

Efficient Remediation Utilizing Optimized, Low Cost Oxidizers

hepure

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Hepure Product Line

ZVI Reactive
Iron Powders



Bioremediation



Chemical
Oxidants



Metals
Treatment



Case Studies



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CHEMICAL OXIDANTS



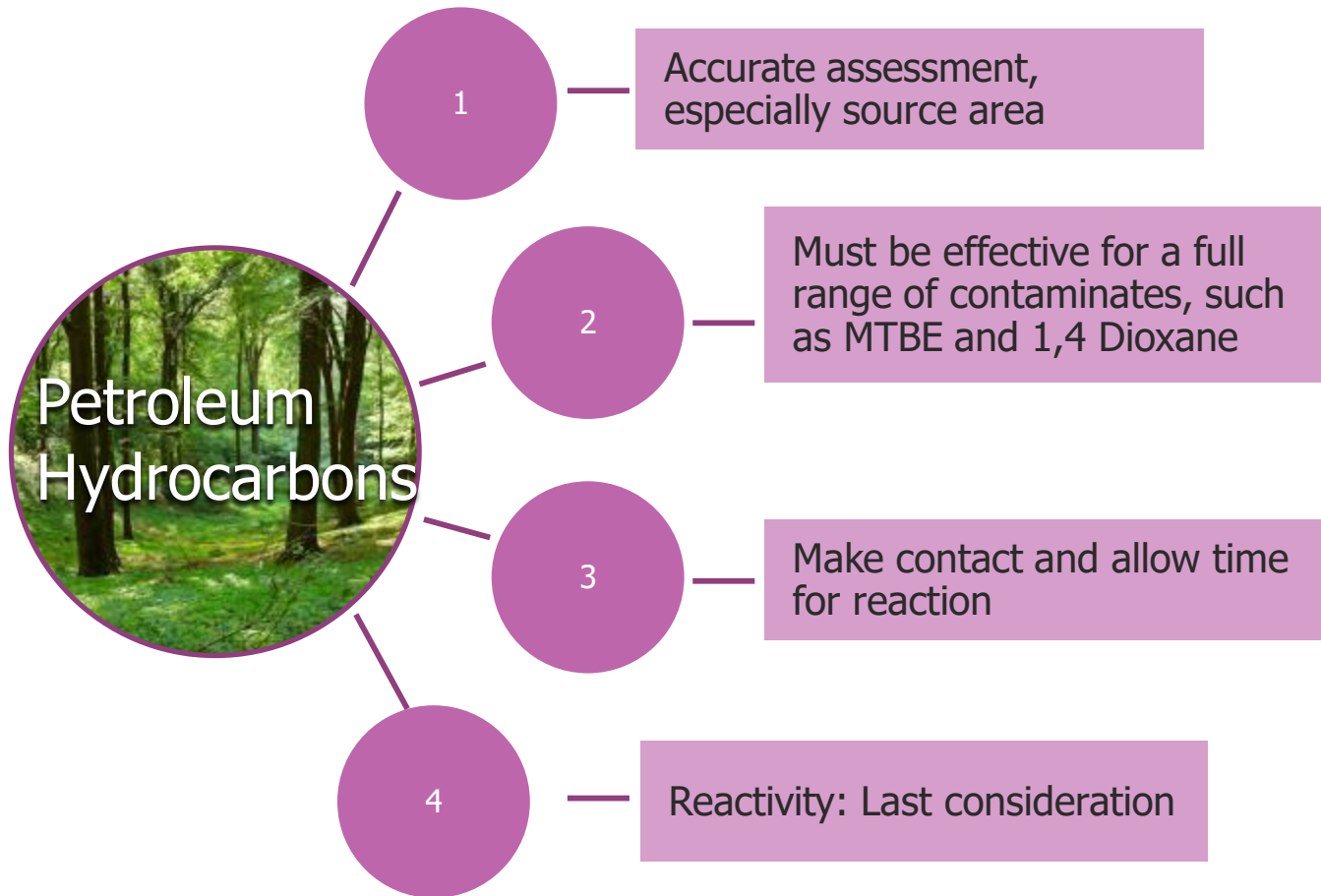
Potassium Permanganate, 97% Solid

Sodium Permanganate, 40% Solution



Hepure Pure-Ox

Successful Chemical Oxidation



BENEFITS OF Pure-Ox

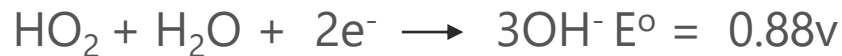
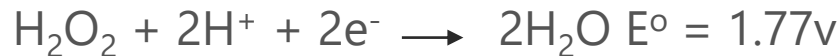
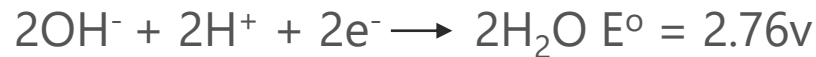


Pure-Ox Chemistry

Pure-Ox is a robust chemistry ISCO process with a high oxidation potential for contaminant destruction.

Generates high levels of hydroxyl radical, superoxide radical, and hydroperoxide anion.

Pure-Ox can destroy nearly all environmental contaminants of concern and provide enhanced treatment of adsorbed contaminants and nonaqueous phase liquids (NAPLs).

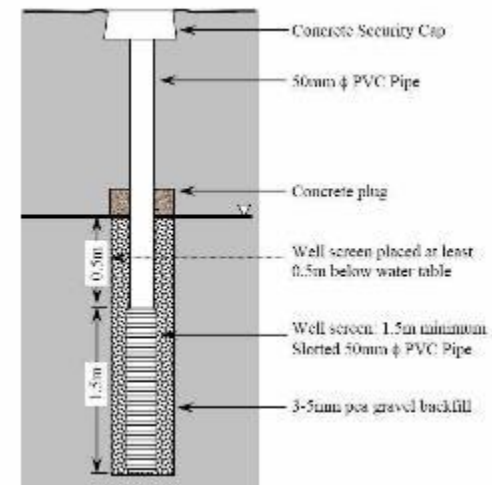
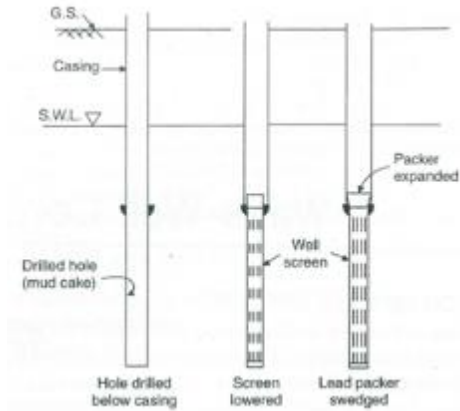
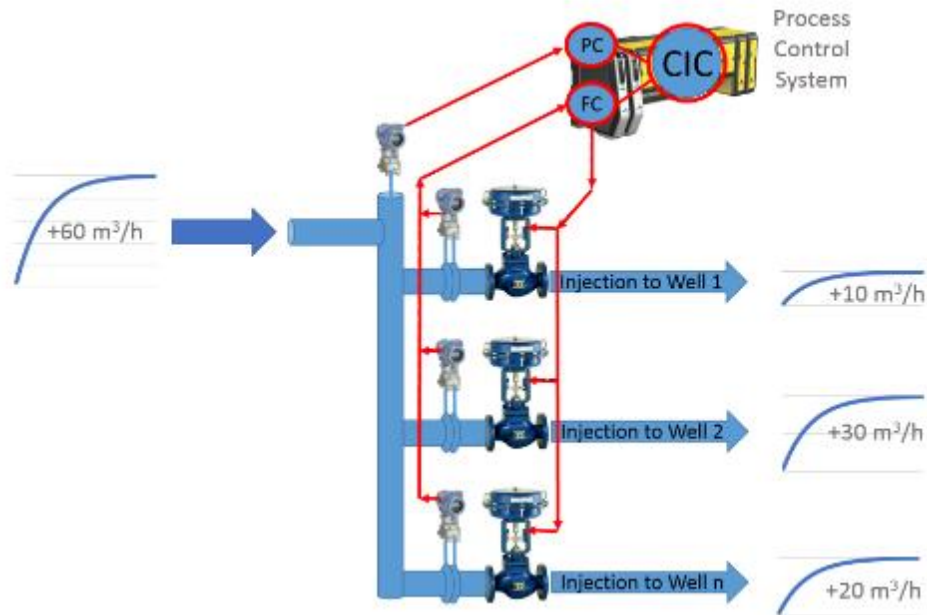


Pure-Ox Applications



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Bore Hole and Well Applications

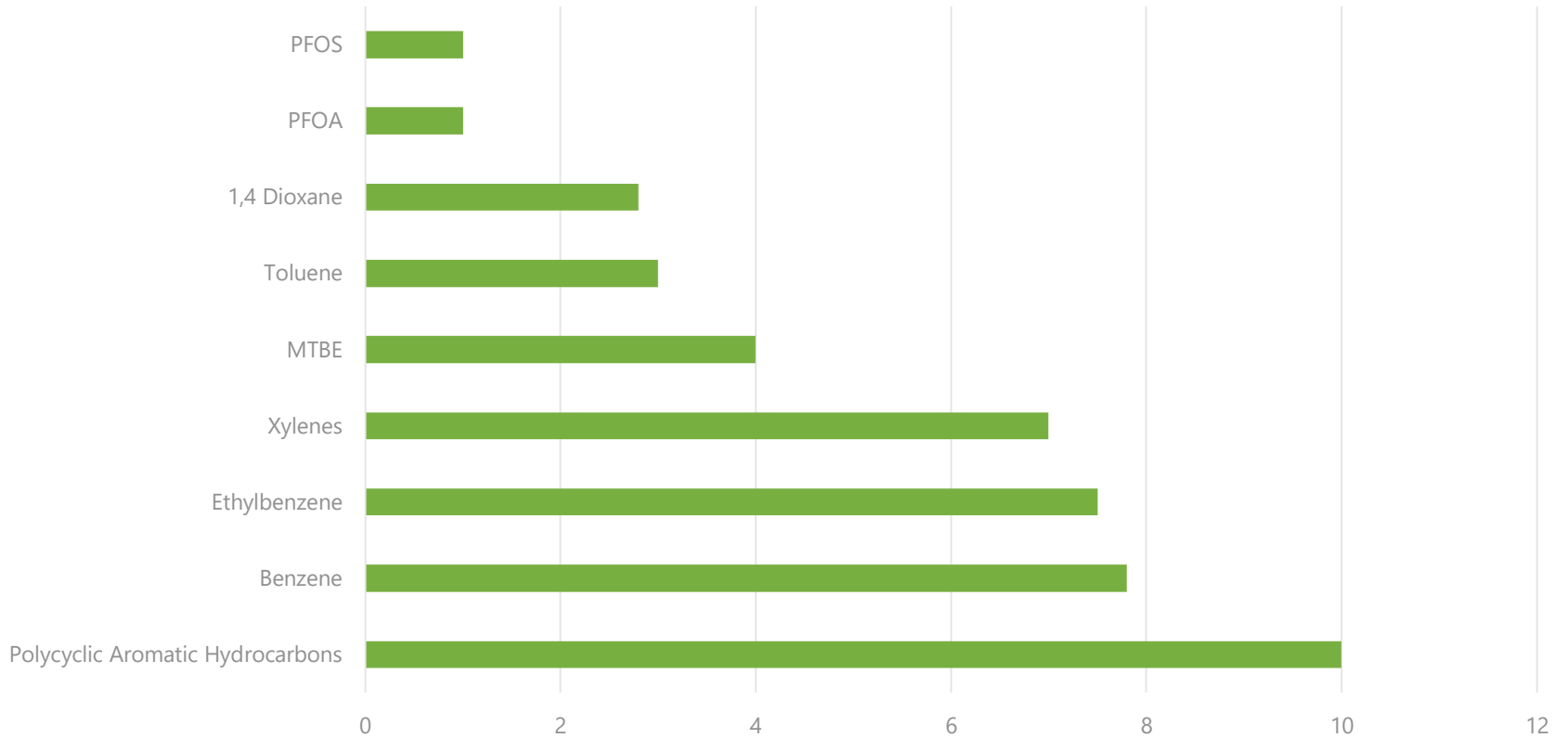


Soil Mixing Application



Pure-Ox Treatability

Relative Treatability



Pure-Ox

- ◆ Pure-Ox robust chemistry
 - high oxidation potential for contaminant destruction
 - take advantage of natural occurring catalists, iron, manganese, sulfur..

Pure-Ox Reactivity

- ◆ Pure-Ox generates high levels of hydroxyl radical, superoxide radical, and hydroperoxide anion,
- ◆ Pure-Ox can destroy nearly all environmental contaminants of concern and provide enhanced treatment of adsorbed contaminants and nonaqueous phase liquids (NAPLs).

Pure-Ox Application

- ◆ Pure-Ox is applied as a dilute solution,
 - increasing ROI and allow for
 - reactions in the vadose zone
 - chemically controlled longevity

Keys to Success

- ◆ Inject a design amount of oxidant
- ◆ Use a smaller ROI, <10'
- ◆ Direct push is better than wells
- ◆ Plan multiple events, attack source area
- ◆ Insure compatible soils, sand good, clay bad

Pure-OX AVAILABILITY

Standard
Packaging

Custom Packaging

<3000 Gallons

>3000 Gallons



55 gallon
drums



275 gallon
totes



Tanker

Hepure Product List

Hepure Technologies, Inc. Material and Chemical Supply List

hepure		Patrick Randall, P.E. Bob Kelley Ph.D bob.kelley@hepure.com pat.randall@hepure.com (866) 727-4776 x 704					
Hepure Chemical Name	Generic Product Name	Container Types	Concentration of Application	Typical Use for Remediation	Container Weight	Suggested Unit Price (lb)	Estimated Shipping 1000 Miles
Ferox PRB	Zero Valent Iron (325 µ)	Super Sack	Slurry @ 4 -10 lb/gal	abiotic reduction of solvents, precipitation of metals and nitrates	2205 lb	\$0.55	\$700
Ferox Flow	Zero Valent Iron (125 µ)	Super Sack	Slurry @ 4 -10 lb/gal	abiotic reduction of solvents, precipitation of metals and nitrates	2205 lb	\$0.75	\$700
Ferox Target	Zero Valent Iron (44 µ)	Super Sack	Slurry @ 4 -10 lb/gal	abiotic reduction of solvents, precipitation of metals and nitrates	2205 lb	\$1.20	\$700
Ferox Plus	eZVI	275 gal Tote	ready to inject	abiotic reduction of solvents, precipitation of metals and nitrates	3120 lb	\$2.05	\$800
Sodium Permanganate	40% NaMnO ₄	55 gal Drum 238 gal Tote	1% to 40% Solution	oxidation of chlorinated solvents	620 lb 2998 lb	\$2.45 \$2.25	\$700
Potassium Permanganate	KMnO ₄	5 gal bucket 42 gal barrel	1% to 5% Solution	oxidation of chlorinated solvents	55 lb 330 lb	\$2.45 \$2.25	\$550
1.5" Permanganate Candle	Potassium Permanganate	each 1.35" x 24"	Ready to Use	slow release permanganate for chlorinated solvents	5 lb	\$100.00 each	\$550
2.5" Permanganate Candle	Potassium Permanganate	each 2.5" x 24"	Ready to Use	slow release permanganate for chlorinated solvents	7.5 lb	\$200.00 each	\$550
1.5" Reusable Holder	PVC 40	each 1.5" x 24"	Ready to Use	In well deployment of 1.5" Permanganate Candle (Reusable)	2 lb	\$80.00 each	
2.5" Reusable Holder	PVC 40	each 3" x 24"	Ready to Use	In well deployment of 2.5" Permanganate Candle (Reusable)	5 lb	\$120.00 each	
Hydrogen Peroxide	30% H ₂ O ₂	55 gal Drum 275 gal Tote	2% to 20% Solution	oxidation and biological treatment of petroleum hydrocarbons	500 lb 2400 lb	\$0.40 \$0.34	\$700
Calcium Peroxide	Calcium Peroxide	55 lb bags	10 - 40 gram/L	oxygen amendment for biological treatment of petroleum hydrocarbons	55 lb	\$2.90	\$700
Remotox	Calcium Polysulfide	55 gal Drum 275 gal Tote	10 - 40 gram/L	Stabilization of Metals	583 2809	\$0.51 \$0.32	\$700
Ferrie Sulfate	Ferrie Sulfate	55 lb bags	1 - 5 gram/L	abiotic reduction of solvents, precipitation of metals and nitrates	55 lb	\$0.95	\$450
Sodium Hydroxide	25% NaOH	55 gal Drum 275 gal Tote	10 - 40 gram/L	pH amendment for anaerobic biological treatment of chlorinated compounds	560 lb 2400 lb	\$0.32 \$0.26	\$500
Renewal - SD	60% Emulsified Vegetable Oil	5 gal bucket 55 gal Drum 275 gal Tote	ready to inject	anaerobic biological treatment of chlorinated compounds	40 lb 445 lb 2,136 lb	\$1.30	\$700
DHC	Dehalococcoides Inoculum	19 L Keg	Mix w/ injectants Dilute 10 fold	microbial amendment for treatment of chlorinated compounds	1 L	\$177.00	\$290 (19L Keg)
Lactate	Lactate	55 gal Drum 275 gal Tote	ready to inject	anaerobic biological treatment of chlorinated compounds	605 lb 3025 lb	\$1.25	\$700

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