FOREST AND WILDLIFE RESEARCH CENTER

DEPARTMENT of SUSTAINABLE BIOPRODUCTS

Fourteenth Annual Evaluation of MSU/RTA Alternative Preservative Study

Submitted To:

Dr. Nate Irby
Executive Director
Railway Tie Association
131 Woodstone Drive
Vicksburg, MS 39183
Email: nirby@rta.org

Submitted By:

M.G. Sanders and C. E. Stokes
Department of Sustainable Bioproducts
Box 9820
Mississippi State, MS 39762
Phone: (662) 325-8097
Fax: (662) 325-8986
Email: mgs3@msstate.edu

August 22, 2022

Fourteenth Annual Evaluation of MSU/RTA Alternative Preservative Study

This report covers the fourteenth annual evaluation of the full-length crossties exposed as part of the MSU/RTA alternative preservative study. A visual evaluation of the exposed top surface was conducted for all ties at both exposure sites. One tie from each treatment/research group was chosen at random and evaluated on all four faces and segmented for internal evaluation.

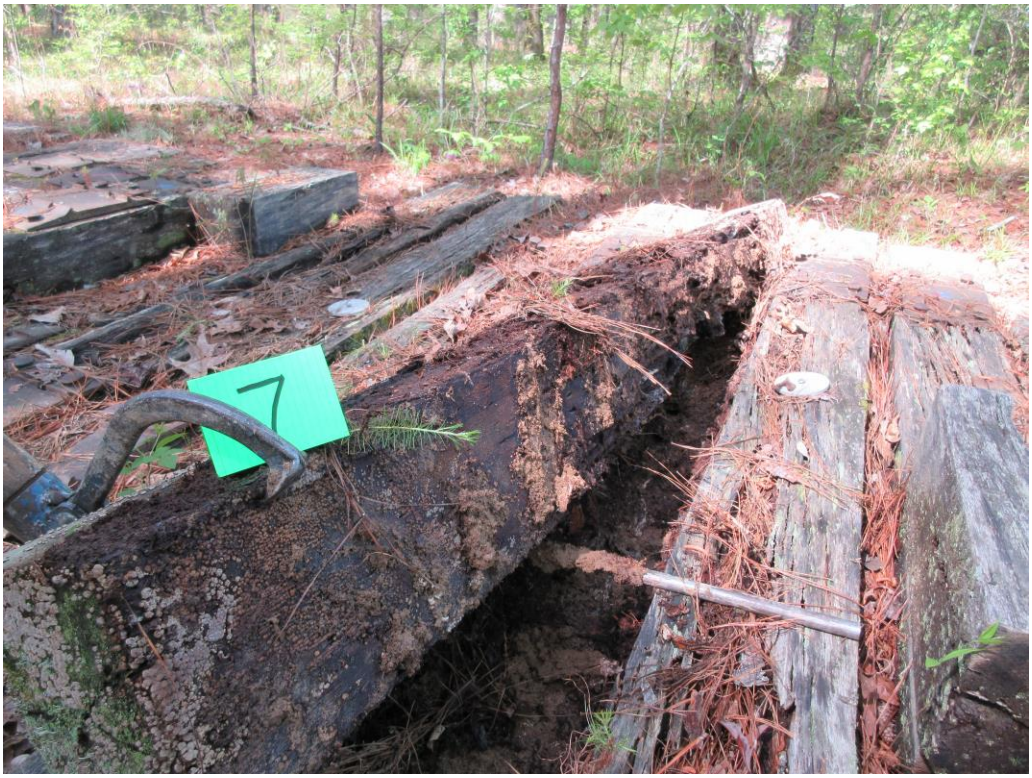
General Observations: No unexpected results were found but biological deterioration in the controls indicates the testing is valid. As in the past checks and/or splits were noted to be worse at Site 2 probably due to more direct sunlight exposure. Termite activity had noticeably increased at this site (all live termites found were Coptotermes *formosanus as noted in previous reports*). Ties at Site 1 were more moist/wet due to the significant rain fall, shade and leaf litter as well as the clay soil at this site and these ties showed an increased amount of decay in the controls and more wide spread termite activity (*Reticulitermes flavipes)*due to these conditions. A few photographs documenting the condition of the sites can be seen below (Figures 1 - 2). The tie number denotes the position of exposure as recorded on the plot-maps. Copies of the inspection forms and photo documentation of the segmented ties can be found in the appendix.

Figure 1 - An overall view of exposure Site 1 illustrating the conditions at the time of inspection.

Figure 2 - A general photograph of Site 2 at the time of inspection.

APPENDIX:

Site 1 – Dorman Lake Research Site



A1 - Tie #7 (Cedarcide/white oak) with heavy decay.

A2 - Tie #7 (Cedarcide/white oak) with decay.

A3 – Tie #16 (Cedarcide/red oak) with extensive decay.

A4 – Tie #16 (Cedarcide/red oak) with decay.

A5 – Tie #25 (Turada) with decay on bottom and side.

A6 – Tie #25 (Turada).

A7 – Tie #36 (Boatright/red oak/borate/creosote 7pcf).

A8 – Tie #36 (Boatright/red oak/borate/creosote 7pcf).

A9 - Tie #58 (Boatright/white oak/borate/creosote to refusal).

A10 - Tie #58 (Boatright/white oak/borate/creosote to refusal).

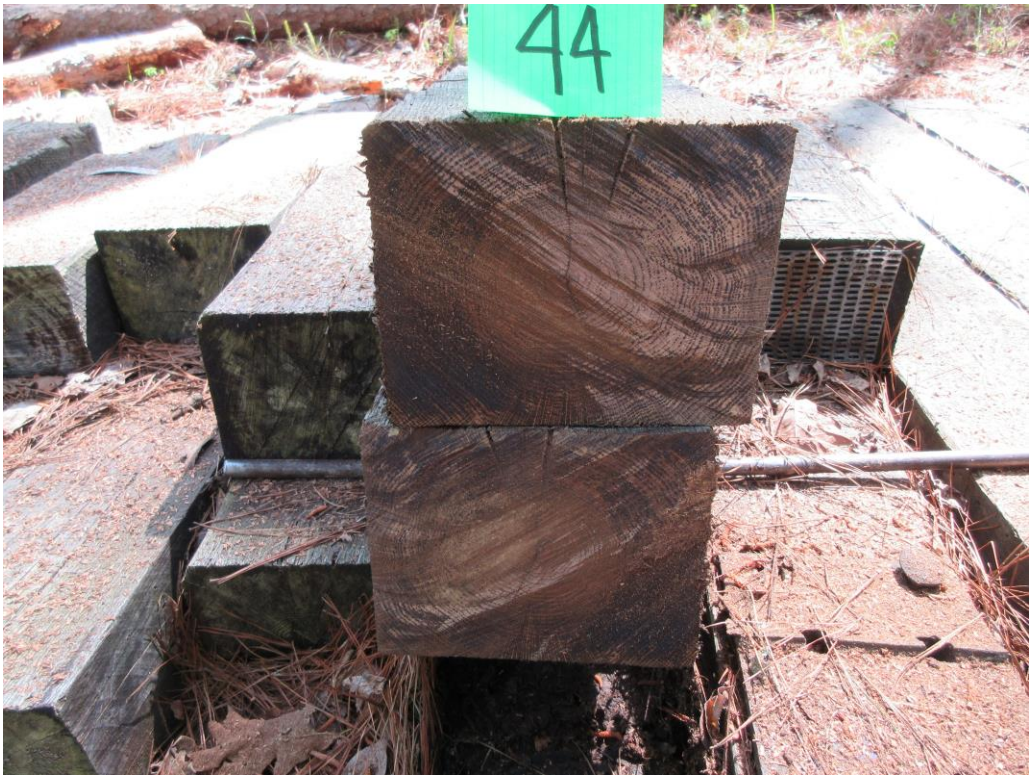
A11 - Tie #77 (Boatright/red oak/creosote 5pcf).

A12 - Tie #77 (Boatright/red oak/creosote 5pcf).

A13 - Tie #79 (Boatright/red oak/borate/creosote 5pcf).

A14 - Tie #79 (Boatright/red oak/borate/creosote 5pcf).

A15 - Tie #44 (Boatright/white oak/creosote to refusal).



A16 - Tie #44 (Boatright/white oak/creosote to refusal).

A17 - Tie #94 (Lonza/white oak) decay on bottom.

A18 - Tie #94 (Lonza/white oak).

A19 - Tie #100 (Lonza/red oak) with moderate decay on bottom.

A20 – Tie #100 (Lonza/red oak) significant internal deterioration.

A21 – Tie #108 (Lonza/white oak) with light decay.

A22 - Tie #108 (Lonza/white oak).

A23 - Tie #121 (Lonza/red oak) with light decay.

A24 - Tie #121 (Lonza/red oak).

A25 - Tie #129 (KMG/red oak).

A26 - Tie #129 (KMG/red oak).

A27 - Tie #140 (KMG/white oak) with trace decay and termite damage.

A28 - Tie #140 (KMG/white oak).

A29 - Tie #318 (untreated/red oak) completely deteriorated.

A30 - Tie #318 (untreated/red oak - closer view of failed tie/decay).

A31 - Tie #153 (Nisus/white oak/borate/oil B).

A 32 - Tie #153 (Nisus/white oak/borate/oil B).

A33 - Tie #159 (Nisus/white oak/borate/oil A).

A34 - Tie #159 (Nisus/white oak/borate/oil A).

A35 Tie #178 (Nisus/red oak/borate/oil B).

A36 - Tie #178 (Nisus/red oak/borate/oil B).

A37 - Tie #191 (Nisus/red oak/borate/oil A).

A38 - Tie # 190 (Nisus/red oak/borate/oil A).

A39 - Tie #202 (Nisus/red oak/borate) decay & trace termite attack on bottom.

A40 - Tie #202 (Nisus/red oak/borate).

A41 - Tie #206 (Nisus/white oak/borate) with decay on bottom.

A42 - Tie #206 (Nisus/white oak/borate) with decay near checks & on bottom.

A43 - Tie #217 (Merichem/red oak/borate/CuNap).

A44 - Tie #217 (Merichem/red oak/borate/CuNap).

A45 - Tie #321 (untreated/white oak) with extensive decay and moderate termite damage.

A46 - Tie #321 (untreated/white oak) which failed due to decay.

A47 - Tie #230 (Merichem/red oak/CuNap).

A48 - Tie #230 (Merichem/red oak/CuNap) with light internal decay.

A49 - Tie #239 (Merichem/white oak/borate/CuNap).

A50 - Tie #239 (Merichem/white oak/borate/CuNap).

A51 - Tie #251 (Koppers/white oak/creosote petroleum solution).

A52 - Tie #251 (Koppers/white oak/creosote petroleum solution).

A53 - Tie #267 (Koppers/red oak/creosote petroleum solution).

A54 - Tie #267 (Koppers/red oak/creosote petroleum solution).

A55 - Tie #275 (Koppers/white oak/P2 creosote).

A56 - Tie #275 (Koppers/white oak/P2 creosote).

A57 - Tie #280 (Koppers/red oak/P2 creosote).

A58 - Tie #280 (Koppers/red oak/P2 creosote).

A59 Tie #334 (Merichem/white oak/CuNap).

A60. Tie #334 (Merichem/white oak/CuNap).

A61 - Tie #288 (Envirosafe/red oak) with moderate decay on bottom.

A62 - Tie #288 (Envirosafe/red oak) with decay on bottom & side faces.

A63 - Tie #324 (Envirosafe/white oak) with decay on bottom.

A64 - Tie #324 (Envirosafe/white oak).

Site 2 – Formosan Termite Research Facility

A65 - Tie #3 (Turada) with decay.

A66 - Tie #3 (Turada).

A67 – Tie #14 (Envirosafe/red oak) with decay.

A68 – Tie #14 (Envirosafe/red oak) with decay.

A69 – Tie #25 (Envirosafe/white oak) with decay and live termites.

A70 – Tie #25 (Envirosafe/white oak) with extensive decay.

A71 – Tie #35 (Boatright/red oak/creosote 5pcf).

A72 – Tie #35 (Boatright/red oak/creosote 5pcf) internal decay.

A73 - Tie #45 (Boatright/red oak/borate-creosote 5pcf).

A74 - Tie #45 (Boatright/red oak/borate-creosote 5pcf).

A75 - Tie #54 (Boatright/white oak//creosote to refusal).

A76 - Tie #54 (Boatright/white oak//creosote to refusal) with internal decay.

A77 - Tie #64 (Boatright/white oak/borate-creosote to refusal).

A78 - Tie #64 (Boatright/white oak/borate-creosote to refusal) with trace internal decay.

A79 - Tie #74 (Boatright/red oak/borate-creosote 7pcf).

A80 - Tie #74 (Boatright/red oak/borate-creosote 7pcf).

A81 - Tie #88 (Lonza/red oak) decay and termite damage on bottom.

A82 - Tie #88 (Lonza/red oak) heavy decay evident in cross-section.

A83 - Tie #98 (Nisus/red oak/borate/oil A).

A84 – Tie #97 (Nisus/red oak/borate/oil A).

A85 – Tie #108 (Nisus/red oak/borate/oil B).

A86 - Tie #108 (Nisus/red oak/borate/oil B) with pretreatment internal damage.

A87 - Tie #117 (Nisus/white oak/borate/oil B).

A88 - Tie #117 (Nisus/white oak/borate/oil B).

A89 – Tie #131 (Nisus/red oak/borate) with decay on top & bottom.

A90 - Tie #131 (Nisus/red oak/borate) with decay.

A91 - Tie #142 (Nisus/white oak/borate/oil A).

A92 - Tie #142 (Nisus/white oak/borate/oil A).

A93 - Tie #147 (Lonza/white oak) with decay and active Formosan termites.

A94 - Tie #147 (Lonza/white oak) which failed due to decay.

A95 - Tie #83 (untreated/White oak) with heavy decay.

A96 - Tie #290 (untreated/white oak) with decay.

A97 - Tie #252 (untreated/red oak) failed due to decay

A98 - Tie #252 (untreated/red oak).

A99 - Tie #182 (Lonza/white oak) with decay evident.

A100 - Tie #182 (Lonza/red oak).

A101 - Tie #162 (Nisus/white oak/boron) failed due to decay.

A102 - Tie #162 (Nisus/white oak/boron).

A103 – Tie #172 (Lonza/red oak) with decay and termite damage.

A104 - Tie #176 (Lonza/red oak) with decay.

A105 - Tie #201 (Cedarcide/white oak) decay & termite damage.

A106 - Tie #201 (Cedarcide/white oak) with internal decay.

A107 - Tie #206 (Cedarcide/red oak) with extensive decay and moderate termite damage.

A108 - Tie #206 (Cedarcide/red oak).

A109 - Tie #215 (Merichem/white oak/borate/CuNap).

A110 - Tie #215 (Merichem/white oak/borate/CuNap).

A111 - Tie #224 (Merichem/red oak/CuNap) with trace decay.

A112 - Tie #224 (Merichem/red oak/CuNap).

A113 - Tie #235 (Merichem/white oak/CuNap) with trace decay & termite damage.

A114 - Tie #235 (Merichem/white oak/CuNap).

A115 - Tie #246 (Merichem/red oak/borate/CuNap) with trace termite damage.

A116 - Tie #246 (Merichem/red oak/borate/CuNap).

A117 - Tie #274 (KMG/white oak).

A118 - Tie #274 (KMG/white oak).

A119 - Tie #280 (KMG/red oak).

A120 - Tie #280 (KMG/red oak).

A121 - Tie #298 (Koppers/white oak/P2).

A122 - Tie #298 (Koppers/white oak/P2).

A123 - Tie #306 (Koppers/red oak/creosote petroleum solution).

A124 - Tie #306 (Koppers/red oak/creosote petroleum solution).

A125 - Tie #312 (Koppers/white oak/creosote petroleum solution) with light decay & Formosan termite damage.

A126 - Tie #312 (Koppers/white oak/creosote petroleum solution) with internal decay.

A127 - Tie #319 (Koppers/red oak/P2 creosote).

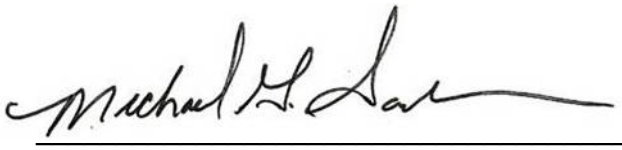
A128 - Tie #319 (Koppers/red oak/P2 creosote).

Report Authorized By:

Date: 8/22/22

C. E. Stokes, PhD
Associate Professor
Department of Sustainable Bioproducts
Phone: 662-325-5811
Fax: 662-325-8126
Email: ces8@msstate.edu

Report Prepared By:



Date: 8/22/22

Michael G. Sanders
Senior Research Associate
Department of Sustainable Bioproducts
Wood Protection Testing Laboratory
Phone: 662-325-8097
Fax: 662-325-8126
E-mail: mgs3@msstate.edu

Applicable Standards:
None: