



Dual-Treat Bridge Ties Using The

BTX[®]

Bridge Tie Extender





Founded in 1990, Nisus is located in Rockford, TN and Supplies Products to the Professional Pest Control Industry and Wood Preservatives for the Railroad and Utility Markets.



Wood Preservation Products

- Cellutreat DOT Powder
- Cellutreat 50 Liquid DOT
- QNAP 8 Copper Naphthenate
- QNAP 2 Ready To Use Copper Naphthenate
- QNAP 5w Waterborne Copper Naphthenate
- QWIN8 Copper Eight Quinolinolate
- Mold—Care
- Bora-Care
- Jecta
- Penashield



Focus On Sustainability

- ✓ Renewable resource
- ✓ Double service life
- ✓ Recycled or Re-used

- ✓ Cost savings
- ✓ Reliable supply
- ✓ High efficacy
- ✓ Alternative preservative



Environment



Economy

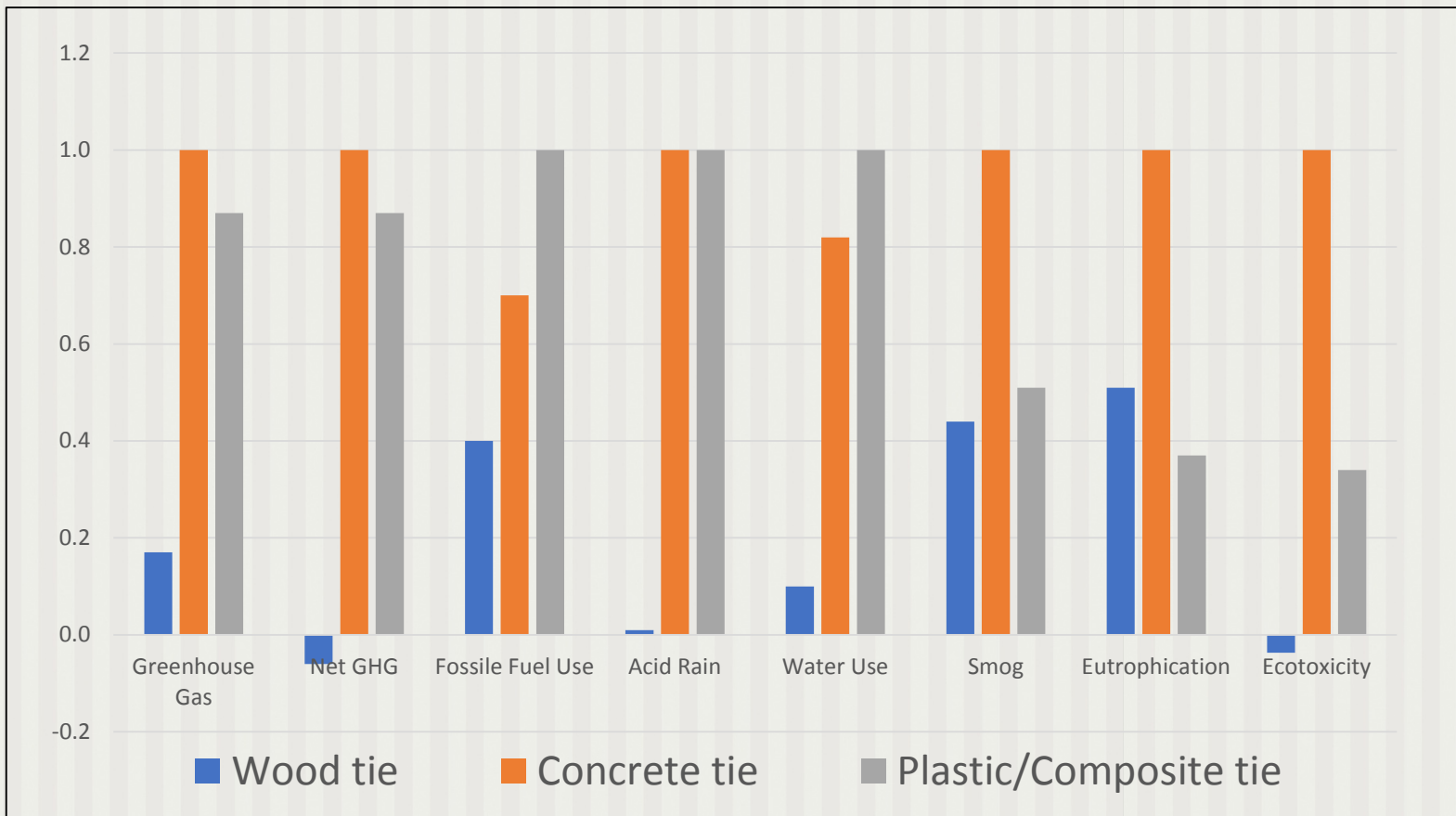


Social

- ✓ Safe & Clean
- ✓ Non-restricted preservatives
- ✓ Minimal leaching
- ✓ Made in the USA

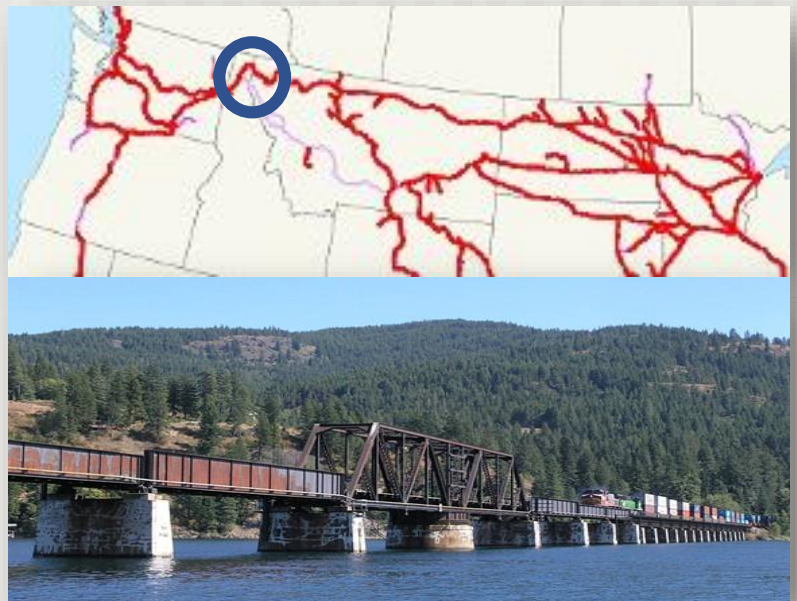


Wood is the Sustainable Choice



Bridge Tie Replacement Projects – Not a Trivial Pursuit for Railroads

- Bridges are a major bottleneck
 - Multiple roads often feed into single bridge
 - Extended out of service time while being renovated
- Each bridge tie installed cost is at least 10x that of a crosstie



BNSF, Lake Pend Oreille, ID



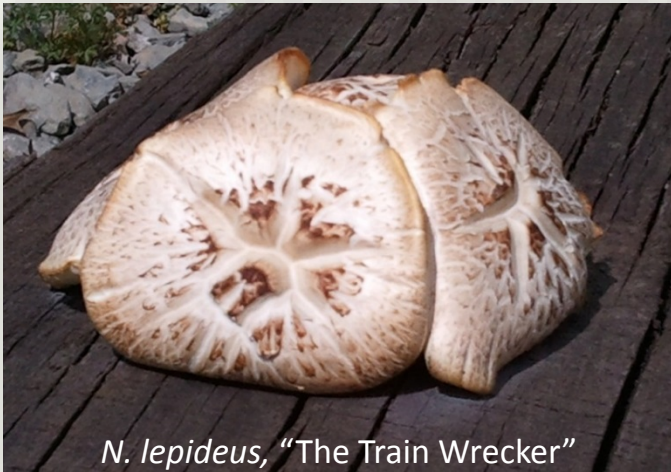
Crosstie replacement is typically automated



Manual crosstie replacement: slow, manual or labor-intensive;
presents its own set of worker safety risks;
creates a bottleneck in track maintenance

Problems with Treating Green Bridge Ties

Moisture remains at the center of the green bridge tie and the tie decays from the inside out.



N. lepidus, "The Train Wrecker"
(on a bridge tie)



— now we can
fix this





Increasing preservative retention causes it's own set of problems



and now we can fix
this too...



With the Development of

BTX[®]

Bridge Tie Extender





Drill



Fill



Plug



Pressure Treat with QNAP



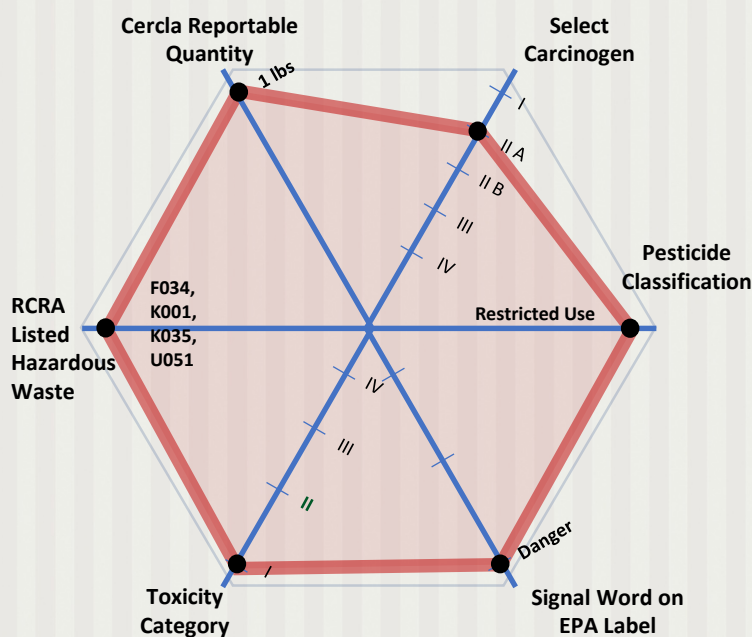


CuNap Alternative Has Clean Handling Characteristics

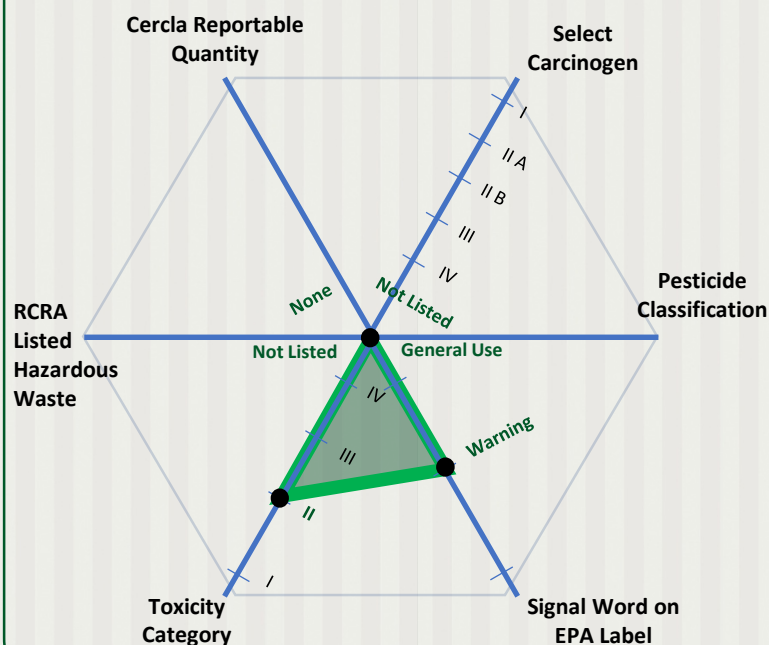


Environmental, Health, and Safety Footprint

Preservative (93.3%)



QNAP (6.3%)



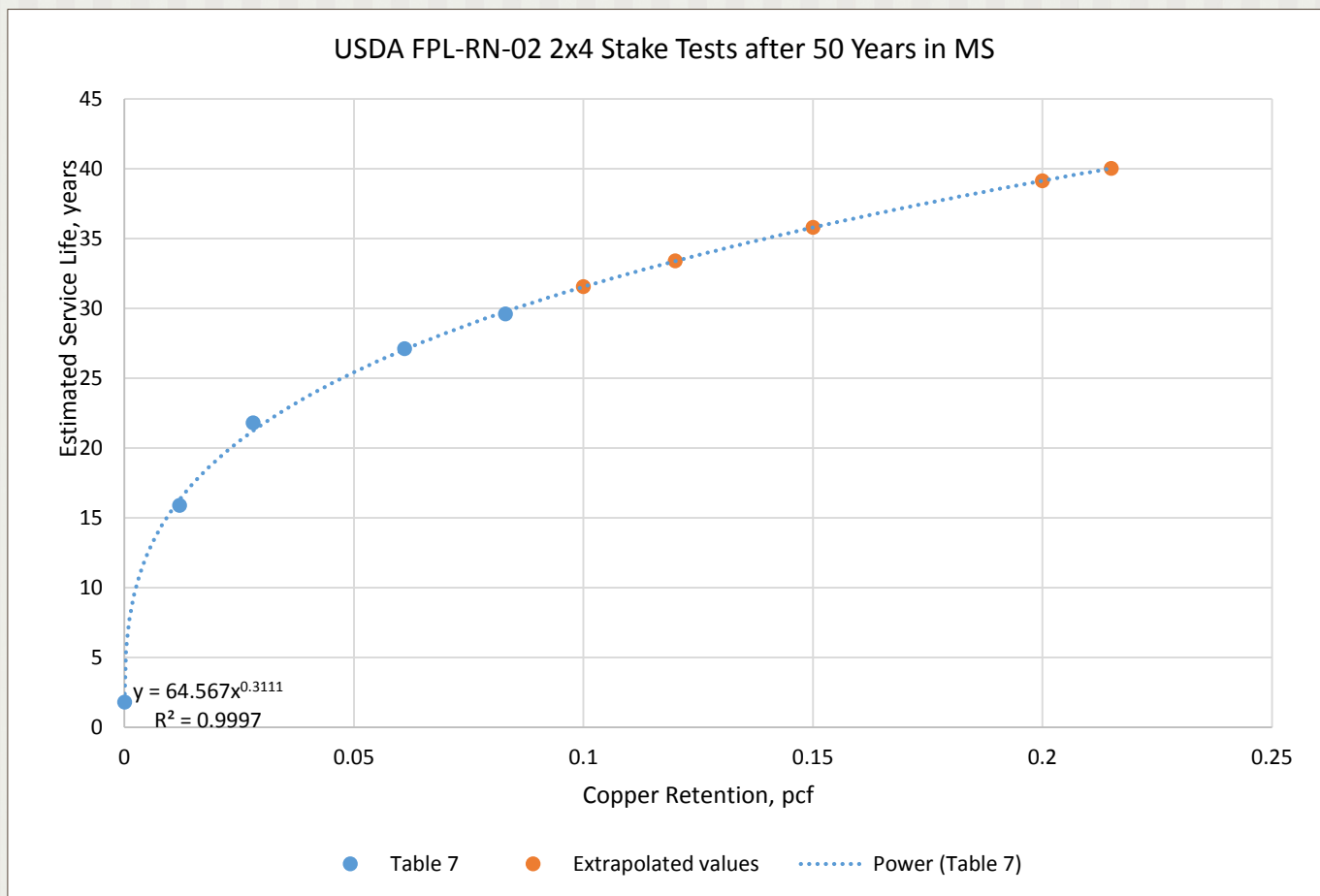


USDA Comparative Efficacy Data





Treating with copper naphthenate using a higher percentage copper gives longer life without adding more oil.





What Railroads Can Expect Based on Current Data

Current Longevity

Bridge tie installed cost ≈\$700

Bridge life of: 16 years in high hazard zones and
26 years in low hazard zones

1. Switch to Copper Naphthenate
increases tie life 30 %
2. Increased copper retention
increases tie life by 10 years
3. Borate heartwood treatment
increases tie life 20 years



Calculating the Savings (capital recovery)

Tie Treatment	Initial Cost	South			North		
		Service Life	Capital Recovery	Annual Savings	Service Life	Capital Recovery	Annual Savings
	[\$]	[years]	[\$]	[\$]	[years]	[\$]	[\$]
Stand-alone treatment							
Creosote at 8 kg/m ³ (baseline)	700	16	64.59	--	26	48.70	--
1. Copper naphthenate at 0.96 kg/m ³	698	21	54.44	10.15	34	43.11	5.59
2. Copper naphthenate at 2.4 kg/m ³	703	31	45.08	19.50	44	39.80	8.89
Dual treatment							
3. Creosote and borate	720	36	43.51	21.08	46	40.27	8.43
4. Copper naphthenate and borate	718	41	41.52	23.07	54	38.67	10.02



Which would you want?



That

or

This





Summary

- Nisus Corporation is Railroad customer oriented.
- Wood is the most sustainable material to use for ties.
- Improvements in longevity with borate have reduced overall cost in use.
- Copper naphthenate significantly improves EH & S profile and sustainability.
- The ultimate combination for bridge is QNAP + BTX with Cellutreat.
- Creates significant savings on bridge programs

QNAP®
COPPER NAPHTHENATE

BTX®
Bridge Tie Extender

CELLUTREAT®
LIQUID DOT BORATE PRESERVATIVE



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