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FOREST AND WILDLIFE RESEARCH CENTER

DEPARTMENT OF SUSTAINABLE BIOPRODUCTS

Ninth Annual Evaluation of Phase II MSU/RTA Alternative Preservative Study

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This report covers the ninth annual evaluation of the full-length cross ties exposed as part of the MSU/RTA Phase II alternative preservative study. A visual evaluation of the exposed top surface was conducted for all ties at both exposure sites.

General Observations:

As noted in previous reports, Site 2 ties appeared to be a drier probably due to more direct sunlight exposure allowing for more checking. However, an increase in Formosan termite activity was noted again this year.

Ties at Site 1 were more moist/wet due to the increased shade and leaf litter at this site and thus more signs of decay were noted at this site.

General photographs documenting the condition of the sites can be seen below (Figures 1-7). The tie number denotes the position of exposure as recorded on the plot-maps and inspection forms. Copies of the inspection forms are included in the appendix.

Site 1 – Dorman Lake Research



Figure 1 - Site 1 (MSU Dorman Lake Test Site) at the time of inspection.



Figure 2 - Tie 25 showing signs of severe deterioration



Figure 3 - Tie 70 showing no signs of decay or termite damage.



Figure 4 - Tie 70 with decay and light termite damage.



Figure 5 - Tie 109 with decay.

Site 2 – Formosan Termite Research Facility



Figure 6- Site 2 (MSU Formosan Termite Research Facility) at the time of inspection.



Figure 7 – Tie 37 which failed from decay and also had termite damage.



Figure 8 - Tie 110 with decay and light Formosan termite damage.



Figure 7 – Tie 154 with large check holding moisture.

APPENDIX:

Plot Map RTA Phase II Ties (Dorman Lake Site 1)
 Position Row 1 runs West -East (Northern most row)

			April-21		Decay	Termite	Decay	Termite	Comments
Koppers	1	T6	WO-Bor-6#	x	x	x	x	cut 2016	
	2	T6		x	x	x	x	cut 2019	
	3	T6		10	10			CK	
	4	T6		10	10				
	5	T6		10	10				
	6	T6		10	10			CK	
	7	T6		10	10				
	8	T6		10	10				
	9	T6		10	10				
	10	T6		10	10			CK	
	11	T70	RO-Bor-7#	x	x	x	x	cut 2016	
	12	T70		x	x	x	x	cut 2019	
	13	T70		10	10				
	14	T70		10	10				
	15	T70		10	10			loose plate/ck	
	16	T70		10	10				
	17	T70		10	10				
	18	T70		10	10				
	19	T70		10	10			CK	
	20	T70		10	10			CK/LP	
	21	blank tag	Unt. RO	x	x	x	x	cut 2016	
	22	blank tag		x	x	x	x	cut 2019	
	23	blank tag		6	9			CK	
	24	blank tag		4	8				
	25	blank tag		4	8				
	26	blank tag		6	9.5				
	27	blank tag		6	10				
	28	blank tag		6	10			LP	
	29	blank tag		4	10			LP	
	30	blank tag		4	10			CK/LP	
	31	T10	RO-Creo-7#	x	x	x	x	cut 2016	
	32	T10		x	x	x	x	cut 2019	
	33	T10		10	10				
	34	T10		10	10			CK	
	35	T10		10	10			CK	
	36	T10		10	10			CK	
	37	T10		10	10				
	38	T10		10	10				
	39	T10		10	10			split	
	40	T10		10	10			CK	
	41	T7	WO-Bor-7#	x	x	x	x	cut 2016	
	42	T7		x	x	x	x	cut 2019	
	43	T7		10	10			CK	
	44	T7		10	10			CK	
	45	T7		10	10			CK	
	46	T7		10	10			CK	
	47	T7		10	10			CK	
	48	T7		10	10				
	49	T7		10	10				
	50	T7		10	10			CK	
	51	T60	RO-Bor-6#	x	x	x	x	cut 2016	
	52	T60		x	x	x	x	cut 2019	
	53	T60		10	10				

	54	T60		10	10			LP
	55	T60		10	10			
	56	T60		10	10			
	57	T60		10	10			LP
	58	T60		10	10			
	59	T60		10	10			
	60	T60		10	10			
Stella-Jones	61	RO-1 step	x		x	x	x	cut 2016
	62	RO-1 step	x		x	x	x	cut 2019
	63	RO-1 step		10	10			CK
	64	RO-1 step		10	10			
	65	RO-1 step		10	10			
	66	RO-1 step		10	10			
	67	RO-1 step		10	10			
	68	RO-1 step		10	10			
	69	RO-1 step		10	10			
	70	RO-1 step		10	10			
	71	WO-Creo	x		x	x	x	cut 2016
	72	WO-Creo	x		x	x	x	cut 2019
	73	WO-Creo		10	10			
	74	WO-Creo		10	10			
	75	WO-Creo		10	10			
	76	WO-Creo		10	10			
	77	WO-Creo		10	10			
	78	WO-Creo		10	10			CK
	79	WO-Creo		10	10			
	80	WO-Creo		10	10			CK
	81	WO-1 step	x		x	x	x	cut 2016
	82	WO-1 step	x		x	x	x	cut 2019
	83	WO-1 step		10	10			CK
	84	WO-1 step		10	10			
	85	WO-1 step		10	10			
	86	WO-1 step		10	10			CK
	87	WO-1 step		10	10			
	88	WO-1 step		10	10			
	89	WO-1 step		10	10			
	90	WO-1 step		10	10			
	91	WO-Unt	x		x	x	x	cut 2016
	92	WO-Unt	x		x	x	x	cut 2019
	93	WO-Unt		8	10			
	94	WO-Unt		7	10			CK
	95	WO-Unt		8	10			
	96	WO-Unt		7	10			
	97	WO-Unt		7	9			
	98	WO-Unt		8	10			CK
	99	WO-Unt		8	10			FB
	100	WO-Unt		8	10			FB
Lonza	101	784	DF-Unt.	x		x	x	cut 2016
	102	783		x		x	x	cut 2019
	103	782		6	9			
	104	781		7	9.5			FB/CK
	105	789		9	9			
	106	788		7	9			
	107	787		9	9			LP
	108	786		8	9			FB/LP
	109	785		7	9			
	110	790		8	9			LP

111	684	DF-DOT-ACZA	x	x	x	x	cut 2016
112	683		x	x	x	x	cut 2019
113	682		10	10			
114	681		10	10			
115	689		10	10			CK
116	688		10	10			
117	687		10	10			
118	686		10	10			
119	685		10	10			CK
120	690		10	10			
121	581	RO-DOT-ACZA-Oil	x	x	x	x	cut 2016
122	586		x	x	x	x	cut 2019
123	587		10	10			CK
124	584		10	10			
125	583		10	10			CK
126	582		10	10			CK/LP
127	585		10	10			CK
128	590		10	10			CK
129	589		10	10			CK
130	588		10	10			CK
131	735	RO-ACZA-Oil	x	x	x	x	cut 2016
132	734		x	x	x	x	cut 2019
133	732		10	10			CK
134	733		10	10			CK
135	731		10	10			CK
136	775	WO-ACZA-Oil	x	x	x	x	cut 2016
137	774		x	x	x	x	cut 2019
138	773		10	10			
139	772		10	10			
140	771		10	10			
141	524	WO-DOT-ACZA-Oil	x	x	x	x	cut 2016
142	523		10	10			
143	522		10	10			loose plate/CK
144	521		10	10			loose plate/CK
145	529		10	10			
146	528		10	10			
147	527		10	10			CK
148	526		10	10			
149	530		10	10			
150	525		10	10			CK
151	641	RO-DOT-ACZA-Oil	x	x	x	x	cut 2016
152	646		x	x	x	x	cut 2019
153	642		10	10			
154	643		10	10			CK
155	644		10	10			CK
156	645		10	10			CK
157	647		10	10			CK/LP
158	648		10	10			CK
159	649		10	10			CK
160	650		10	10			CK
161	702	RO-ACZA	x	x	x	x	cut 2016
162	703		x	x	x	x	cut 2019
163	704		10	10			
164	705		10	10			
165	709		10	10			CK
166	708		10	10			
167	707		10	10			CK

168	706			10	10			
169	710			10	10			CK
170	701			10	10			
171	747	WO-ACZA	x		x	x	x	cut 2016
172	746		x		x	x	x	cut 2019
173	742			9.5	10			
174	741			10	10			CK
175	744			10	10			
176	749			10	10			
177	748			10	10			CK/LP
178	743			10	10			
179	745			10	10			
180	750			10	10			
181	803	DF-P2	x		x	x	x	cut 2016
182	802		x		x	x	x	cut 2019
183	806			10	10			CK
184	808			10	10			
185	807			10	10			CK
186	805			10	10			CK
187	804			10	10			CK
188	810			10	10			
189	809			10	10			
190	801			10	10			CK
191	544	WO-ACZA-ET	x		x	x	x	cut 2016
192	543		x		x	x	x	cut 2019
193	542			10	10			CK
194	541			10	10			
195	549			10	10			
196	548			10	10			CK
197	547			10	10			CK
198	546			10	10			CK
199	545			10	10			CK
200	550			10	10			CK
201	664	DF-ACZA-DOT-ET	x		x	x	x	cut 2016
202	663		x		x	x	x	cut 2019
203	662			10	10			CK
204	661			10	10			CK
205	669			10	10			CK
206	668			10	10			CK
207	667			10	10			
208	666			10	10			
209	665			10	10			CK
210	670			10	10			
211	627	RO-ACZA-ET	x		x	x	x	cut 2016
212	628		x		x	x	x	cut 2019
213	629			10	10			CK
214	630			10	10			
215	622			10	10			CK
216	623			10	10			CK
217	624			10	10			CK
218	625			10	10			CK
219	626			10	10			
220	621			10	10			split
221	502	WO-ACZA-DOT	x		x	x	x	cut 2016
222	503		x		x	x	x	cut 2019
223	504			10	10			CK/LP
224	505			10	10			CK

225	507			10	10				
226	508			10	10				
227	509			10	10			CK	
228	510			10	10			CK	
229	501			10	10			CK	
230	506			10	10			CK/LP	
231	564	WO-DOT-ACZA-ET	x		x	x	x	cut 2016	
232	563		x		x	x	x	cut 2019	
233	562			9.5	10				
234	561			10	10			CK/IS	

Position Row 2 runs West -East (Southern most row)

				April-21					
				Decay	Termite	Decay	Termite	Comments	
235	569			10	10				
236	568			10	10			CK	
237	567			10	10				
238	566			10	10			LP	
239	565			10	10			CK	
240	570			10	10			CK/LP	
241	604	RO-DOT-ACZA-ET	x		x	x	x	cut 2016	
242	603		x		x	x	x	cut 2019	
243	602			10	10			LP	
244	601			10	10			CK	
245	609			10	10			LP	
246	608			10	10			CK/LP	
247	607			10	10				
248	606			10	10			CK	
249	605			10	10				
250	610			10	10			CK/LP	

CK=check
 FB=fruiting body
 LP=loose plate

Plot Map RTA Phase II Ties (McNeill Site 2)
 Position Row 1 runs East - West (Southern most row)

		Mar-21		Decay	Termite	Decay	Termite	Comments
Stella Jones	1	WO-Creo		10	10			check/bowed
	2	WO-Creo	x	x	x	x		cut 2016
	3	WO-Creo	x	x	x	x		cut 2019
	4	WO-Creo		10	10			check
	5	WO-Creo		10	10			check
	6	WO-Creo		10	10			check
	7	WO-Creo		10	10			check
	8	WO-Creo		10	9			check/FST
	9	WO-Creo		10	10			split
	10	WO-Creo		10	10			split
	11	1-Step-RO	x	x	x	x		cut 2016
	12	1-Step-RO	x	x	x	x		cut 2019
	13	1-Step-RO		10	10			split
	14	1-Step-RO		10	10			check
	15	1-Step-RO		10	10			check
	16	1-Step-RO		10	10			check
	17	1-Step-RO		9.5	10			defect top South end/DK top
	18	1-Step-RO		10	10			check/IS
	19	1-Step-RO		10	10			check
	20	1-Step-RO		10	10			check
	21	1-Step-WO	x	x	x	x		cut 2016
	22	1-Step-WO	x	x	x	x		cut 2019
	23	1-Step-WO		10	10			check
	24	1-Step-WO		10	10			check
	25	1-Step-WO		10	10			check
	26	1-Step-WO		10	10			check
	27	1-Step-WO		10	10			check
	28	1-Step-WO		10	10			check
	29	1-Step-WO		10	10			check
	30	1-Step-WO		10	10			check
	31	Unt. - WO	x	x	x	x		cut 2016
	32	Unt. - WO	x	x	x	x		cut 2019
	33	Unt. - WO		8	10			FB
	34	Unt. - WO		6	9.5			DK top S end/retics
	35	Unt. - WO		6	10			check
	36	Unt. - WO		8	10			check
	37	Unt. - WO		0	7			Failed
	38	Unt. - WO		7	7			check
	39	Unt. - WO		7	9.5			DK top S end/FB
	40	Unt. - WO		8	9			FB/beetle dmg/FST
Lonza	41	572	WO-DOT-ACZA-ET	x	x	x	x	cut 2016
	42	573		x	x	x	x	cut 2019
	43	574		10	10			check/LP
	44	575		10	10			check/LP
	45	576		10	10			check/LP
	46	577		10	10			LP
	47	578		10	10			LP
	48	579		10	10			check/LP
	49	580		10	10			check/LP
	50	571		10	10			LP
	51	611	RO-DOT-ACZA-ET	x	x	x	x	cut 2016
	52	612		x	x	x	x	cut 2019
	53	613		9.5	10			check/LP/Edge DK
	54	614		9.5	10			check/LP/Edge DK
	55	615		10	10			check/LP
	56	617		10	10			check/LP
	57	618		10	10			check/LP
	58	619		10	10			LP
	59	620		10	10			check/LP
	60	616		10	10			LP
	61	675	DF-DOT-ACZA-ET	x	x	x	x	cut 2016
	62	674		x	x	x	x	cut 2019
	63	673		10	10			check/LP
	64	672		10	10			split
	65	671		10	10			check/LP
	66	679		10	10			split

67	678		10	10					
68	677		10	10					
69	676		10	10				check/LP	
70	680		10	10				check	
71	555	WO-ACZA-ET	x	x	x	x		cut 2016	
72	554		x	x	x	x		cut 2019	
73	553		10	10					
74	552		10	10				split	
75	551		10	10				LP	
76	560		10	10				LP	
77	559		10	10				check/LP	
78	558		9.5	10				check	
79	557		10	10				LP	
80	556		10	10				LP	
81	640	RO-ACZA-ET	x	x	x	x		cut 2016	
82	639		x	x	x	x		cut 2019	
83	638		10	10				check/LP	
84	637		10	10				LP	
85	636		10	10				LP	
86	635		10	10				check/LP/S-end plate off	
87	634		10	10				check/LP	
88	633		10	10				check/LP	
89	632		10	10				check/LP/S-end plate loose	
90	631		10	10					
91	695	DF-DOT-ACZA	x	x	x	x		cut 2016	
92	694		x	x	x	x		cut 2019	
93	693		10	10				check/end plat corroded/LP	
94	692		10	10				end plate corroded/check	
95	691		10	10				end plate corroded	
96	699		10	10				end plate corroded/check	
97	698		10	10				end plate corroded/check	
98	697		10	10				end plate corroded/check/LP	

99	696		10	10			end plate corroded	
100	700		10	10			end plate corroded	
101	795	DF-Unt.	x	x	x	x	cut 2016	
102	794		x	x	x	x	cut 2019	
103	793			8	10		check/IS/FB	
104	792		0	0	0	0	Failed	
105	791		8	9			check/IS	
106	800		8	10			FB/IS	
107	799		9	10			check/IS	
108	798		9	10			FB/check/IS	
109	797		9	10			check/IS	
110	796		6	9			check/LP	
111	755	WO-ACZA	x	x	x	x	cut 2016	
112	754		x	x	x	x	cut 2019	
113	753		10	10			end plate corroded/LP	
114	752		10	10			end plate corroded/check/LP	
115	751		10	10			end plate corroded	
116	760		10	10			Knot/burl under plate area N end	
117	759		10	10			end plate corroded	
118	758		10	10			check/end plat corroded	
119	757		10	10			check/end plat corroded	
120	756		10	10			end plate corroded	
121	712	RO-ACZA	x	x	x	x	cut 2016	
122	713		x	x	x	x	cut 2019	
123	714		10	10			end plate corroded/check	
124	715		10	10			end plate corroded	
125	717		10	10			end plate corroded/check	
126	718		10	10			end plate corroded/check	
127	719		10	10			end plate corroded/LP	
128	720		10	10			end plate corroded & loose/check/LP	
129	716		10	10			end plate corroded/LP	
130	711		10	10			end plate corroded & loose/check/LP	
131	511	WO-ACZA-DOT	x	x	x	x	cut 2016	
132	512		x	x	x	x	cut 2019	
133	513		10	10			end plate corroded/check	
134	514		10	10			end plate corroded/check/LP	
135	515		10	10			end plate corroded/check	
136	516		10	10			end plate corroded	
137	517		10	10			end plate corroded	
138	518		10	10			end plate corroded	
139	519		10	10			end plate corroded	
140	520		10	10			end plate corroded/check	
Row 2 runs East - West (middle row)								
Lonza	141	595	RO-DOT-ACZA-Oil	x	x	x	x	cut 2016
	142	594		x	x	x	x	cut 2019
	143	593		10	10			check/LP
	144	592		10	10			check/LP
	145	600		10	10			check/LP
	146	599		10	10			check/LP
	147	598		10	10			check
	148	597		10	10			check/LP

149	596		10	10				check/LP
150	591		10	10				check
151	740	RO-ACZA-Oil	x	x	x	x		cut 2016
152	739		x	x	x	x		cut 2019
153	738		10	10				severe check/LP
154	737		10	10				severe check
155	736		10	10				check/LP
156	779	WO-ACZA-Oil	x	x	x	x		cut 2016
157	780		x	x	x	x		cut 2019
158	777		10	10				LP
159	778		10	10				LP
160	776		10	10				
161	655	RO-DOT-ACZA-Oil	x	x	x	x		cut 2016
162	654		x	x	x	x		cut 2019
163	653		10	10				check
164	652		10	10				split/LP
165	660		10	10				check
166	659		10	10				check
167	658		10	10				split/LP
168	657		10	10				split
169	651		10	10				check
170	656		10	10				check
171	531	WO-DOT-ACZA-Oil	x	x	x	x		cut 2016
172	532		x	x	x	x		cut 2019
173	533		10	10				check
174	534		10	10				check/LP
175	536		10	10				
176	537		10	10				check
177	538		10	10				check/LP
178	539		10	10				sever check - holding water/LP
179	540		10	10				
180	535		10	10				sever check - holding water/LP
181	820	DF-P2	x	x	x	x		cut 2016
182	817		x	x	x	x		cut 2019
183	819		10	10				check
184	811		10	10				bleeding/check
185	815		10	10				check
186	816		10	10				
187	814		10	10				bleeding
188	813		10	10				
189	818		10	10				check
190	812		10	10				
Koppers	191	WO-Bor-6#	x	x	x	x		cut 2016
	192	T6	x	x	x	x		cut 2019
	193	T6	10	10				check/LP
	194	T6	10	10				split
	195	T6	10	10				LP
	196	T6	10	10				
	197	T6	10	10				check
	198	T6	10	10				
	199	T6	10	10				check

200	T6		10	10			check/LP
201	T7	WO-Bor-7#	x	x	x	x	cut 2016
202	T7		x	x	x	x	cut 2019
203	T7		10	10			LP
204	T7		10	10			check
205	T7		10	10			check/LP
206	T7		10	10			LP
207	T7		10	10			check
208	T7		10	10			check
209	T7		10	10			
210	T7		10	10			severe check/bad tie
211	T70	RO-Bor-7#	x	x	x	x	cut 2016
212	T70		x	x	x	x	cut 2019
213	T70		10	10			
214	T70		10	10			check
215	T70		10	10			check
216	T70		10	10			bleeding
217	T70		10	10			check
218	T70		10	10			check
219	T70		10	10			
220	T70		10	10			check
221	T60	RO-Bor-6#	x	x	x	x	cut 2016
222	T60		x	x	x	x	cut 2019
223	T60		10	10			check
224	T60		10	10			bleeding
225	T60		10	10			check
226	T60		10	10			check
227	T60		10	10			LP
228	T60		10	10			check
229	T60		10	10			bleeding
230	T60		10	10			bleeding
231	T10	RO-Creo-7#	x	x	x	x	cut 2016
232	T10		x	x	x	x	cut 2019
233	T10		10	10			check
234	T10		10	10			check
235	T10		10	10			check
236	T10		10	10			check
237	T10		10	10			check/LP
238	T10		10	10			check
239	T10		10	10			check
240	T10		10	10			check/LP
241	blank tag	Unt. RO	x	x	x	x	cut 2016
242	blank tag		x	x	x	x	cut 2019
243	blank tag		0	0	0	0	Failed
244	blank tag		0	0	0	0	Failed
245	blank tag		0	0	0	0	Failed
246	blank tag		4	7			FST
247	blank tag		0	0	0	0	Failed
248	blank tag		0	0	0	0	Failed
249	blank tag		0	0	0	0	Failed
250	blank tag		0	0	0	0	Failed

Report Authorized By:



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Applicable Standards:
None: