bottle caps, plastic bags

② OWS Sizing

Don't believe the brochure or sales rep!

- Size 2 X rated capacity
- Rated capacity is based on ideal conditions
- Assume poor conditions
- Extra capacity is cheap at initial construction compared to retrofit later



Proceptor Grease Separator Sizing Chart		
Model Number	Flow Rating	
	Non-Emulsified Grease (US gpm)	Emulsified Grease from Sinks Only ⁽¹⁾ (US gpm)
GMC 50	10	2
GMC 100	20	3
GMC 150	30	5
GMC 200	40	7
GMC 300	60	10
GMC 500	100	17
GMC 750	150	25
GMC 1000 & GMC 1000(2)	200	33
GMC 1300	260	43
GMC 1500 & GMC 1500(2)	300	50
GMC 2000(2)	400	67
GMC 2600(2)	520	87
GMC 3000(2)	600	100
GMC 4000(2)	800	133
GMC 5000(2)	1,000	167
GMC 6000(2)	1,200	200
GMC 7000(2)	1,400	233
GMC 8000(3)	1,600	267
GMC 9000(3)	1,800	300
GMC 10000(3)	2,000	333

③ Grit Settling and Removal



- Grit (locomotive sand) is a RR OWS Killer
- Solids + Oil = Sludge
- Sludge plugs coalescing media
- Keep sand and solids out with BMPs
- Grit Chamber is a must! Cleaning is a must!
- Don't waste \$ on elaborate mechanized grit removal systems

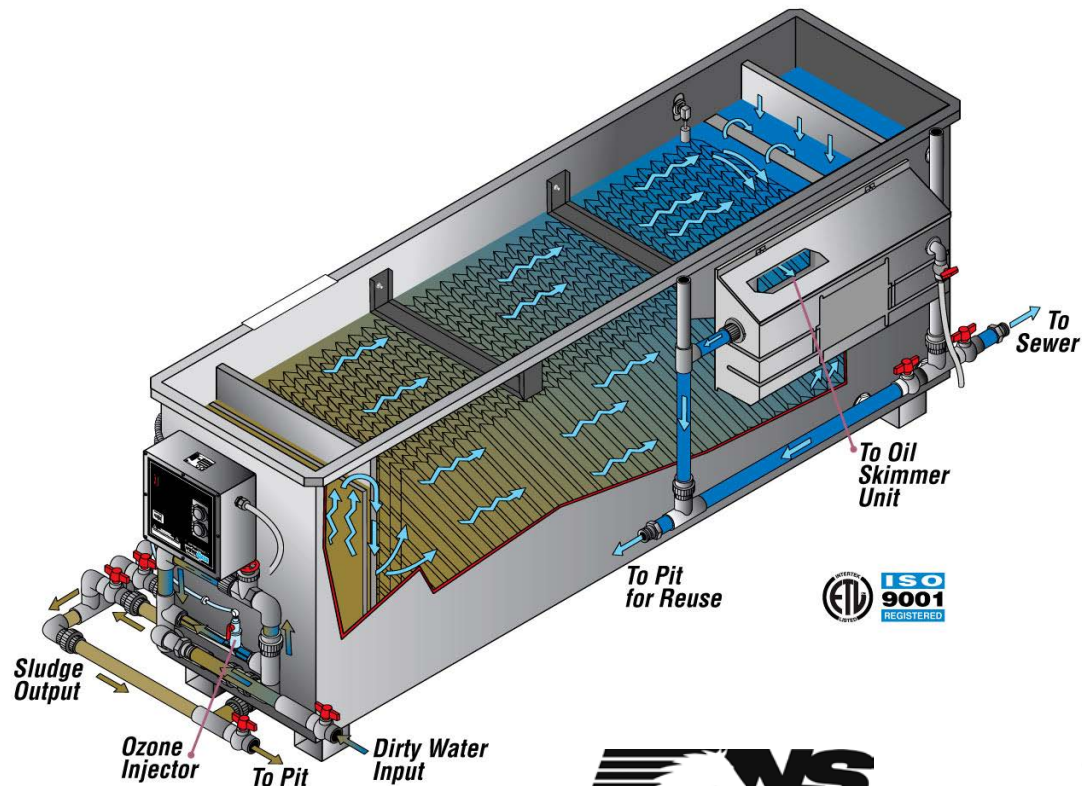
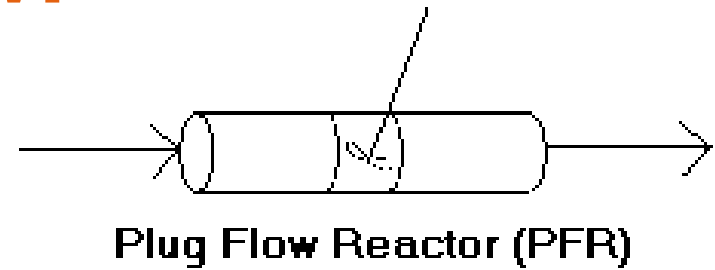
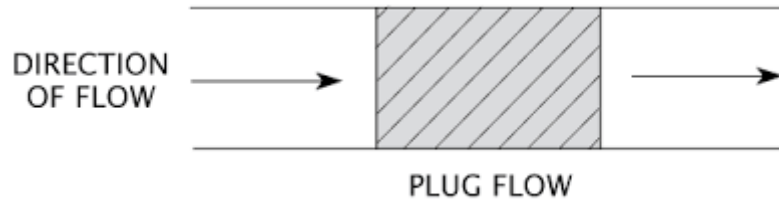


④ Trash Collection and Removal

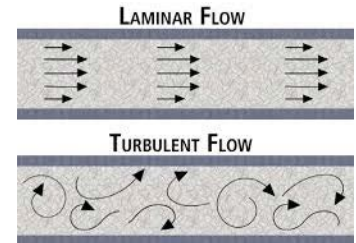


- Trash plugs coalescing media
- Trash: ear plugs, bottle caps, bottles, plastic bags, etc.
- Keep trash out with BMPs
- K.I.S.S!

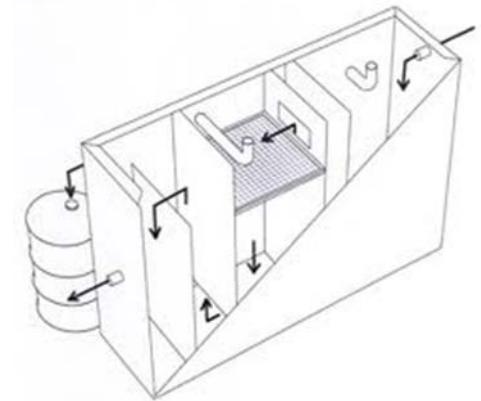
⑤ Laminar Plug Flow!



⑥ Inlet/Outlet Hydraulics



- Inlet/Outlet flow diffusion are key to laminar plug flow
- Poor inlet/outlet flow diffusion result in turbulence, short circuiting, and OWS inefficiency



⑦ Coalescing Media

- Corrugated Plate Interceptor
- “Honey Comb” corrugated Packs



⑦ Coalescing Media

- Mesh Pack
- Crossflow, Inclined flat plate



⑧ Oil Collection and Removal

- Fixed weir
- Rotating weir
- Rotating arm
- Telescoping valve
- Tube and belt skimmers
- Drum skimmer
- Floating skimmers



⑨ Sludge Collection and Removal

- Bottom drain
- Screw conveyer
- Bottom scrapper flights
- Vac truck
- Don't waste \$ on elaborate mechanical systems
- Drain and clean OWS annually



⑩ Maintenance

- Access and regular maintenance are key!
- Remove sludge
- Clean coalesce media
- Clean trash
- Clean oil from effluent chamber
- Check/repair oil removal system
- Check/repair coatings
- Check/repair instruments and controls



Questions/Discussion



Simple, Follow the Top 10 List!