

2014 Railroad Ties Survey

for

Railway Tie Association (RTA)

Association of American Railroads (AAR)

and

American Short Line and Regional Railroad Association (ASLRRRA)

by

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Introduction

Information regarding the types of railroad ties being put into service and the methods of disposition of ties following use is important to the railroad and wood preserving industries and the government bodies for various reasons. In response to questions posed by the U. S. Environmental Protection Agency (EPA), the Railway Tie Association (RTA) conducted a survey and provided results to the EPA about tie disposition in 2008.

Since that time, the EPA has passed regulations that may limit use of used ties as fuel in the Non-Hazardous Secondary Materials Rule. As currently written, the proposed regulations will allow use of creosote treated railroad ties as fuel provided that they “are processed and combusted in units designed to burn both biomass and fuel oil.”¹ With the rule still not final, the industry may avoid any restrictions but it may also need to provide additional data. An additional EPA June 2, 2014 proposal, the Clean Power Plan, to cut anthropogenic carbon dioxide emissions may also impact demand for ties as a renewable fuel. Finally, EPA is mandated to continue reviewing all wood preservatives in their ongoing process required under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which could have future impacts on railroads. Thus, the railroad and wood preserving industries need to have valid, current data about railroad tie use, reuse, recycling and disposal to be able to react as needed.

Background

In mid-2014, the RTA began working with Stephen Smith, P.E. to conduct a new survey of railroads practices regarding ties. In order to obtain a broader consensus set of data, the RTA obtained agreement from the Association of American Railroads (AAR) and American Short Line and Regional Railroad Association (ASLRRA) to cooperate on the study. A questionnaire was developed for completion by the railroads and their tie disposition contractors. A copy is included in Appendix A. Copies of the questionnaire were distributed to member railroads in the U.S. and Canada by email in September, 2014. Follow-up emails were sent through March, 2015.

The survey questionnaire was designed in two parts. The first part was intended to be completed by railroad companies. This asked for the 2013 annual number of ties purchased and the percentages of ties of typical types; creosote, creosote/borate, copper naphthenate, copper naphthenate/borate, water-borne, concrete, steel, or plastic composite. It also asked for the number of ties removed in 2013. If these were handled by contractors, the names of contractors were requested and the railroad was asked to forward the questionnaire to these contractors to be completed. If these were handled by the railroad, the percentage of ties was requested to each fate; reuse by same or another railroad, reuse for commercial or residential landscaping, reuse for farms or agriculture, recycle for energy by combustion or gasification, disposal by incineration or landfill, or other. The second part was intended to be completed by contractors that handle disposition of ties for a railroad and included the same options as above for fates.

The response rate was good from the Class 1 railroads, but only minimal response was received from the Short Line railroads. Data collected from the questionnaire responses through March 2015 are summarized in this report.

¹ EPA proposed rule amendments ID: EPA-HQ-RCRA-2013-0110-0001, March 25, 2014.. Website: <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-RCRA-2013-0110-0001>.

Ties Survey Results

A total of 13 completed survey forms were received. Seven responses were from railroads and six were from contractors related to their tie disposition work for railroads. Five of seven Class 1 railroads responded, covering both U.S. and Canadian operations. Only two other railroad-operating entities responded. Total tie purchases reported for 2013 were approximately 15 million ties. This volume compares well to the 17 million ties reported for Class 1 U.S. railroads and 24 million for all U.S. railroad mileage². Thus, the results cover approximately 60% to 70% of the North American railroad activity. By another measure, the responding Class 1 railroads represented approximately 80% of North American (Canada and U.S.) track mileage³. Thus, results are likely good evidence for average or typical tie purchase and disposition choices being made by North American railroads.

Types of Ties Being Purchased

A total of 14,916,638 ties were reported purchased in 2013 by survey respondents. The percentages and numbers of each type of tie purchased are summarized in Table 1.

| Percentage and Number of Each Type | | | | | | | |
|------------------------------------|-----------------|-------------|--------------|-------------|-----------|---------|---------|
| Creosote | Creosote-borate | Copper naph | CuNap-Borate | Water borne | Concrete | Steel | Plastic |
| 51.4% | 38.0% | 0.0% | 1.7% | 0.0% | 7.9% | 0.9% | 0.2% |
| 7,672,632 | 5,666,389 | 0 | 249,612 | 0 | 1,175,591 | 128,030 | 24,384 |

Table 1 - Tie Purchases

In addition to the types of ties purchased, railroads were asked if potential for using the ties as fuel at the end of the use life was an important consideration regarding the purchase choice. Five of the seven railroads, representing 71% of responding purchasers, responded “yes.”⁴

² Norrell, Fred. 2014. Strong Demand Still Raises Questions. Crossties Sep/Oct 2014, page 8.

³ AAR, 2015. Association of American Railroads website at <http://freightrailworks.org/network/>.

⁴ In an August 2015 follow-up, all 7 Class 1 Railroads, plus an additional large short line holding company, responded yes to the following question: "Is the potential for using a specific type of treated wood tie as fuel at the end of its useful life an important consideration regarding today's purchase choice?" This updates and reaffirms the conclusion that the ability to recycle ties for energy production in the future is a key factor in today's RR purchasing decisions as it relates to treated wood crosstie type.

Used Tie Disposition

Results covered the disposition of 12,236,059 ties in 2013. The percentages and numbers for each type of disposition are summarized in Table 2.

| Percentage of Each Disposition Method | | | | | | | | | |
|---------------------------------------|-------------------|----------------------------|-------------------|-----------------------------|-------|--------------|--------------------|----------------|-----------|
| Reuse by same RR | Reuse by other RR | Reuse commercial landscape | Reuse agriculture | Reuse residential landscape | Other | Incineration | Recycle combustion | Recycle gasify | Land-fill |
| 0.8% | 0.1% | 11.5% | 0.4% | 5.6% | 0.0% | 0.0% | 81.3% | 0.0% | 0.3% |
| 95,205 | 12,573 | 1,406,322 | 50,292 | 689,190 | 0 | 0 | 9,949,049 | 0 | 33,429 |

Table 2 - Ties Disposition

Information regarding the cost of recycling ties for energy or disposing in landfills was also requested. The costs for disposition as energy to combustion facilities, such as cogeneration or heating boilers, were reported to be quite variable. Three contractors reported paying tipping fees of \$15 to \$25 per ton (roughly \$1 to \$2 per tie) while one reported being paid approximately \$25 per ton. Those paying tipping fees represented approximately 35% of total tie dispositions while the one selling tie fuel represented approximately 15% of the total tie dispositions. Only approximately 0.3% or 33,000 ties were reported to be disposed in landfills. Landfill disposal tipping fees ranged from \$22 to \$60 per ton (roughly \$2 to \$4 per tie).

Comparison to 2008 Survey

As noted above, the RTA completed a survey of tie disposition in 2008. Results of that survey are shown in Table 3.

| RTA 2008 Wood Crossties Survey | |
|--|--------|
| Reused as cascaded ties for railroad application – | 4.7% |
| Reused for commercial landscaping – | 14.4% |
| Reused for commercial farms (fence posts, etc.) – | 5.2% |
| Reused for residential landscaping – | 14.4% |
| Disposed of in approved/permitted landfills – | 5.1% |
| Disposed of by approved/permitted cogeneration – | 53.8% |
| Disposed of by approved/permitted gasification – | 2.5% |
| Total – | 100.0% |

Table 3 - 2008 Survey Results

While the current results are generally similar to those from 2008, there are some differences that may be important. Table 4 summarizes disposition methods and highlights the differences. The results indicate significant changes in practices. Reuse by railroads, landscape reuse, and landfill disposal decreased dramatically while reuse as fuel increased substantially compared to 2008 levels.

| Comparative Results | RR Reuse | Landscape Type Uses | Fuel Uses | Landfill |
|---------------------|----------|---------------------|-----------|----------|
| 2013 survey | 0.9% | 18% | 81.3% | 0.3% |
| 2008 survey | 4.7% | 34% | 56.3% | 5.1% |

Table 4 - Survey Results Comparisons

It is possible that the changes in disposition results from 2008 to 2013 actually reflect changes in industry practice, it is also possible that the changes at least partially reflect the different railroads that responded. The 2008 survey also mainly reflected Class 1 Railroads. Changes from 2008 to 2013 indicated by the surveys are probably indicative of changes in practice by railroads in general, but most certainly of the Class 1 Railroads specifically.

Short Line and Regional Railroads

On the other hand, since Short Line and Regional railroads account for approximately 25-29% of tie purchases, but only represent approximately 1% of the current survey volume, any changes in practices that differ from those of Class 1 railroads would not be reflected in the results. It is possible that the typical practices of the Short Line railroads may not always closely follow those of the Class 1 railroads. However, large Regional roads and holding companies are known to follow practices similar to Class 1 railroads for engineering, purchasing and maintenance activities. Given the smaller more localized nature of Short Lines it is possible that they may they may dispose of more ties in landfills. For Regional roads more options for cogeneration are likely available and utilized wherever possible. While the results are applicable to the railroad industry overall, for these reasons individual railroads, especially smaller and more localized ones, may differ significantly from these generalized industry practices.

Summary

Current practice for new tie purchases remains largely as it has been for decades with most (51%) ties being preserved by creosote treatment. Added to this is an increasing trend, currently at 38% of purchases, to dual treat with borate and creosote. Dual treated ties with borate and copper naphthenate, a relatively new preservative system for the railroad market, now have a small share of nearly 2% of purchases. Concrete ties, at about 8% and steel ties at about 1%, have been present in the tie market for at least a couple decades and seem to retain their market share by fitting particular market niches.

The most popular fate for removed used ties is recycling for energy via combustion at approximately 81% of all removed ties. It is common for railroads to pay a tipping fee for this method, although under the right market conditions, they may also be paid for the ties as fuel. Recycling ties to other uses appropriate for preserved wood, such as use in landscaping or agricultural functions, is common with approximately 18% of ties removed. Disposing used ties in landfills remains uncommon at only 0.3% of ties and is costly at an average cost of approximately \$36 per ton or nearly \$3 per tie. Landfill disposal may be more common among the smaller railroads, where disposition options are more limited.

The results of this current study in comparison to the results of the 2008 crosstie study indicate that the Class 1 railroads have been transitioning to less recycling of ties for landscape type uses and more to recycling for energy recovery. This trend is likely also occurring with other railroads as well, but due to the low participation by Short Line and Regional railroads, this survey is not conclusive regarding practices of non-Class 1 railroads.

APPENDIX 1
SURVEY QUESTIONNAIRE

RTA, AAR, and ASLRRA 2014 Railroad Ties Survey

Background

Accurate data about the treatments and disposition of railroad crossties is important for the railroad and wood preserving industries. Data provides a basis for legislative and regulatory advocacy by industry organizations, railroad companies, treaters, and suppliers. The Railway Tie Association last developed data in 2008, six years ago. In recent years, alternative products and new or modified preservative systems have become more common, and reuse of ties for energy has become more important, but also problematic as regulations have been in flux.

Now, the Railway Tie Association (RTA), Association of American Railroads (AAR) and American Short Line and Regional Railroad Association (ASLRRA) are in partnership requesting the time and support of railroads and their contractors to complete this questionnaire so that we can continue to offer the most accurate industry information possible and to best represent your interests in the regulatory, legislative, alternative wood preservative development and public response arenas.

Confidentiality

Individual responses and company specific information will remain confidential and not be publicly shared. Only the summarized data will be made public. Names and companies are requested only for the purpose of knowing who has and has not responded and to allow limited follow-up for clarification, as needed.

Instructions

The questionnaire is in two pages. The first page, Railroad Survey Page, is to be completed for each railroad company. The second page, Railroad Contractor Survey Page, is only applicable to companies that contract to railroads to remove and dispose of used ties. In each form, descriptions of information and questions are in the shaded cells. Information or answers are to be entered into the white, unshaded cells only. Information is requested for the full calendar year of 2013 or for your most recent full fiscal year.

In cases where railroads outsource tie disposition to contractors and, thus, do not know the final disposition of ties, we request that you list those contractors on the first page and forward the last page of this questionnaire to each of those listed contractors with your request that they complete the survey and return the completed form either directly as below or to you so you can include those with your response. Contractors, if you work for more than one railroad, please complete one form for each.

Please email completed survey forms to our consultant, Stephen Smith, who will compile all of the data into statistical data tables for which individual personal and company information will not be included. Confidential information will only be used as a means of determining survey response rates and, if needed, for Mr. Smith to obtain clarification regarding the responses. Forms may be completed in the electronic Word format or be printed, completed by hand, and scanned to PDF or JPG formats.

Email responses to: ssmith@rta.org by October 24, 2014.

Railroad Survey Page

| Confidential Railroad Identification | |
|--------------------------------------|---------------------------|
| Railroad Name: | |
| Survey completed by: | Name: Email: Phone: |

2013 Tie Purchases

| | | |
|--|---|-------------------|
| Number of ties purchased in 2013: | | ties |
| Of the above total number of ties, enter below the fraction of each type purchased (total equals 100%) | | |
| Creosote | % | Water-borne |
| Creosote/borate | % | Concrete |
| Copper naphthenate | % | Steel |
| Copper naphthenate/borate | % | Plastic composite |
| Is potential for disposal as fuel an important consideration in tie purchases? Circle one: | | Yes or No |
| Discuss reasons: | | |

2013 Tie Removals

| | | |
|--|--------------|---|
| Number of ties removed from track in 2013: | | ties |
| Disposition by contractor to RR: | | % |
| List names of primary tie disposal contractors used by your railroad that you have requested to complete this survey | | |
| Contractor 1: | | |
| Contractor 2: | | |
| Contractor 3: | | |
| Contractor 4: | | |
| Disposition by railroad: (total of disposition by contractor + by railroad = 100%) | | % |
| Of all ties disposed by railroad, what fraction went to each fate (total equals 100%)? | | |
| Reuse by same railroad (cascade) | % | Reuse for farms, agriculture |
| Reuse by another railroad | % | Reuse for residential landscaping |
| Reuse for commercial landscaping | % | Other (state) |
| Recycle for energy in combustion boiler or cogeneration | % | Incineration (not for energy) disposal |
| Recycle for energy via gasification or pyrolysis process | % | Disposal in landfills |
| The sum of the above 10 percentage values should equal 100% | | |
| Typical tipping fee to RR for recycle to energy (either of above) | \$ _____ ton | Typical tipping fee to RR for landfill disposal |
| | | \$ _____ ton |

Railroad Contractors Survey Page

| Confidential Contractor Information (complete one form for each railroad for which you work) | |
|--|---------------------------|
| Contractor Name: | |
| Survey completed by: | Name: Email: Phone: |
| Name of railroad contracting for ties: | |
| Number of ties handled for railroad: | ties |

2013 Contractor Tie Disposition

| Of all ties disposed by contractor for above listed railroad, what fraction went to each fate (total equals 100%)? | | | |
|---|-------------|---|-------------|
| Reuse by same railroad (cascade) | % | Reuse for farms, agriculture | % |
| Reuse by another railroad | % | Reuse for residential landscaping | % |
| Reuse for commercial landscaping | % | Other (state) | % |
| Recycle for energy in combustion boiler or cogeneration | % | Incineration (not for energy) disposal | % |
| Recycle for energy via gasification or pyrolysis process | % | Disposal in landfills | % |
| The sum of the above 10 percentage values should equal 100% | | | |
| Typical tipping fee to RR for recycle to energy (either of above) | \$_____ ton | Typical tipping fee to RR for landfill disposal | \$_____ ton |