RNAS REMEDIATION PRODUCTS
6712 West River Road, Brooklyn Center, MN 55430
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www.rnasinc.com

USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 98%

Newman Zone QR90

Soluble Quick Release Electron Donor – High Hydrogen Production, Low Cost

Newman Zone QR90™ is a blend of soluble electron donors, nutrients, and vitamins. QR90™ contains 90% fermentable material and produces 3X the molecular hydrogen as sodium lactate[1]. Rapid fermentation provides molecular hydrogen to quickly reduce competing electron acceptors (DO, sulfate, nitrate) and produce anaerobic conditions conducive to the *in situ* bioremediation of chlorinated solvents, chrome VI, nitrated explosives (RDX, HMX, TNT), perchlorate and nitrate. Additionally, Newman Zone QR90™ contains Nitrogen, Phosphorous, and Vitamin B12 for rapid microbial growth.

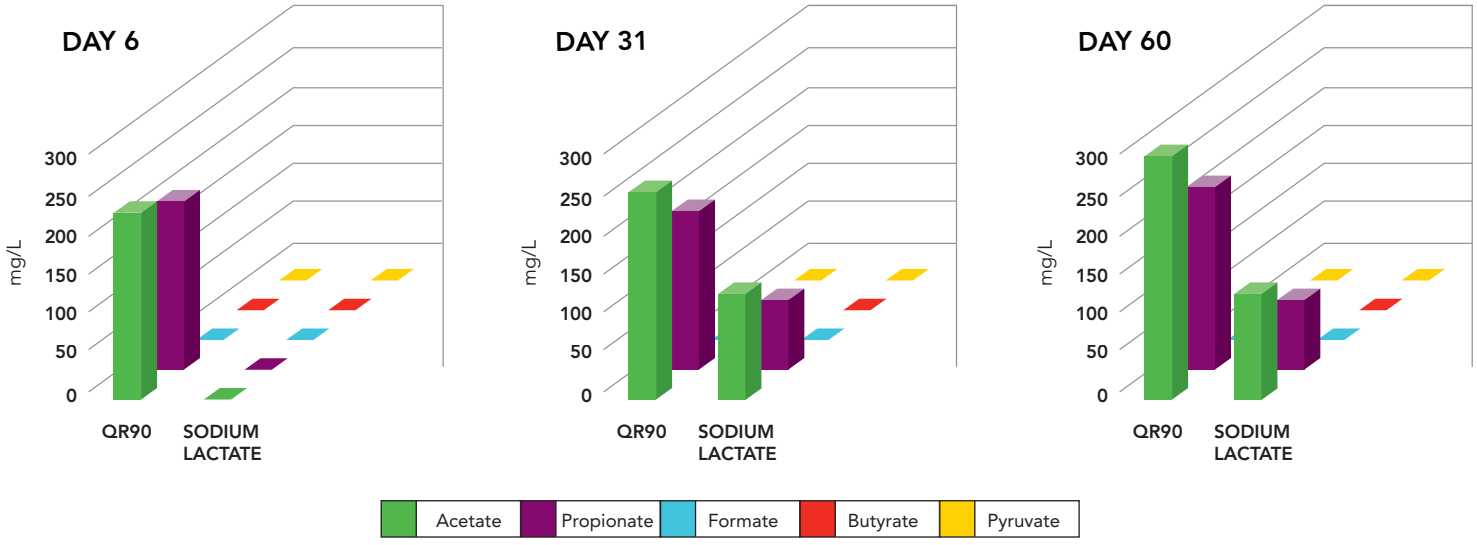
Application

Newman Zone QR90™ is diluted with water and injected into groundwater to stimulate anaerobic biodegradation. As a soluble electron donor Newman Zone QR90™ can be injected using direct push methods, injection wells, infiltration trenches, and groundwater circulation systems. Ethanol is toxic to microbes at concentrations above 20% but when diluted to concentrations of less than 5% it becomes an excellent electron donor with minimal toxicity to dechlorinating microbes (Vainberg & Steffan 2014). Newman Zone QR90™ can be pumped directly into injection wells to reduce biofouling on well screens. Optimal ethanol concentrations *in situ* are then produced in groundwater with chase water or circulation between wells. For projects that need to stimulate anaerobic biodegradation for years with a single injection event Newman Zone QR90™ should be combined with a slow release electron donor like Newman Zone 55™ or Newman Zone HRO™.

Benefits

- *Cost effective – With 3X the hydrogen production of Sodium Lactate[1].*
- *Rapid microbial growth from electron donors, Nitrogen, Phosphorus and vitamin B12.*
- *No Sodium Salts – Ideal for salt sensitive aquifers where Sodium Lactate is not an option.*
- *Low viscosity when cold (63 Centipoise at 0°C) will not freeze even at -75°C.*

A microcosm study was conducted to compare Newman Zone QR90™ with Sodium Lactate[1]. Each treatment contained 1,000 mg/L of the electron donor (wet weight), 12 mg/L of PCE and a Dhc bioaugmentation culture. Newman Zone QR90™ produced molecular hydrogen and volatile fatty acid fermentation products (VFAs) more quickly than sodium lactate and sustained higher concentrations of VFAs for each sampling event of the 60-day study.



1. Sodium lactate is sold as a 60% by weight solution. Hydrogen calculations based on the 48.2% lactate content.

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Product Content

Chemical Name	CAS Number	Composition
Glycerin	56-81-5	50-55%
Ethanol SDA-3C	200-578-6	30-35%
Urea	57-13-6	<2%
Phosphoric Acid	7664-38-2	<0.3%
Vitamin B12	68-19-9	2.5 mg/Kg
Water	7732-18	9-11%

Product Characteristics

Parameter	Unit	Specification
Density	g/mL	1.0-1.1
pH		7.0-7.5
Appearance		Pale Yellow Liquid

Packaging

This product is available in drums (450 pounds net) and totes (2,200 pounds net).

Storage

Newman Zone QR90™ is stable and may be stored for months on site at ambient temperatures. The product is easy to pump or pour even in sub-zero conditions and will not freeze at temperatures above -75 degrees Celsius.

Safety

This product is a flammable liquid at room temperature. This product may cause acute irritation to the skin and eyes with prolonged or repeated contact. Use appropriate PPE when handling this product. Newman Zone QR90™ contains SDA-3C denatured ethanol. The finished product contains less than 2% isopropanol by weight.