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To: Editor of Crossties Magazine

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Subject: Borate-Creosote Alternative Crosstie Treatment Processes

This text will attempt to clarify issues raised by the use of the alternative borate dual treatments now commercially available.

As you may recall, the original borate-treated crosstie study, was a “proof of concept” project developed by Amburgey in the 1980’s to demonstrate to the railroad industry that the known preservative characteristics of borates would be of interest to both those treating and utilizing hardwood crossties. Experience with the use of borates as wood preservatives has been documented in literature reviews/bibliographies by Carr (1959), Cockcroft (1973), Drysdale (1994), Freeman (2009)<sup>i</sup>.

The hypotheses addressed in the original study were:

- (1) Treating non-seasoned hardwood crossties in a heated, concentrated aqueous borate solution, followed by a period of minimal drying to permit diffusion of borate to occur (e.g., bulk-stacked ties placed under tarps for a period of time), and then air-dried will eliminate wood deterioration by fungi and insects prior to creosote treatment.
- (2) Since wood deterioration will not occur, or will be minimal, in air-dried ties that had been treated with borate when non-seasoned, there is no need for a “sterilization cycle” during treatment with creosote.
- (3) Iron deterioration of ties (“spike kill”) will be significantly less in ties dual treated with borate and creosote as described in Hypothesis 1.
- (4) The service life of ties dual treated with borate and creosote as described in Hypothesis 1 will be significantly greater than with those treated with creosote alone, especially when used in AWPA Decay Hazard Zones 3 - 5.

The borate product used in the original study was Tim-bor<sup>®</sup> Industrial that was donated by U.S. Borax (now Rio Tinto Minerals). The results of this study were documented in Amburgey 2003, Gauntt 2006, Amburgey 2007<sup>ii</sup>.

Those who attended the RTA-sponsored field trip and meeting at Cordele, GA this spring observed that the four hypotheses of the study were proven to be correct. At that time, the borate-creosote dual-treated ties had been in active track for 24 years in AWPA high decay zone 4.

For the past 9-10 years TASKpro (Terry Amburgey and Shane Kitchens) has worked with several treating plants and suppliers to implement parts of, and develop foundation field data on, the commercialization and the creation of the “original borate dual treatment<sup>™</sup>” method. TASKpro took the technical lead on the project and has been attempting to support the commercialization on several fronts. There are many novel techniques and procedures being developed to truly replicate commercially the tie treatments produced over 25 years ago. It has been and continues to be a very complex issue due to the numerous variables that exist when converting a proof of concept project into a commercially viable wood protection system. TASKpro has been, and continues to be, committed to reproducing this “game changing” wood protection system based on science and real-life data. TASKpro is currently working to implement the remaining novel commercial techniques necessary to fully replicate the

“original borate dual treatment™” for industrial wood products. Further “fine-tuning” of the original procedure continues as TASKpro develops novel processes and materials, implements the original borate treatment in current treating facilities, explores identification systems, and expands the “borate mass effect™” theory. Once these techniques and processes are implemented, to reproduce the “original borate dual treatment™”, a final product that can fully claim the 25 year efficacy data will be available. Many of the concerns about borate treatments that have been voiced over the years are but mere challenges when the overall benefits of a properly treated borate tie are examined.

TASKpro, with dedicated industry partners, continues to move forward with the development, implementation, and commercialization of the only scientifically proven method to treat industrial hardwood products with borates. The “original borate dual treatment™” is proven and is being implemented in efficient and cost-effective ways to truly recreate the ties that are still performing after more than 2½ decades under in-track conditions. TASKpro has, and continues to be, available and willing to talk to and assist anyone wanting to implement a borate program.

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<sup>1</sup> Carr, D. R. 1959. Boron as a wood preservative. Proceedings, Annual Convention of the British Wood Preservation Association, p. 1-18.

Cockcroft, R. and J. F. Levy. 1973. Bibliography on the use of boron compounds in the preservation of wood. Journal, Institute of Wood Science, No. 33 (6)3:28-37.

Drysdale, J. A. 1994. Boron treatments for the preservation of wood – A review of efficacy data for fungi and termites. International Research Group on Wood Preservation. IRG/WP 94-30037. pp. 21.

Freeman, M. H., C. R. McIntyre, and D. Jackson. 2009. A critical and comprehensive review of boron in wood preservation. Proceedings, American Wood Protection Association. 105:279-294.

<sup>2</sup> Gauntt, J. C., T. L. Amburgey, and S. C. Kitchens. 2006. Decay in wood ties: Problem solved? How application of proven preservative technology may eventually eliminate biological deterioration as a failure mechanism. Proceedings, American Wood Protection Association 102: 155.

Amburgey, T. L., J. L. Watt, and M. G. Sanders. 2003. Extending the service life of wooden crossties by using pre- and supplemental preservative treatments. 15 year exposure report. Crossties, MAY/June. P. 10, 12, 14-16.

Amburgey, T. L. and M. G. Sanders. 2007. Borate pre-treated crossties...A 20 year field test. Proceedings, American Wood Protection Association 103:109-111.