

INVESTIGATION REPORT

I. GENERAL INFORMATION

Company Name: California Western Railroad (Skunk Train)

Facility Address: 100 E. Laurel Street, Fort Bragg, CA

EPA ID Number: CAD066125758

Facility Type: Private

Regulated Units: Storage in containers and tanks (railcar)

Waste Streams: Waste oil, batteries, paint, used railroad ties

Regulatory Status: Generator

Investigated by: Michael Pixton, Robert Aragon, and Antonia Becker

Date of Investigation: January 27-29, 1999

Type of Inspection: CEI CME O&M Focused Limited
 or Investigation
 Facility Rep.: Mr. Gary Milliman Complaint #02-1298-0083

Type of Business: Private railroad

II. CONSENT

Consent to conduct inspection that involves: taking photographs, reviewing and copying records, questioning personnel and inspecting hazardous waste handling areas.

Consent given by (name and title): Mr. Gary Milliman, President

III. DOCUMENTS REVIEWED (circle all reviewed)

a. Manifests, Bills of Lading, LDR's and Exception Reports:

I reviewed the manifesting history for California Western Railroad (CWR) on the Department of Toxic Substances Control (DTSC) database (Haznet). Haznet showed that from 1/1/97 to 12/31/98 CWR had used 14 manifests, primarily for disposal of solvent waste to Safety-Kleen. Nothing in the Haznet system showed disposal of waste oil or used railroad ties as hazardous waste.

IV. NARRATIVE OF OBSERVATIONS/DISCUSSION WITH OPERATOR

Prior to leaving for the site I conducted a review of literature put out by both the railroad associations and the wood preservative industry on the proper management of used railroad ties (Attachment H). All of the literature agreed that resale of the ties for landscaping was the most beneficial reuse and that landfilling was legal. All of the literature stressed that at no time should the ties be burned in an uncontrolled manner. This literature is easily available on the Internet and is distributed by the various associations. I also reviewed current statutes and draft DTSC policy on the management of used ties (treated wood) to verify their regulatory status (Attachment G). The relevant statute is Health and Safety Code (HSC), section 25143.1.5 (Attachment G) which exempts certain treated wood (removed from electric, gas, or telephone service) from management as hazardous waste if certain conditions are met. Those conditions are that the wood is not regulated by federal acts, the wood is disposed of in a composite-lined landfill (Class II), and the landfill is authorized to accept the treated wood waste. These specific exemptions do not apply to railroad ties as they were specifically excluded in the listing of treated wood types that are covered. In addition, any other form of treatment (burning) or disposal (abandonment) would remove the exemption, if it did apply.

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The draft concept paper, by DTSC, (Attachment G) clearly states on its second page that treated wood is considered a non-RCRA hazardous waste and that variances allowing management similar to that allowed under HSC, section 25143.1.5 were formerly issued. The abandonment and/or burning of treated wood, such as railroad ties, is at no time authorized or even suggested. Based on this review I found that land disposal in a Class II landfill was acceptable (provided proper authorization is obtained), but burning of ties could only be conducted at authorized facilities (hazardous waste treatment facilities). While new regulations were proposed by DTSC, no such regulatory changes have been made up to this time. Thus, all treated wood that does not meet the definition in HSC, section 25143.1.5 would be fully regulated as a hazardous waste in California.

January 27, 1999

Mr. Aragon, Ms. Becker, and I met with Mr. John Lawton, Mendocino Air Quality Management District (MAQMD) and Mr. Trey Strickland, Mendocino County Environmental Health Division (County) in Fort Bragg and then proceeded to the area where Mr. Lawton had previously observed a burn pile. We parked our vehicles off road where Company Ranch Road crosses the railroad tracks. There are private residences in this area along the tracks. We then proceeded in a westerly direction along the railroad tracks looking for piles of burned or unburned ties. As we progressed I noted homes, garbage, and horse droppings along the tracks, all indications that various individuals routinely traverse these railroad tracks.

Approximately 100 meters from where the vehicles were parked we found two piles of railroad ties (Attachment A, photos #1-2), one pile on either side of the tracks. There were 4-5 ties in one pile and 8-10 ties in the other pile. There was no indication of them being burned. As we progressed further west the tracks started to parallel the Noyo River. The river varied 5 meters to 30 meters, in distance, from tracks. The next pile (not stacked) of ties was approximately a quarter mile from our starting position. Nearby were two stacks of ties (13 & 9) and only one of the ties appeared to be partially burned (Attachment A, photos #10-11). At a half mile from the starting position we found a pile of ties that had been burned (Attachment A, photos #3-5). Partially burned ties were on both sides of the tracks along with charred brush. We found three more small burn areas (Attachment A, photo #8) as we continued. One burn area had half burned ties in it and the tree branches 20' above the fire had been burned (Attachment A, photos #6-7).

Near the 8-mile marker we found a large stack of ties with a burned area next to it (Attachment A, photo #9). The burned area held ash, cinders, and Styrofoam packing for test tubes which had been partially melted by the fire. There was cut brush stacked on top of the ties. Based on the size of the burn area and lack of re-vegetation (short time since the burn occurred) we selected this as an area to be sampled on our return trip back to the vehicles. Many of the plants along the tracks were withered and dead. We were uncertain if the cause of this was the recent cold weather, contamination, or normal herbicide application by the railroad. As we crossed a trestle I noted a piece of railroad tie laying on the driftwood accumulated at the base of the trestle footing (Attachment A, photos #12-13). During the walk I observed several locations where ties were laying to the side of the tracks and overgrown with vegetation (Attachment A, photos #14-16) indicating that they had been abandoned at these locations sometime in the past. A stack of five ties was found along the side of the track and one of them showed signs of being burned (Attachment A, photo #17). Another tie was found laying in the brush along the bank of the river (Attachment A, photo #18).

At one point we found a large pile of brush that had accumulated on the far side of the river (Attachment A, photo #19). A railroad tie was mixed in with the brush (Attachment A, photo #20) indicating that it had been washed into the river and carried to this point. Further down and across the tracks were partially burned railroad ties that had been partially buried (Attachment A, photo #21). The area was approximately 15-20 meters from the tracks (Attachment A, photo #22), well removed from casual observance. I noted an orange-bellied salamander crawling on the ground near one of the partially burned ties.

We ended our westward walk at a split in the tracks where a gravel quarry appears to be in operation. Mr. Lawton pointed out that the quarry does not appear on the official topographic map and questioned if the railroad had authority to operate such a quarry. We then walked back along the tracks stopping at two locations (Attachment A, photo #23) to collect samples. Sample collection details are in Section V below.

January 28, 1999

On this date we again parked our vehicles in the same location (N 39°26.112' & W 123°42.441'). On this date we began using a Global Position System (GPS) unit to more accurately identify areas of potential contamination. The unit's accuracy varied over time and ranged from \pm 89 feet to 177 feet. We began walking in an easterly direction and found the 9-mile marker approximately 100 feet from Company Ranch Road. The first pile of ties that we encountered were approximately 0.1 miles down the tracks and consisted of 6-8 ties with significant overgrowth from the surrounding vegetation. A few feet away was a second pile of four ties.

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At 0.3 miles (N 39°26.486' & W 123°41.969') we observed approximately 7-10 ties in a pile (Attachment A, photo #31), some of which appeared to have been burned. This pile was next to power line pole #926. A short distance further on were 2-3 more ties (Attachment A, photo #32). Just past pole #925 were 7-8 more ties. These ties were directly under the power line and within 20' of Noyo River, but did not appear to have been burned. Mr. Lawton pointed out that they could not be burned here as the fire would jeopardize the power line directly above the ties.

The first burn area (Attachment A, photos #33-34) in this direction (N 39°26.592' & W 123°41.932') was next to the sign post "One Half Mile Ranch" (meaning that Company Ranch Road was 1/2 mile away). There were no significant pieces of unburned ties in the burn area, only ash and embers. The burn area was a neat rectangular shape with straight lines rather than curved lines associated with brush pile fires. Further searching in this area revealed fragments of burned ties had been tossed into the bushes (Attachment A, photo #35) away from the tracks and towards the river. Approximately 5-6 tie fragments were in the bushes. Shortly after this a pickup truck drove by us on the railroad tracks. Mr. Lawton guessed that it was the foreman checking on his work detail.

Another burn area was found 0.14 miles further down the tracks in the ditch running along the tracks. At approximately 0.7 miles from Company Ranch Road we crossed a trestle and I noted two ties on the side of the tracks and eight more ties down the hillside from the tracks (Attachment A, photo #36). Just past the trestle were approximately 10 more ties on the side of the tracks. No indication that they had been burned. Further down the tracks and on the opposite side we found a telephone junction box with power cables attached at the base of a tree. A boarded up cabin was a few meters further back in the woods away from the tracks.

A faded tie was observed 1.3 miles into our walk (N 39°26.651' & W 123°41.581'). The tie appeared to have been lodged in a tree (Attachment A, photo #37) during a flood or high water mark. Another tie was observed in the driftwood pile on a sand bar in the river (Attachment A, photo #38). A third tie was 20'-30' up slope from the river and could potentially slide into the river during a storm event. We continued on and at 1.56 miles (N 39°26.596' & W 123°41.518') we found 6-7 ties on the side of the tracks, one of which appeared to be partially buried. We spotted a female deer just past the 10-mile marker and took a GPS reading (N 39°26.591' & W 123°41.450') at the 210 foot elevation benchmark (USGS 1955) to confirm the accuracy of the GPS unit.

Four more ties (Attachment A, photo #39) were observed just past the second trestle (N 39°26.488' & W 123°41.466') down by the bank of the river. We then walked past Redwood Lodge and just before the third trestle found 9-10 more ties (N 39°26.514' & W 123°41.260'). At the west end of the trestle (Redwood Lodge side) a series of steps had been made from old railroad ties leading from the tracks down to the bank of the river. Two more ties were at the far end of the trestle on the siding. Approximately 30 feet further down the tracks were 13 ties (strewn over 7 meters) on one side (Attachment A, photos #40-41) and 30-40 ties stacked on the other side of the tracks. At 2.27 miles (N 39°26.484' & W 123°41.147') we encountered another burn pile which, based on weathering, appeared to be an older pile (Attachment A, photos #42-43). The burn pile was behind a larger pile of ties (15-20).

A large pile (30 ties) was found near the "One-half Mile Redwood Lodge" sign (N 39°26.558' & W 123°41.040'). The ties were not burned. Approximately 0.1 miles further on (N 39°26.547' & W 123°41.005') we found 6-7 ties (Attachment A, photo #45) in an old pile (overgrowth). A short ways on (N 39°26.583' & W 123°40.968') we found an old burn area with a pile of unburned ties (Attachment A, photo #47). Continuing down the tracks we found two piles of ties, 5 in one (Attachment A, photo #44) and 10-12 (Attachment A, photo #46) in the other (N 39°26.656' & W 123°40.823'). A similar pile (15-20 ties) was within 15 feet of the river further down the tracks. A cabin could be seen on the opposite side of the river from us. Two groups of ties (Attachment A, photos #48-49) were observed in the bushes (overgrown) and within a few meters of the river.

Approximately 2.8 miles from Company Ranch Road (N 39°26.709' & W 123°40.773'), we found a large (15-20 feet wide) burn area (Attachment A, photo #50) with several partially burned ties (4-5 ties). It appeared that the side of the hill, towards the river, had collapsed (Attachment A, photo #51) at some time in the past and the ties had been thrown down the slope and set on fire. The next pile of ties that we found (N 39°26.667' & W 123°40.717') had 14 ties in it and some of them appeared to have been previously burned. At the 11-mile marker we found 10 ties stretched out over 20-30 feet. One of these ties was on the bank of the river (Attachment A, photo #52). Just past the marker were two burned ties and four unburned ties off to one side (Attachment A, photo #53).

Mr. Strickland caught up with us just after 12 P.M. The next burn area we found was approximately 3 miles out from our starting point (N 39°26.623' & W 123°40.704'). The burn area was adjacent to the tracks, but had been cleared of unburned fragments (Attachment A, photo #59). We found the partially burned pieces of ties (7-10 pieces) strewn down the hillside towards the river (Attachment A, photo #60). As we walked on I observed 13 more ties (Attachment A, photo #58) on the side of the tracks and down

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the hillside in three different areas (Attachment A, photos #54-57). At approximately 3.45 miles from the vehicles we observed another pile of ties (N 39°26.464' & W 123°40.584'). There were 13 ties visible in the stack and an uncertain number of additional ties under them (Attachment A, photo #61). A few meters further on were two more ties on the side of the tracks and what appeared to be an old burn pile (N 39°26.455' & W 123°40.572').

As we continued on to Camp Little Stinkers (Boy Scout camp) I observed 21 ties in small piles on both sides of the tracks and down the hillside at six locations. There were two 100-pound propane cylinders (empty) laying next to the tracks at Camp Little Stinkers. It appeared that the cylinders were brought in by rail and these were waiting to be picked up. At the next trestle we took a break for lunch and found four burned and buried ties (Attachment A, photo #62) with a fifth tie (Attachment A, photo #63) in the river (N 39°26.484' & W 123°40.383'). Mr. Lawton said that the partially buried ties were old supports for the trestle that had been replaced after a fire. Walking onward we found two more ties on the river side of the tracks. An old burn area, heavily overgrown, was observed within a few meters of the tracks (Attachment A, photo #64). Another burn area (Attachment A, photo #65) with 1 tie still mostly intact and several pieces of other ties was our next find (N 39°26.534' & W 123°40.020'). The same truck that had passed us earlier in the day returned and the driver waved at us as he went by. As we walked Ms. Becker noticed chunks of metal that had been melted (Attachment A, photo #66). Mr. Lawton pointed out that the railroad does maintain a flatcar with a blowtorch/welder on it for service on the tracks.

As we continued on to the 12-mile marker we found a telephone pole and cross-arm in the bushes and six more ties at three locations. All of the ties were between 20 meters and 50 meters from the river. At one point we observed a drainage ditch perpendicular to the tracks and leading to the river. Mr. Lawton pointed out some fragments of ties accumulated in the soil of the ditch (Attachment A, photo #67). At the sign "One half mile Grove" we found two more ties 15 meters from the river and an old burn pile on a ledge over looking the river. One tie was over the edge and on the hillside. This burn area was very old as indicated by the new growth of small trees. At this point, due to time limitation, we split up with Mr. Lawton and Mr. Strickland continuing on another half mile to Grove to look for other areas of concern while the rest of us started our return and the associated sample collection (detailed in next section).

When we returned to our vehicles we decided to continue down the tracks westward to see if any changes had occurred from what we observed on the previous day. When we arrived at the first two sample collection points (N 39°26.013' & W 123°43.011' (first sample) and N 39°26.032' & W 123°42.954' (second sample)) we did not observe any changes. Another orange-bellied salamander was observed crawling inside of the tracks (Attachment A, photo #68). I was unaware if this type of salamander was considered an endangered species or if it was a prevalent type. This concluded our investigation for this day.

January 29, 1999

On this date I drove to the main station for the CWR to discuss the issues of waste oil and used tie management. I was met by Mr. Milliman and escorted to his office. I explained to Mr. Milliman that I had reviewed the letter sent to CWR's consultant about burning waste oil. I asked Mr. Milliman if CWR was collecting and burning waste oil from other generators. Mr. Milliman said that it was the off season for the railroad and the steam engine (only one that burns waste oil) was torn apart for a major overhaul. Mr. Milliman also stated that the consultant was still obtaining all of the necessary authorization before testing of the waste oil began.

I asked Mr. Milliman about the status of the issues raised during the previous investigation. Mr. Milliman explained that he was looking into a collection system that would collect the oil leaking from the trains and pump it directly into storage containers. Mr. Milliman said that he had taken no action on the contaminated soil or ash because he had not received a notification from DTSC as to what he had to do. Mr. Milliman explained that unless DTSC gave him specific directions on what was to be done with the soil and ash he would not take any actions. I told Mr. Milliman that the soil was contaminated with high levels of waste oil and that the ash had hazardous levels of toxic metals. I asked Mr. Milliman to make a hazardous waste determination for the ash, but gave him no specific directions about cleaning up the contaminated soil. I then asked Mr. Milliman how CWR manages its used railroad ties. Mr. Milliman told me that the used ties are resold in town for landscaping. According to Mr. Milliman, some of the used ties are stored at the station, but the majority are left along the tracks. The ties are sold directly from CWR to the public and Mr. Milliman said there was no tracking system for the sales of the ties other than the accounting balance sheets which showed the proceeds from all sales.

I asked Mr. Milliman if CWR had an official policy or procedure for keeping people from walking along the tracks. Mr. Milliman said that CWR's official policy was that people were not allowed to walk along the tracks without permission, but that there was no mechanism to grant permission. Mr. Milliman explained that the land is owned by Georgia-Pacific Lumber (GPL) and CWR operates on a right-of-way lease. According to Mr. Milliman, permission to walk along the property has to come from GPL. Mr. Milliman said

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that hikers, dirt bikes, and transients are commonly seen along the tracks. Mr. Milliman also pointed out that some people lived along the tracks and various hunters and fishers used the tracks as walkways for their sports interests. In general, Mr. Milliman conceded that the tracks are often used by the public and CWR has not taken any steps to prevent this activity (posting signs, gates, etc.).

Mr. Milliman questioned his foreman about the management of railroad ties. They both agreed that the practice of burning the ties was conducted in the past, but has not been done recently. They both stated that there were numerous ties along the tracks at this time and neither considered it a problem. I told Mr. Milliman that I had walked along the tracks and observed several areas where it appeared that ties had been burned. I also explained that some of the burn areas had not been washed out by rain indicating that they were relatively recent. Mr. Milliman assured me that he did not know what had happened and that the CWR does not burn ties any longer. Mr. Milliman told me that no ties had been changed out in the last several months as the only work being done has been to trestles. Mr. Milliman told me he had laid off half his maintenance workforce in November 1998 and only four men were still working to maintain the tracks at this time. Mr. Milliman offered to give me access to the rail line equipment to survey the tracks anytime it is needed. The foreman stated that redwood ties are commonly burned. I assured him that the redwood ties were not treated and could be burned without restriction from DTSC.

The foreman then escorted me to the storage area where the used ties are stored. I counted 17 ties in this area and the foreman pointed out an additional 15 ties which he said were also used. All of the ties looked to be new or nearly new in condition. I thanked the foreman and Mr. Milliman for their time and departed.

On February 12, 1999 I received a letter from Mr. Milliman (Attachment I) documenting the actions CWR has taken to date in response to the first investigation, the pending collection of railroad ties from the tracks for disposal, the opinion that no burning has occurred in the last year, and a request for analytical results from the last two investigations. On February 17, 1999 I called Mr. Milliman to caution him that there is a certain level of risk in having his personnel cleanup the ash from the burned ties. I told Mr. Milliman that all of the literature I had reviewed indicated that the ash could cause contact dermatitis, headache, and/or nausea. I urged Mr. Milliman to warn his staff and to use proper personal protective equipment if he was going to require them to cleanup the ash. I encouraged Mr. Milliman to have the unburned ties picked up and resold for a profit.

On February 18, 1999, I spoke with Warden Tom Riley of the California Department of Fish and Game (DFG) about this case. Warden Riley expressed interest in participating in the case and suggested that I speak with Mr. Scott Harris who is a biologist for DFG and Warden Bob Aldridge. In my discussion with Mr. Harris I learned that Noyo River is a primary river for Coho Salmon and other protected species found in this area include, but are not limited to steelhead trout, prickly sculpin, 3-spine stickleback, pacific giant salamander, black salamander, arboreal salamander, California slender salamander, red-legged frog, yellow-legged frog, tailed frog, and the pacific tree frog. Later on that day I contacted Ms. Jan Gobel, North Coast Regional Water Quality Control Board (NCRWQCB) about this case. Ms. Gobel informed me that Mr. Milliman was the former City Administrator for the city of Fort Bragg. During the course of the day I discussed this case with Mr. Ed Doty, Special Investigator with DTSC and he informed me that Mr. Milliman had been involved in another railroad further north. Mr. Doty had investigated that case which included the illegal burning of railroad ties and soil contamination from disposal of waste oil to the ground. I also called Warden Aldridge, who had worked with Mr. Doty on the other railroad case, to discuss his knowledge of this case. Warden Aldridge confirmed that it was one of his informants that had alerted him to CWR's burning of the ties and he in turn had called Mr. Lawton. Warden Aldridge also confirmed that Mr. Milliman had been an officer in the other railroad at the time of his investigation.

On February 19, 1999, I spoke with Mr. Lawton about the status of this report and the analytical results collected to that time. During the conversation I learned that when Mr. Lawton conducted his first walk along the tracks, approximately six weeks prior to our walk, the area under the tree with the burned branches (second set of samples) had not been burned at that time. Mr. Lawton informed me that he had pictures of a pile of partially burned ties in the ditch under the tree and the branches of the tree had not been burned at that time. Mr. Lawton stated his opinion that the partially burned ties had been moved from another location to this area and then burned a second time under the tree catching the branches on fire.

V. SAMPLE COLLECTION SUMMARY

All samples were collected with new, unused, plastic trowels and placed into new, unused, glass jars. Teflon lined lids were tightly affixed to the jars immediately after sample collection and evidence tap was placed over the top of the lid. The sample was then documented with a photograph. All samples were placed into an ice chest, with blue ice, at the end of each day and the ice chest was maintained in a locked vehicle at all times. I was the maintained control of the keys for the vehicle at all times during the sampling event. Nitrile gloves were worn during sample collection and a new pair of gloves was put on for each

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sample. Tyvek boot covers were used to minimize potential contamination on footwear and spreading of the contamination during our sojourn. The samples were maintained under our custody until delivered to the Hazardous Materials Laboratory (HML) on January 29, 1999. Due to a slight oversight, not all copies of the Sample Analysis Request form (chain-of-custody) were signed until February 5, 1999. The samples were maintained in HML's locked refrigerator during the intervening week. All hold times for the analysis were met. The samples were analyzed for soluble & total metals (Attachment C), semi-volatile organics (Attachment D), or dioxin (see Addendum Report). Soluble metals concentrations were determined using both the Federal Toxicity Characteristic Leaching Procedure (TCLP) and the California Waste Extraction Test which is then compared to the Soluble Threshold Limit Concentration (STLC). This was done to determine if the waste was both State and Federally regulated or State regulated only.

Sample #	Location/Description	Metals Analysis	Semivolatile Analysis	Dioxin Analysis
CWR0199-1	(N 39°26.013' & W 123°43.011') burn area & pile with Styrofoam	Arsenic - 89.6 mg/kg STLC 5.12 mg/L Chromium - 69.5 mg/kg Copper - 180 mg/kg	Anthracene - 7.6 mg/kg Benz (a)anthracene - 95 mg/kg Benzo(a)pyrene - 65* mg/kg (estimate) Benzo(b)fluoranthene - 210* mg/kg (estimate) Benzo(g,h,i)perylene - 21* mg/kg (estimate) Chrysene - 180 mg/kg Fluoranthene - 210 mg/kg Indeno (1,2,3-cd) pyrene - 22 mg/kg Phenanthrene - 14 mg/kg Pyrene - 250 mg/kg Benzo (ghi) fluoranthene - 13 mg/kg (TIC) Methylpyrene - 41 mg/kg (TIC 2 isomers) 4-cyclopenta (def) phenanthrene - 21 mg/kg (TIC) 7H-benz(de)anthracen-7-one - 32 mg/kg (TIC 2 isomers) Benzo(h)quinoline - 14 mg/kg (TIC) Dimethylphenanthrene - 25 mg/kg (TIC 2 isomers) 2-phenylnaphthalene - 11 mg/kg (TIC) Methylphenanthrene - 10 mg/kg (TIC)	Not analyzed
CWR0199-2	(N 39°26.013' & W 123°43.011') burn area & pile with styrofoam	Not analyzed	Not analyzed	Total Dioxin & Furan Toxic Equivalents 700 parts per trillion (ppt)
CWR0199-3	(N 39°26.013' & W 123°43.011') hillside opposite CWR0199-1	Arsenic - 6.61 mg/kg Chromium - 17.1 mg/kg Copper - 30.7 mg/kg	All < 2 mg/kg	Not analyzed

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CWR0199-4	(N 39°26.032' & W 123°42.954') burn area under tree w/burnt branches	Arsenic - 313 mg/kg STLC 21.7 mg/L TCLP 5.45 mg/L Chromium - 235 mg/kg Copper - 343 mg/kg	Benz(a)anthracene - 1.5 mg/kg Benzo(b)fluoranthene - 2.5 mg/kg Chrysene - 3.2 mg/kg Dibenzofuran - 1.2 mg/kg Fluoranthene - 3.2 mg/kg Naphthalene - 1.8 mg/kg Phenanthrene - 2 mg/kg Pyrene - 3.5 mg/kg 2-methylnaphthalene - 1.6 mg/kg 2-furancarboxaldehyde - 7 mg/kg (TIC) 5-methyl-2-furancarboxaldehyde - 2 mg/kg (TIC) Dibutylphthalate - 7 mg/kg (TIC) 2 fatty acids - 3 & 6 mg/kg (TIC) 3 alkanes (C11-C13) - 2 to 3 mg/kg (TIC) Butylbenzene - 2 mg/kg (TIC) 4-hydroxy-3-methoxybenzaldehyde - 3 mg/kg (TIC) 4 unknowns - 2 to 4 mg/kg	Not analyzed
CWR0199-5	(N 39°26.032' & W 123°42.954') burn area under tree w/burnt branches	Not analyzed	Not analyzed	Total Dioxin & Furan, Toxic Equivalents 140 ppt
CWR0199-6	(N 39°26.032' & W 123°42.954') burn area under tree w/burnt branches	Arsenic - 130 mg/kg STLC 7.97 mg/L Chromium - 54.1 mg/kg Copper - 93.4 mg/kg	2-methylnaphthalene - 1.3 mg/kg	Not analyzed
CWR0199-7	(N 39°26.609' & W 123°40.645') burn area cleared of debris	Arsenic - 8,850 mg/kg STLC 432 mg/L TCLP 83.0 mg/L Chromium - 4,350 mg/kg Copper - 10,800 mg/kg STLC 471 mg/L	All < 2 mg/kg	Not analyzed
CWR0199-8	(N 39°26.707' & W 123°40.810') large burn area	Arsenic - 26,300 mg/kg STLC 807 mg/L TCLP 90.9 mg/L Chromium - 4,750 mg/kg Copper - 18,700 mg/kg STLC 496 mg/L	All < 2 mg/kg	Not analyzed

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CWR0199-9	(N 39°26.707' & W 123°40.810') large burn area	Arsenic - 3,350 mg/kg STLC 551 mg/L TCLP 65.4 mg/L Chromium - 954 mg/kg Copper - 2,140 mg/kg STLC 178 mg/L	All < 2 mg/kg	Not analyzed
CWR0199-10	(N 39°26.707' & W 123°40.810') large burn area	Not analyzed	Not analyzed	Total Dioxin & Furan Toxic Equivalents 45 ppt
CWR0199-11	(N 39°26.707' & W 123°40.810') large burn area	Not analyzed	Not analyzed	Total Dioxin & Furan Toxic Equivalents 370 ppt
CWR0199-12	(N 39°26.591' & W 123°41.930') first burn area to east	Arsenic - 2,740 mg/kg STLC 197 mg/L TCLP 58.3 mg/L Chromium - 1,290 mg/kg Copper - 2,280 mg/kg STLC 80.7 mg/L	Fluoranthene - 2.2 mg/kg Phenanthrene - 2.6 mg/kg Pyrene - 2.7 mg/kg	Not analyzed
CWR0199-13	(N 39°26.591' & W 123°41.930') first burn area to east	Not analyzed	Not analyzed	Total Dioxin & Furan Toxic Equivalents 580 ppt

Bold text indicates sample exceeded the regulatory limit for that element or compound. Regulatory limits: Total Arsenic - 500mg/kg; Soluble Arsenic (STLC & TCLP) - 5mg/L; Total Copper - 2,500mg/kg; Soluble Copper - 25mg/L; Total Chromium - 2,500mg/kg; Soluble Chromium - 560mg/L; Semivolatile analysis - regulated based on risk; Tentatively Identified Compound (TIC) found during semivolatile analysis - regulated based on risk.

The first sample collected, CWR0199-1 (Attachment A, photo #25), was from the ash, embers, and soil of the burn area (Attachment A, photo #24) near the 8-mile marker (N 39°26.013' & W 123°43.011'). A large pile of ties with brush on top was next to the burned area. Mr. Aragon collected the sample while Ms. Becker assisted. The sample was scooped from the top inch of ash, embers, and soil and submitted for metals and semivolatile organics analysis. The total metals analysis was below regulatory limits, but the soluble metals analysis did show soluble arsenic was at the regulatory limit making this a hazardous waste. The semivolatile analysis showed the presence of various chemical compounds associated with organic-based wood preservatives. Some of these organic chemical compounds are known/suspected carcinogens and do not degrade quickly in the environment.

The second sample collected, CWR0199-2 (Attachment A, photo #26), was from the ash and embers of the burn area (Attachment A, photo #24) near the 8-mile marker (N 39°26.013' & W 123°43.011'). This sample was collected by Ms. Becker from the top layer of ash in the area (composite) and was submitted for dioxin analysis. The dioxin analysis is reported as a total toxic equivalent because it adds together the relative toxicity of each dioxin isomer and the toxicity of the furan isomers. Sample CWR0199-2 was found to contain 700 ppt total dioxin and furan based on relative toxicity. While this concentration is below the regulatory limit for hazardous waste it is considered as a factor in the overall risk assessment.

The third sample collected, CWR0199-3 (Attachment A, photo #27), was from the surface soil (top inch) on the hill side on the opposite side of the tracks from samples CWR0199-1 & CWR0199-2 (N 39°26.013' & W 123°43.011'). Mr. Pixton collected this sample without assistance. This sample was collected for background metals and semivolatile organics analysis. The metals analysis (total and soluble) did not show elevated levels of toxic metals. Similarly, the semivolatile analysis showed no elevated levels of potentially carcinogenic compounds. This sample represents the background forest concentrations of the compounds of interests for this investigation.

The fourth sample collected, CWR0199-4 (Attachment A, photo #28), was from ash, embers, and soil under a partially burned tie. This sample site was approximately 80-100 meters from the previous three

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samples (N 39°26.032' & W 123°42.954') and directly under the tree with burned branches 20' up (Attachment A, photo #6). Ms. Becker collected the sample with Mr. Aragon assisting. This sample was submitted for metals and semivolatile organics analysis. The total metals analysis did not exceed regulatory limits. The soluble metals analysis showed that soluble arsenic was above the regulatory limit making this a hazardous waste. Analysis of the soluble metals was done using both the STLC (State) and TCLP (Federal) extraction procedures. The results showed that this hazardous waste is regulated by the Resource Conservation and Recovery Act (RCRA) under Federal law as well as by California law. The semivolatile analysis show the presence of various compounds associated with organic-based wood preservatives and their decomposition byproducts. Some of these organic chemical compounds are known/suspected carcinogens and do not degrade quickly in the environment. The concentrations were significantly lower and different than those found at CWR0199-1 supporting Mr. Lawton's assertion that previously burned ties had been stacked here six to seven weeks prior to this sampling and then re-burned in that intervening time.

The fifth sample collected, CWR0199-5 (Attachment A, photo #29), was from ash and embers under a partially burned tie. This sample site was approximately 80-100 meters from the previous three samples (N 39°26.032' & W 123°42.954') and directly under the tree with burned branches 20' up (Attachment A, photo #6). Ms. Becker collected the sample with Mr. Aragon assisting. This sample was submitted for dioxin analysis. Sample CWR0199-5 was found to contain 140 ppt total dioxin and furan based on relative toxicity. While this concentration is below the regulatory limit for hazardous waste it is considered as a factor in the overall risk assessment.

The sixth sample collected, CWR0199-6 (Attachment A, photo #30), was from ash, embers, and soil under another partially burned tie in the same area as sample CWR0199-4. This sample site was approximately 80-100 meters from the previous three samples (N 39°26.032' & W 123°42.954') and directly under the tree with burned branches 20' up (Attachment A, photo #6). Ms. Becker collected the sample with Mr. Aragon assisting. This sample was submitted for metals and semivolatile organics analysis. The total metals analysis did not exceed regulatory limits. However, soluble arsenic was above the regulatory limit making this a hazardous waste. Only one compound was found above reporting limits for the semivolatile analysis. This sample was collected from a ditch and in comparing the results from sample CWR0199-4 to this one (both taken from same area 3 feet apart) the possibility exists that the ties above this portion of the burn area had been more completely burned than those above CWR0199-4.

The seventh sample collected, CWR0199-7 (Attachment A, photo #69), was from ash and embers (composite) of the burn area (Attachment A, photo #59) that had been cleared of unburned fragments (N 39°26.609' & W 123°40.645' ± 109 feet (second GPS reading at same site)). Ms. Becker collected the sample while Mr. Aragon assisted. This sample was submitted for metals and semivolatile organics analysis. Metals analysis showed elevated concentrations of arsenic (8,850 mg/kg), chromium (4,350 mg/kg), and copper (10,800 mg/kg). These concentrations are above the regulatory limits for total arsenic (500 mg/kg), total chromium (2,500 mg/kg) and total copper (2,500 mg/kg) making this burn residue a hazardous waste. Soluble metals analysis further supports the hazardous waste identification in that the arsenic and copper were one or two orders of magnitude above their regulatory limits. Based on the TCLP analysis, this waste is regulated under RCRA.

The eighth sample collected, CWR0199-8 (Attachment A, photo #70), was from the ash, embers, and soil (composite) of the large burn area (Attachment A, photo #50) where the bank next to the tracks had collapsed (N 39°26.707' & W 123°40.810' second reading at site). Mr. Aragon collected the sample while Ms. Becker assisted. A portion of the burn area was bright green (indicative of metal-based preservative) and was the main component of the sample. This sample was submitted for metals and semivolatile organics analysis. Metals analysis showed elevated concentrations of arsenic (26,300 mg/kg), chromium (4,750 mg/kg), and copper (18,700 mg/kg). These concentrations are above the regulatory limits for total arsenic (500 mg/kg), total chromium (2,500 mg/kg) and total copper (2,500 mg/kg) making this burn residue a hazardous waste. Soluble metals analysis further supports the hazardous waste identification in that the arsenic and copper were one or two orders of magnitude above their regulatory limits. Based on the TCLP analysis, this waste is regulated under RCRA.

The ninth sample collected, CWR0199-9 (Attachment A, photo #71), was from the colorful ash, embers, and soil (composite) in the same area as sample CWR0199-8. Ms. Becker collected the sample, selecting only the colorful ashes and embers, with Mr. Aragon assisting. This sample was submitted for metals and semivolatile organics analysis. Metals analysis showed elevated concentrations of arsenic (3,350 mg/kg), chromium (954 mg/kg), and copper (2,140 mg/kg). The concentration of total arsenic is above the regulatory limit (500 mg/kg) making this burn residue a hazardous waste. Soluble metals analysis further supports the hazardous waste identification in that the arsenic and copper were one or two orders of magnitude above their regulatory limits. Based on the TCLP analysis, this waste is regulated under RCRA.

The tenth sample collected, CWR0199-10 (Attachment A, photo #72), was from the ash and embers (composite) in the same area as samples CWR0199-8 and CWR0199-9. Ms. Becker collected the sample

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with Mr. Aragon assisting. This sample was submitted for dioxin analysis. Sample CWR0199-10 was found to contain 45 ppt total dioxin and furan based on relative toxicity. While this concentration is below the regulatory limit for hazardous waste it is considered as a factor in the overall risk assessment.

The eleventh sample collected, CWR0199-11 (Attachment A, photo #73), was from the ash and embers (composite) in the same area as samples CWR0199-8 and CWR0199-9. Ms. Becker collected the sample with Mr. Aragon assisting. This sample was submitted for dioxin analysis. Sample CWR0199-11 was found to contain 370 ppt total dioxin and furan based on relative toxicity. While this concentration is below the regulatory limit for hazardous waste it is considered as a factor in the overall risk assessment. The difference between CWR0199-10 and CWR0199-11 reflects the heterogeneity of the ash due to different types of ties being burned and wind dispersion of the ash.

The twelfth sample collected, CWR0199-12 (Attachment A, photo #74), was from the ash, embers, and soil (composite) of the first burn area (Attachment A, photo #33) we encountered on 1/28/99 at the "One half mile Ranch" sign post (N 39°26.591' & W 123°41.930' second reading at same site). Ms. Becker collected the sample while Mr. Aragon assisted. This sample was submitted for metals and semivolatile organics analysis. Total metals analysis showed elevated concentrations of arsenic (2,740 mg/kg), chromium (1,290 mg/kg), and copper (2,280 mg/kg). The concentration of total arsenic is above the regulatory limit (500 mg/kg) making this burn residue a hazardous waste. The soluble arsenic and copper were also above regulatory limits supporting the hazardous waste identification. Based on the TCLP analysis, this waste is regulated under RCRA.

The thirteenth sample collected, CWR0199-13 (Attachment A, photo #75), was from the ash and embers (composite) in the same area as CWR0199-12. Ms. Becker collected the sample while Mr. Aragon assisted. This sample was submitted for dioxin analysis. Sample CWR0199-13 was found to contain 580 ppt total dioxin and furan based on relative toxicity. While this concentration is below the regulatory limit for hazardous waste it is considered as a factor in the overall risk assessment.

Based on the analytical results it is clear that hazardous waste has been abandoned on the soil along the railroad tracks and poses a significant risk to the environment. Due to the limited number of sample locations and the concentrations of contaminants found, it would be prudent to conduct a more thorough investigation of the tracks to obtain a better idea as to the extent of the contamination. Further sample collection may be warranted to support that assessment.

In reviewing toxicological literature (Attachment E) I noted that arsenic is considered more toxic and persistent than copper or chromium. It appears that the arsenic will cycle through the aqueous, sediment, and biota phases of a surface water system and be available for uptake during any point of the cycle. The toxicity and carcinogenicity of arsenic is well documented. Protective equipment is recommended for cleanup of fire residue to minimize potential exposure to dermal toxicity. These analytical results were provided to the California Department of Fish and Game and the North Coast Regional Water Quality Control Board for their review in determining potential violations, risks, and corrective actions.

V. VIOLATIONS

Summary of Violations attached?

Yes

No

1. Illegal disposal

On or about January 27, 1999, California Western Railroad (CWR) violated HSC, section 25189.2 (c) in that the CWR disposed of hazardous waste railroad ties and ash from the burning of treated railroad ties at various points along the Noyo River and/or its railroad tracks. Numerous locations along the tracks and river were observed where railroad ties had been abandoned, as evidenced by vegetative overgrowth, over several miles of track. Multiple burn areas, with hazardous waste ash still in place, were also observed over the same range.

2. Illegal treatment

On or about January 27, 1999, CWR violated HSC, section 25250.5 (a) in that the CWR burned chemically treated (preserved) railroad ties without prior authorization from DTSC. Chemically treated railroad ties may be resold for landscaping or legally disposed of in permitted landfills. CWR elected to burn ties along its tracks and near the Noyo River without authorization from any regulatory agencies.

VI. CONCLUSIONS

At the end of my interview with Mr. Milliman on January 29, 1999 I thanked him for his time and

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cooperation. During the writing of this report I coordinated with the other agencies involved in the Mendocino County Taskforce to ensure a consistent and representative action was taken.

Michael Burton
Hazardous Substances Scientist

April 9, 1999
Date

VII. ATTACHMENTS

- A. Photographs - 37 pages
- B. Facility Map - 2 pages
- C. Metals Analysis Results - 12 pages
- D. Semi-volatile Analysis Results - 18 pages
- E. Toxicological information - 28 pages
- F. Complaint #02-1298-0083 - 3 pages
- G. HSC & DTSC proposed management - 12 pages
- H. Industry Literature on tie disposal - 18 pages
- I. February 10, 1999 letter - 2 pages