

FINAL

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FLORIDA TIRE RECYCLING, INC WASTE TIRE SITE:

SITE CONDITIONS AS OF APRIL 29, 1994

Prepared for

The Florida Department of Environmental Protection

by

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DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Florida Tire Recycling Site
Site Condition - 4/29/94
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FLORIDA TIRE RECYCLING INC SITE CONDITIONS

OBJECTIVE

The Florida Tire Recycling Inc Site (called Florida Tire) is the largest identified accumulation of whole and shredded waste tires within the State of Florida. Florida Tire and the Florida Department of Environmental Protection (DEP) have entered into a Stipulation Order dated January 13, 1994 governing stabilization and abatement of the site.

Historical site conditions and quantity estimates have been documented in previous reports prepared by T.A.G. Resource Recovery for DEP, including baseline conditions as of January 25, 1994. Since the site has remained active, it was re-examined on April 29, 1994 (106th day after signing of the Stipulation Order). The objective of this visit was to document current site conditions and progress made in achieving specific benchmarks outlined in the Stipulation Order.

SITE CONDITIONS

A schematic representation of site conditions as of April 29, 1994 is provided in Appendix A. The schematic illustrates the following changes in site conditions between January 25, 1994 and April 29, 1994:

Removal/Relocation of Piles Containing Whole Tires

Florida Tire has continued to remove, process and/or relocate piles containing whole tires. Their stated objective is to clear areas for future redeployment of their large shred piles into smaller isolated piles that conform to size restrictions contained in DEP's waste tire rules.

Between January 25th and April 29th, most of piles T-10, T-11, T-18, T-21 and T-22 were removed. These piles previously contained a mixture of truck, off-road and rimmed tires. It appears that the truck and smaller off-road tires have been shredded, while off-road tires that were too large for their processing equipment have been left in the pile areas or consolidated into the split segments of T-15. Resulting shreds have been transported to landfills for disposal or added to existing shred piles.

Off-road tires contained in the fire lane area of pile T-15 were relocated to adjacent segments of this pile, increasing the area and depth of these segments. As a result of these changes, whole tires remained only in all or portions of piles T-3, T-7, T-10, T-11, T-15, T-16, T-18 and T-20. With the exception of piles T-3 and T-7, practically all of the remaining tires are off-road sizes beyond the processing capability of Florida Tire's shredders.

Initiation of Fire Lanes in Shred Piles

During the second half of 1993 (prior to completion of the court agreement), Florida Tire created narrow fire lanes within the main shred pile. These fire lanes were only 8 to 10 feet wide with sharp vertical walls, representing a path generated by one pass of their large loader through the pile.

Between January 25th and April 29th, fire lanes designated FL-1 and FL-3 were broadened and FL-2 was created. The stabilization plan recommended that each of these fire lanes be 100 feet wide due to the size and depth of remaining pile segments. A scaled schematic depicting fire lanes FL-1, FL-2 and FL-3 as 100 feet wide was incorporated in the Stipulation Order. Although DEP waste tire storage rules require fire lanes to be a minimum of 50 feet wide, these fire lanes were only approximately 40 feet wide as of April 29th. In addition, fire lane FL-4 had been cleared. Shreds had been removed down to ground level within these fire lanes so that only trace quantities of shreds remaining in the soil mixture. Fire lanes FL-5 and FL-6 should have been 50 feet wide, but remained narrow and had not been cleared to ground level. Due to their narrow width, none of these fire lanes provide the intended impediment to transmission of fire between adjacent pile segments.

Shred Pile Changes

Based on comparison of on-site observations and aerial photographs on January 25, 1994 and April 29, 1994, shred pile dimensions were altered in the interim period. Shreds had been added to the upper elevations of piles S-2, S-3 and S-8 as indicated by newly-created ramps for heavy equipment access. Changes in pile contours and surface coloring confirm such additions. A new brownish color indicated recent deposition of dirt-contaminated shreds from the fire lanes.

Some shred pile dimensions and contours also changed. For instance, the previously open area to the northwest of S-5 had been completely filled with shreds, effectively increasing the surface area of the pile. The southern part of S-6 had been removed, apparently in an effort to clear space for the perimeter roadway.

A smaller pile of coarse shreds in this area was reportedly being staged for landfill disposal.

Shred Dispersion

Most of the western portion of the site remained covered with shreds as of April 29, 1994. Shred depth ranged from 1 to 4 feet depending on location. Photo documentation at the northern edge of piles T-3 and T-5 (where ground level was still exposed) indicated adjacent shred depth still approached 4 feet as of April 29th.

Based on comparative photographs and on-site observations, shreds previously dispersed on the ground at the southwestern corner of the site and in fire lane 4 had been scraped into adjacent rows of shreds, resulting in no net quantity reduction. Florida Tire's stated objective in scraping dispersed shreds from the southwestern corner was to clear an area for construction of pads to elevate future reconfigured shred piles above the 25-year, 3 day storm event level as required to control potential environmental impact associated with leaching.

Areas previously containing whole tire piles remained covered with a mixture of whole tires and shreds, with the exception of T-1, T-5 and parts of T-10 and T-11. There was no apparent change in the quantity of dispersed shreds between January 25th and April 29th with the exception of shreds removed from fire lanes within the shred pile area. The average effective shred depth across the western portion remained at the previously estimated 2 feet. Shreds in areas traveled by heavy equipment had been compacted and mixed with underlying soil. Shreds spread over this large area continue to represent a significant cumulative volume.

Continuing dispersion of a thick layer of shreds over most of the property significantly increases potential environmental and public health hazards associated with the site for two primary reasons. First, the dispersed shreds provide a mechanism for fire propagation, allowing a fire to spread rapidly over the entire area and compounding the difficulty associated with controlling environmental consequences. When shreds are stored in isolated small piles separated by adequate fire lanes, environmental damage can be controlled through isolation of smaller involved areas. However, shreds spread over a large area allow rapid involvement that jeopardizes manpower and equipment and virtually precludes any opportunity for control through isolation. The quantity of dense black smoke (containing hazardous chemicals) generated from a fire over this large area could potentially have a significant detrimental impact on air quality within a broad area for an extended period of time.

In addition, the inability to isolate and control a fire would also result in dispersion of pyrolytic oils (historically containing potentially carcinogenic chemical compounds) over a large area. Penetration of pyrolytic oils into the underlying water table could impact water quality. Ultimate site remediation cost could be significantly increased, potentially involving millions of dollars based on historical experience.

Since tires can pyrolyze in the absence of oxygen, covering shreds with soil does not necessarily prevent fire propagation. Tires and shreds covered with soil to extinguish fires have continued to generate large quantities of pyrolytic oils for extended periods. As a result, roadways constructed over a thick base of shreds do not necessarily provide a fire break and can become unstable if the shreds pyrolytically decompose.

The second major factor associated with dispersion of shreds over a large area at Florida Tire is potential leaching of hazardous chemicals from the shreds. Since standing water is apparent in clear areas, it appears that portions of these shreds are submerged in water and subject to leaching. Standing water around surface shreds had a dark orange color indicative of iron leached from exposed wire contained in tire shreds. If toxic organic or inorganic compounds are leached from shreds at the site, these materials are likely to penetrate through underlying porous soil into the water table.

Leachate studies have been conducted to assess the environmental impact of waste tire shred use in civil engineering applications. Copies of reports covering leaching characteristics were provided to Mr. Joe Kahn of DEP. The general conclusion is that potentially toxic inorganic and organic compounds can be leached from shreds depending on pH exposure conditions. pH conditions are site specific and can be seasonally dependent. As a result, some states (such as Minnesota) currently allow use of shreds in road bed construction only at levels above the mean or maximum water level so that shreds are not exposed to possible sub-surface leaching conditions. In addition, such road beds are capped with a low-permeability surface like asphalt.

Unless Florida Tire can demonstrate that materials are not leached from shreds under their specific site conditions using established testing/analytical protocols, the area of shreds submerged in surface water should be minimized to control possible ground water contamination.

Drainage Ditch Construction

The drainage ditches constructed along the southern and western perimeters in late 1993 by Florida Tire remained unchanged from the January visit. The southern ditch extended the full length of the property and was located just inside the perimeter roadway. The ditch was 6-8 feet wide and reportedly 2-4 feet deep. This ditch impedes site access from the southern perimeter roadway by fire-fighting equipment and personnel, including blocking access to the western perimeter. Fire control vehicles entering the southern access roadway have no forward exit, a dangerous condition under adverse fire conditions. The narrow sand plug installed at the eastern property boundary reportedly washed out during period of heavy rain but had been replaced.

The western ditch was located near the property line, outside of the intended perimeter roadway. It extended beyond the power lines and connected with drainage channels from adjacent property at several points. A drainage channel that previously existed along the property boundary with Miami Tank remained filled with shreds, effectively blocking water movement. These shreds would also allow a fire to move even closer to the rail siding, increasing the probability of chemical rail car involvement if a fire occurs.

Perimeter Road Construction

As of January 25, 1994, the perimeter roadway along the southern property boundary consisted of a raised sand base 25-30 feet wide. At that time, the roadway had been leveled and compacted but its ability to support fully-loaded fire fighting equipment appeared to be questionable. As of April 29th, surface soil from part of the roadway had been removed, making it uneven and clearly impassable for heavy equipment.

An unstable layer of shreds had been placed along remaining perimeter areas, apparently intended to serve as a base for future construction of the perimeter roadway. A layer of sand had been placed along portions of the western perimeter. However, it was unstable to foot traffic and clearly impassable for heavy fire trucks.

Since the effective range of fire-fighting equipment is limited, prompt completion of stable, continuous perimeter and central access roadways represents a critical factor in implementation of an effective fire control plan. However, no observable progress had been made in completion of perimeter of

central access roadways between January 25th and April 29th. In fact, the southern roadway was less passible during the April visit.

Perimeter Fencing And Lighting

There did not appear to be any change in perimeter fencing between January 25th and April 29th, but none was required by the Stipulation Order. The southern and western site perimeter were enclosed by a 4-strand barbed wire fence. The southern fence previously appeared to have been moved further south, effectively increasing the distance between the perceived property line (fence) and stored tires/shreds. Since DEP's waste tire storage rules require all tires to stored at least 50 feet from the property boundary, the southern property boundary should still be verified by certified survey prior to relocation of shreds into storage piles along this perimeter. It would be counter-productive for Florida Tire to have to relocate shreds twice due to an improper definition of their property line.

A chain link fence existed along portions of the east-west boundary between Florida Tire and the adjacent industrial facilities, but there was no perimeter fence along the remaining portions of the tire/shred storage area. The southern perimeter roadway entrance from Range Line Road was partially blocked by a fixed wooden fence, but was not gated to allow access by fire-fighting equipment.

As of April 29th, additional perimeter lighting along Range Line Road had been installed, but its compliance with lighting intensity requirements of the agreement could not be evaluated since our visit was necessarily conducted during daylight hours.

ESTIMATED QUANTITY

T.A.G. Resource Recovery (TAG) estimated that the site contained approximately 6,871,800 passenger tire equivalents (PTE) as of April 29, 1994, representing a reduction of approximately 342,300 PTE or 3,423 tons since January 25, 1994. The revised quantity estimate was prepared based on surface observations and aerial photographs taken on April 29, 1994.

File Characteristics and Quantities

Whole tire piles were estimated to contain a total of 375,600 PTE as of April 29, 1994, representing a net reduction of 87,600

PTE from the estimated 463,200 PTE present on January 25, 1994. A summary of waste tire quantity calculations reflecting site conditions as of this date is provided in Appendix B.

Passenger and truck tires contained in piles T-19, T-21, T-22, and portions of T-10, T-11 and part of T-18 on January 25, 1994 had been removed, moved or processed as of April 29, 1994. The remaining two piles of stacked truck tires (designated T-3 and T-7 in Appendix A) were 9 tires high (approximately 7 feet) and occupied 1,400 and 1,050 square yards, respectively. Based on a measured density of 18 PTE/cubic yard, these piles continued to contain a total of approximately 102,800 PTE as of April 29th.

Off-road tires or mixtures of off-road/large truck tires remained in piles T-10, T-11, T-15, T-16, T-18, and T-20. Off-road tires removed from fire lanes and other pile areas had been added to pile T-15, increasing its surface area and depth. This pile is almost directly under the FP&L power lines.

These off-road tire piles were irregularly shaped, occupying surface areas of 240 - 2,400 square yards each. Average effective pile heights ranged from 6 to 12 feet. The density of the off-road and mixed piles is estimated to be 18 PTE/cubic yard. This density is difficult to establish due to varying weights associated with different ply thicknesses for similarly sized tires. Therefore, this density should be reviewed based on site experience as off-road tires are processed and removed.

The total quantity of mixed off-road/large truck tires was estimated to be 272,858 PTE as of April 29th, representing a reduction of 82,442 PTE since January 25, 1994. As previously stated, most of this reduction represented processing of passenger and truck tires previously mixed in these piles. The remaining tires appear to be too large to be processed in Florida Tire's equipment. The total quantity of whole tires was estimated to be 375,611 PTE.

The total quantity of shredded tires on the site as of April 29, 1994 was estimated to be 6,456,900 passenger tire equivalents (64,569 tons), representing an estimated reduction of 2,940 tons since January 25th. This estimate was based on aerial photographs, site observations and surface measurements taken on April 29th, using the same techniques described fully in previous documents.

The contour of some shred pile segments had changed since January 25th as a result of Florida Tire's continuing shred movement. Additional shreds had been added to the top of piles S-1, S-2, and S-3 even though the Stipulation Order requires

reduction in pile depth to a maximum of 15 feet. In addition, pile surface areas were altered as a result of shred removal from fire lanes, subsequent relocation to other areas or shred removal from the site.

In the previous analysis (January 25th), the main shred pile was broken into four major segments with the initial fire lanes serving as the dividing point between segments. The segments were designated S-NW (northwest), S-NE (northeast), S-SE (southeast) and S-SW (southwest). With the subsequent creation of fire lane 2, the western portion of the northwest pile has designated S-3 in the calculation summary contained in Appendix B. An average depth was established for each of these segments based on observed changes as of April 29th.

Average density was also adjusted to reflect projected impact of subsequent compaction resulting from heavy equipment movement associated with additions or loosely packed perimeter additions. These densities reflect relatively clean shreds since it is difficult to accurately assess the degree of soil contamination within the piles. Dirt that is not removed from the shreds prior to disposal can significantly increase effective volumetric density and the total weight of material requiring disposal.

Based on these estimates, the quantity of shreds contained in the shred piles decreased by approximately 1,677 tons, indicating that a portion of the shreds removed from the fire lanes (or equivalent quantities from processing operations) had been added to remaining pile segments. The total estimated quantity of shreds contained in designated organized piles was 46,742 tons.

During 1993, Florida Tire spread shredded tires over most of the western portion of the site. As previously mentioned, measured shred depth approached 4 feet in some areas. In order to approximate the quantity of shreds spread over the site, the covered surface area was calculated based on aerial photographs and surface observations. An effective average depth of slightly less than 2 feet (0.6 yards) was used for estimation purposes based on measurements at selected locations. Density was estimated to be 40 pounds/cubic foot due to truck compaction and probable residual dirt contamination even after soil separation. The density will be significantly higher if soil is not separated prior to removal.

Between January 25, 1994 and April 29, 1994, there was no apparent indication that Florida Tire had significantly increased the quantity of shreds dispersed over the site. Shreds scraped from the southwest area and fire lane 4 remained in adjacent piles. The only net reduction in dispersed shreds was the quantity removed

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from fire lanes within the main shred pile area that had been cleared to ground level. Although portions of these shreds were apparently added to existing piles, the dispersed quantity was reduced by 1,263 tons to avoid double-counting. The resulting estimated quantity of shreds spread over the site was 17,826 tons as of April 29th, representing the equivalent of 1,782,600 passenger tires.

Table 1 provides a summary of estimated quantities of whole and shredded tires present at the site on April 29, 1994 compared to January 25, 1994. The estimated net quantity of whole and shredded tires decreased approximately 3,816 tons (381,600 PTE) during this period. Although reports provided by Florida Tire indicate a larger net reduction, the difference is within the accuracy limits of estimating techniques. Any real differences will become more apparent over longer periods of time.

TABLE 1
ESTIMATED QUANTITY COMPARISON SUMMARY

CLASSIFICATION	ESTIMATED QUANTITY (tons @ 100 PTE/ton)		
	1/25/94	4/29/94	DIFFERENCE
Whole Tires			
Off-Road/Mixed	3,553	2,729	- 824
Passenger/Truck	1,079	1,027	- 52
Subtotal	4,632	3,756	- 876
Shredded Tires			
Piles	48,419	46,742	- 1,677
Spread on Ground	19,090	17,827	- 1,263
Subtotal	67,509	64,569	- 2,940
TOTAL	72,141	68,325	- 3,816

COMPLIANCE WITH STIPULATION ORDER

The Stipulation Order between FDEP and Florida Tire contains detailed provisions intended to control the environmental and public health hazards associated with the site by achieving site stabilization and regulatory compliance within defined periods of time. The agreement contains provisions allowing time extensions based on delays associated with obtaining required permits, but T.A.G. is not involved in this process. Therefore, the following table summarizes status of compliance with the provisions of the Stipulation Order that T.A.G. was requested to examine (Section 10.D. - Site Stabilization) based on the stated times (representing the intended schedule).

COMPLIANCE WITH SITE STABILIZATION SECTION

Section	Activity	Compliance		Status (as of 4/29/94)
		Days	Date	
10.D.1	Clear 50' perimeter	30	Feb 12	Not completed - Shreds still within 50' along critical N/S boundary near railcars
10.D.2	Clear FL-1,2,3	60	Mar 14	Not completed - Only 40' wide
10.D.3	Clear FL-4 (50')	90	Apr 13	Completed
10.D.4	Lower height to 15' maximum Clear FL-5,6 Clear FL-7	160	Jun 22	Height increased since January FL-5,6 only 8-15' FL-7 not started
10.D.5	Remove all tires/shreds from FP&L easement	180	Jul 12	Not started
10.D.6	Reconfigure piles Remove excess	180	Jul 12	Not started

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In addition, the following table summarizes comments related to other provisions of the Stipulation Order based on information provided by Florida Tire or on-site observations during the April 29th visit:

COMPLIANCE WITH OTHER OBSERVABLE SECTIONS

Section	Activity	Compliance		Status (as of 4/29/94)
		Days	Date	
10.B.	Commence design/ construction of 24' perimeter and central access roadways	30	Feb 12	Construction begun, but no apparent progress since 1/25
10.C.2	b. Install gate at southern access	30	Feb 12	Wood barrier in place, not gate
	c. Install lights along Range Line Road perimeter	30	Feb 12	Installed, but intensity not observed (daytime)
10.C.4	Complete water supply/distrib- ution system	90	Apr 13	No apparent action
10.E.	Remove 100 tons (net) from site per operating day	15	Jan 28	Reports from F.T. show compliance for Feb. and March
10.F.	a. Provide add'l \$50,000 financial assurance	30	Feb 12	Completed
	b. Extend existing \$15,000 LC	30	Feb 12	In process of conversion

As outlined in the above tables, Florida Tire has failed to comply with the intended schedule contained in the Stipulation Order on activities that are critical to control of potential environmental and public health hazards associated with their site, including at least the following:

Perimeter Clearing - Failure to clear a perimeter path at least 50 feet wide along the property boundary with adjacent industrial property has allowed continuation of the probability of chemical railcar involvement if a fire occurs at the site. Rupture of these railcars from heat could release chlorine and caustic, endangering local residents, businesses and emergency response personnel.

Access Roadway Construction - Failure to complete construction of navigable perimeter and central access roadways prevents fire-fighting equipment from maximizing access and efficiency during a fire, limiting their ability to control the environmental and public health consequences.

Fire Lane Clearing - Failure to clear fire lanes 1, 2 and 3 to a minimum width of 50 feet (preferably to their recommended width of 100 feet) significantly increases the probability of a fire involving multiple pile segments, proportionately increasing environmental and public health consequences.

Water Supply - Apparent failure to implement provisions required to assure an adequate water supply could significantly impede emergency response efforts to control the magnitude of a possible fire.

When combined with other failures, Florida Tire has clearly not achieved reduction of hazards associated with their site in accordance with the intended schedule contained in the Stipulation Order. Unless their limited progress is specifically due to permitting requirements contained in the Stipulation Order (and Florida Tire has made all reasonable efforts to file and complete such permits in a timely manner), Florida Tire was not in compliance with important provisions of the Stipulation Order as of April 29, 1994. Based on their performance to date, it is unlikely that Florida Tire will achieve the defined site stabilization objectives within the intended time schedule.

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FLORIDA TIRE RECYCLING SITE

APPENDIX A

SITE SCHEMATIC

APPENDIX A - FLORIDA TIRE RECYCLING, INC. - SITE SCHEMATIC

KEY

- WHOLE TRUCK/PASSENGER TIRES
- WHOLE OVERSIZE TIRES
- SHREDDED TIRES
- LAYER OF SHREDS
- NEW SHRED PILE
- REMOVED PILES

PROPERTY LINE

DRAINAGE DITCH

UNSTABILIZED ROADWAY

WATER TANKS



SCALE

Approx. 100 feet

FIRE LANE 5

POWER LINES

MIAMI
TANK
FACILITY

Railroad Spur

Range Line Road

Fire Lane 1

Fire Lane 2

Fire Lane 3

FIRE LANE 6

EXISTING

STABILIZED

ROADWAY

OFFICE

POND

Fire Lane 4

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FLORIDA TIRE RECYCLING SITE

APPENDIX B

WASTE TIRE QUANTITY CALCULATION SUMMARY

FLORIDA TIRE RECYCLING INC
WASTE TIRE QUANTITY CALCULATION SUMMARY
(as of April 29, 1994)

Pile	Type		Dimensions (yards)					Density (PTE/ cu.yd.)	Quantity	
	Tire	Pile	L	W	Area	H	Volume		PTE	Tons
PASSENGER/TRUCK TIRES										
T-3	Truck	Stacked	40	35	1,400	2.33	3,262	18.0	58,716	587
T-7	Truck	Stacked	25	42	1,050	2.33	2,447	18.0	44,037	440
Subtotal - Passenger/Truck Tires									102,753	1,028
OFF-ROAD/MIXED TIRES										
T-10	OR/TR	Loose	Irregular	1,040	2	2,080	18.0	37,440	374	
T-11	OR/TR	Loose	Irregular	240	2	480	18.0	8,640	86	
T-15	Off-road	Loose	Irregular	2,400	4	9,600	18.0	172,800	1,728	
T-16	Off-road	Loose	Irregular	360	2.33	839	18.0	15,098	151	
T-18	OR/TR	Loose	Irregular	360	4	1,440	18.0	25,920	259	
T-20	OR/TR	Loose	Irregular	240	3	720	18.0	12,960	130	
Subtotal - Off-road/Mixed Tires									272,858	2,729
TOTAL WHOLE TIRES									375,611	3,756

APPENDIX B (continued)

FLORIDA TIRE RECYCLING INC
WASTE TIRE QUANTITY CALCULATION SUMMARY

SHREDDED TIRE PILES

Pile	Dimensions (yards)			Estimated Density		Estimated Quantity	
	Area	Height	Volume	lbs/ cu ft	lbs/ cu yd	PTE	Tons
S-1	1,200	4.0	4,800	30	810	194,400	1,944
S-2	3,480	6.5	22,620	32	864	977,184	9,772
S-3	1,380	7.0	9,660	33	891	430,353	4,304
S-NW	3,620	6.0	21,720	33	891	967,626	9,676
S-NE	1,920	5.0	9,600	32	864	414,720	4,147
S-SE	1,200	8.0	9,600	40	1,080	518,400	5,184
S-SW	3,100	7.0	21,700	38	1,026	1,113,210	11,132
S-10	480	3.0	1,440	30	810	58,320	583
Subtotal						4,674,213	46,742
S-GR	55,020	0.6	33,012	40	1,080	1,782,648	17,826
TOTAL SHREDS						6,456,861	64,569
WHOLE TIRES (from previous page)						375,611	3,756
TOTAL ESTIMATED ON-SITE QUANTITY (4/29/94)						6,832,472	68,325