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PulseOx® APTwater's PulseOx® process is an in-situ chemical oxidation (ISCO) technology for the remediation of contaminated soil



and groundwater. PulseOx systems offer 35-50% more powerful chemical oxidation, and up to 1-billion times faster reaction kinetics than conventional air-sparge or ozone-sparge remediation systems. PulseOx systems deliver greater value through faster cleanup and closure of environmental remediation sites.

The PulseOx system is based on patented ozone + hydrogen peroxide sparge technology that produces Advanced Ox-

idation Process (AOP) chemistry directly in the subsurface. This powerful hydroxyl radical oxidation chemistry rapidly oxidizes a wide range of groundwater &[}cæ{ā}æ}c•ÈÁU}^Á][`^!~`|Áà^}^,cÁ[~Ác@^ÁÚ~|•^U¢ÁŒUÚÁ!^æ&ci[}Áā•ÁæÁc!^{^}dous increase in groundwater dissolved oxygen (DO) content which promotes natural attenuation across the site. The aggressive injection process enables rapid clean-up of highly contaminated "hot-spots" or the effective development of contaminant barriers or "sparge curtains."

PulseOx systems are available in a range of standardized sizes to suit a wide range of application needs. The self-contained and fully-automated systems allow for rapid deployment and easy operation.

The PulseOx system operates by injecting a sequence of pressurized 'pulses' of ozone, hydrogen peroxide, oxygen, and air directly into the subsurface. The injection sequence, timing, and proportions can be fully customized to assure that all chemicals and hydroxyl radicals are thoroughly distributed in the zone of contamination.

The entire PulseOx process is fully-automated. Injection intervals and volumes are set based on patented process chemistry that is customized to the type of contamination and actual site conditions. All systems are provided with full instrumentation for remote monitoring of all critical process parameters and to assure the highest level of safety. Once started, the system can provide fully-unattended '^ { ^ååæcå[}Ác[Áå}&!^æ•^Á]¦[å~&cåçåc^Áæ}åÁ•å*}å,&æ}c|^Á!^å~&^Ác!^æc { ^}cÁ&[•cÈ

System Features

PulseOx systems are provided with a number of features and advantages to best match the site conditions, contaminant and oxidant demand, including:

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Applications

The PulseOx process is ideal for the in-situ remediation of a wide range of dissolved contaminants, including:

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PulseOx process systems offer a number of operating advantages as compared to other in-situ remediation technol-

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How It Works

The PulseOx process is implemented through a series of fully-automated steps, as follows:

Injection of aqueous H₂O₃.

Step 2 Injection of gaseous O₃ and

O₂.

Step 3

Injection of high-pressure O and / or air assures complete chemical dispersion throughout the subsurface. Mounding of groundwater around the injection point provides "scrubbing" of the vadose zone.

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Step 5

Residual oxygen from the AOP process dissolves into groundwater down gradient of the treatment zone, thereby facilitating oxidation and aerobic biodegradation of contaminants in an even wider zone [~Áā}'~^}&^Dc¦^æc{^}cÈ

