T.A.G.
RESOURCE RECOVERY

Confidential

FAX COVER PAGE

Date: 4/8/94

From: Terry Gray
TAG Resource Recovery
(713) 463-7552

Joe,
I HAVE NO COMMENTS.
-JK

To: ~~Bill Parker / Jon Clark~~
cc: Joe Lorix

Pages (including cover page): _____

Message: Attached is the much-delayed site condition report for Florida Tile. Please review and comment. Bill, will you please make a copy for Trent Bowmer so that I don't have to fax it twice to your building. Thanks.

Terry

16035 RADWORTHY DRIVE * SUITE 110 * HOUSTON, TX 77084 PHONE: (713) 463-7552

DRAFT

4/4/94

FLORIDA TIRE RECYCLING, INC WASTE TIRE SITE:

SITE CONDITIONS AS OF JANUARY 25, 1994

Prepared for

The Florida Department of Environmental Protection

by

Terry A. Gray and Andrew E. Ronchak,

TAG Resource Recovery

April, 1994

THIS IS AN ENFORCEMENT DOCUMENT SPECIFICALLY REQUESTED BY JANET BOWMAN, ESQ. AND IS CONSIDERED A CONFIDENTIAL DOCUMENT IN ENFORCEMENT PROCEEDINGS UNLESS RELEASED BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Florida Tire Recycling Site
Site Condition - 1/25/94
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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 legal agreement 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. However, the site has remained active, resulting in significant change since it was last examined on March 11, 1993. Therefore, the objective of this visit on January 25, 1994 was to document current site conditions in order to provide a baseline for monitoring implementation of the court agreement.

SITE CONDITIONS

A schematic representation of site conditions as of January 25, 1994 is provided in Appendix A. The schematic illustrates the following changes in site conditions between March 11, 1993 and January 25, 1994:

Removal/Relocation of Piles Containing Whole Tires

Florida Tire has been removing, processing and/or relocating 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.

The following whole tire piles have been removed: T-1, T-2, T-4, T-5, T-6, T-8, T-9, part of T-10, part of T-11, T-12, T-13, part of T-14, T-17, part of T-18 and T-19. Approximately 60,000 passenger tires were reportedly shipped to Rinker's cement kiln for use as a supplemental fuel during environmental trials. The remainder of the passenger and truck tires have been shredded. Resulting shreds have apparently been transported to landfills for disposal, added to existing shred piles or spread across western portions of the property, including areas previously containing whole tire piles.

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Off-road tires have apparently been relocated on-site. Florida Tire indicated during our visit that their equipment cannot process large off-road tires and that they had not yet hired a contractor with specialized machinery capable of handling these tires. It appears that off-road tires have been added to pile T-15, consolidated in piles T-10 and T-11, or placed in new piles T-20, T-21 and T-22.

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 as depicted in the site schematic. These fire lanes are only 8 to 10 feet wide with sharp vertical walls, representing a path generated by one pass of their large loader through the pile.

The fire lanes had not been broadened since their initial creation in 1993. Shreds were not removed down to ground level within these fire lanes. As a result of their narrow width and remaining ground-level shreds, these fire lanes represent virtually no impediment to transmission of fire between adjacent pile segments.

Shred Pile Additions

Based on comparison of on-site observations on March 11, 1993 and January 25, 1994 and aerial photographs taken at various times during 1993, shreds appear to have been added to the upper elevations of remaining pile segments. Presence of newly-created ramps indicate access by heavy equipment such as trucks used to carry shreds. In earlier photographs, the pile surfaces were a uniform dark color. However, after creation of the fire lanes, shred mounds resembling dump truck loads appeared on portions of the pile surfaces. These shred mounds had a brownish color, indicating recent deposition of dirt-contaminated shreds from the fire lanes. Some shred pile dimensions and contours also changed. For instance, a space between the foot of shred piles S-6/S-7 and S-10 had been partially filled with shreds. There are indications that newly processed shreds were also added to existing shred piles.

Shred Dispersion

Based on comparative photographs and on-site observations, shreds were also dispersed across most of the western part of the site between March 11, 1993 and January 25, 1994. Shred depth ranged from 1 to 4 feet depending on the location. Photo

documentation at the northern edge of piles T-3 and T-5 (where ground level was still exposed) indicated adjacent shred depth approaching 4 feet as of January 25th.

Areas previously containing whole tire piles were also 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. The average effective shred depth across the western portion of the site was estimated to be 2 feet. Shreds in areas traveled by heavy equipment had been compacted, becoming mixed with underlying soil. Shreds spread over this large area represent a significant cumulative volume as discussed in subsequent estimates of on-site quantities. In effect, shreds removed from fire lanes and from processing of whole tires (from piles and on-going generation) have been dumped across the property.

Florida Tire's dispersion of a thick layer of shreds over most of the property has significantly increased the potential environmental and public health hazard associated with the site due to two primary factors. 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 surrounding 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 access the environmental impact of waste tire shred use in civil engineering applications. Copies of reports covering leaching characteristics were provided to Florida Tire through Mr. Joe Kahn of DEP in the spirit of cooperation. The general conclusion is that potentially toxic inorganic and organic compounds can be leached from shreds depending on pH exposure conditions. Since pH conditions are site specific and can be seasonally dependent, 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 shreds are not exposed to possible 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 1½-2

Florida Tire constructed drainage ditches along the southern and western perimeter. 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 4-6 feet deep. This ditch impedes vehicle or pedestrian access to the site from the roadway, including blocking access to the western perimeter. As a result, fire control vehicles entering the southern access roadway have no forward exit, a dangerous condition under adverse fire conditions. A narrow sand plug had been installed at the eastern property boundary.

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 two points. A drainage channel that previously existed along

the property boundary with Miami Tank had been 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 chemical rail car involvement if a fire occurs.

Perimeter Road Construction

Florida Tire initiated construction of a perimeter roadway along the southern property boundary. As of January 25, 1994, the roadway consisted of a raised sand base 25-30 feet wide. Although the roadway had been leveled and compacted, the ability of the surface to support fully-loaded fire fighting equipment appeared to be questionable. As previously noted, the southern drainage ditch blocked vehicle access to site, including the western perimeter.

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. However, it was clearly impassable for heavy fire trucks. Since the effective range of fire-fighting equipment is limited, prompt completion of continuous perimeter and central access roadways represents a critical factor in implementation of an effective fire control plan.

Perimeter Fencing And Lighting

The southern and western site perimeter were enclosed by a 4-strand barbed wire fence. The southern fence 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 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 front property boundary bordering Range Line Road had not been fenced as of January 25, 1994. The southern perimeter roadway entrance from Range Line Road was partially blocked by a wooden fence that was not gated to allow access by fire-fighting equipment.

As of January 25, 1994, no additional perimeter lighting had been installed, even along Range Line Road as required under the agreement.

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ESTIMATED QUANTITY

T.A.G. Resource Recovery (TAG) estimated that the site contained approximately 5,734,000 passenger tire equivalents (PTE) as of March 11, 1993. Since the site has remained active, a revised quantity estimate was prepared based on surface observations and aerial photographs taken on January 25, 1994.

Pile Characteristics and Quantities

Whole tire piles were estimated to contain a total of 849,000 passenger tire equivalents (PTE) as of March 11, 1993. A summary of waste tire quantity calculations reflecting site conditions as of January 25, 1994 is provided in Appendix B.

Passenger and truck tires contained in piles T-2, T-4, T-5, T-6, T-8, portions of T-10, and T-17 on March 11, 1993 had been removed, moved or processed as of January 25, 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 contained a total of approximately 102,800 PTE as of January 25th. In addition, rimmed passenger and truck tires had been accumulated in a new pile designated T-22 containing an estimated 5,100 PTE. A density of 8 PTE/cubic yard was used for this pile recognizing less compaction by rimmed tires. Total whole passenger and truck tires in these three piles were estimated to represent 107,900 PTE.

Off-road tires contained in piles T-1, T-9, T-12, T-13, and T-19 had been moved between March 23, 1993 and January 25, 1994, apparently in an effort to clear areas through consolidation. Off-road tires or mixtures of off-road/large truck tires remained in piles T-10, T-11, T-14, T-15, T-16 and T-18. Many of these tires had been added to expanded piles T-15, T-16 and T-18. In addition, two new piles designated T-20 and T-21 contained mixtures of large truck and off-road tires.

These off-road tire piles were irregularly shaped, occupying surface areas of 240 - 1,920 square yards each. Average effective pile heights ranged from 7 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 355,300 PTE as of January 25, 1994. The total quantity of whole tires was estimated to be 463,200 PTE.

The total quantity of shredded tires on the site as of March 11, 1993 was estimated to be 4,850,000 passenger tire equivalents representing 48,500 tons. Based on site observations on January 25, 1994, site conditions had changed as a result of continuing receipt, shredding and storage operations. Therefore, a thorough reevaluation of shred quantities was conducted based on aerial photographs and surface measurements taken on January 25th, using the same techniques described fully in previous documents.

The top contour of the main shred pile had changed significantly, reflecting additions to the top of the pile as previously referenced. As a result, this pile was broken into four major segments with the initial fire lanes serving as the dividing point between segments. The segments have been designated S-NW (northwest), S-NE (northeast), S-SE (southeast) and S-SW (southwest) in the calculation summary contained in Appendix B. An average depth was established for each of these segments based on measurements.

An average density was also estimated based on previous analysis and projected impact of subsequent compaction resulting from heavy equipment movement associated with 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 main shred pile remained virtually the same, indicating that shreds removed from the fire lanes (or equivalent quantities from processing operations) had been added to the top of the remaining pile segments. The total estimated quantity of shreds contained in designated organized piles was 48,419 tons, within 1% (431 tons) of the estimated quantity on March 11, 1993.

During 1993, Florida Tire spread shredded tires over most of the western portion of the site. As previously mentioned, measured shred depth approaches 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. The resulting estimated quantity of shreds spread over the site is 19,090 tons, representing the equivalent of 1,909,000 passenger tires.

Table 1 provides a summary of estimated quantities of whole and shredded tires present at the site on January 25, 1994 compared to March 11, 1993. Although Florida Tire's processing of whole tire piles has reduced whole tire quantity by 3,858 tons, this decrease is more than counterbalanced by the addition of 18,659 tons of shredded tires. As a result, the net quantity of whole and shredded tires increased 14,810 tons (1,481,000 PTE) during this period. It appears that processed tires from on-site piles and on-going generation have been added to the on-site inventory by being spread over the western portion of the property.

TABLE 1
ESTIMATED QUANTITY COMPARISON SUMMARY

CLASSIFICATION	ESTIMATED QUANTITY (tons @ 100 PTE/ton)		
	3/11/93	1/25/94	DIFFERENCE
Whole Tires			
Off-Road	2,940	3,553	+ 613
Passenger/Truck	5,550	1,079	- 4,471
Subtotal	8,490	4,632	- 3,858
Shredded Tires			
Piles	48,850	48,419	- 431
Spread on Ground	-	19,090	+19,090
Subtotal	48,850	67,509	+18,659
TOTAL	57,340	72,141	+14,801

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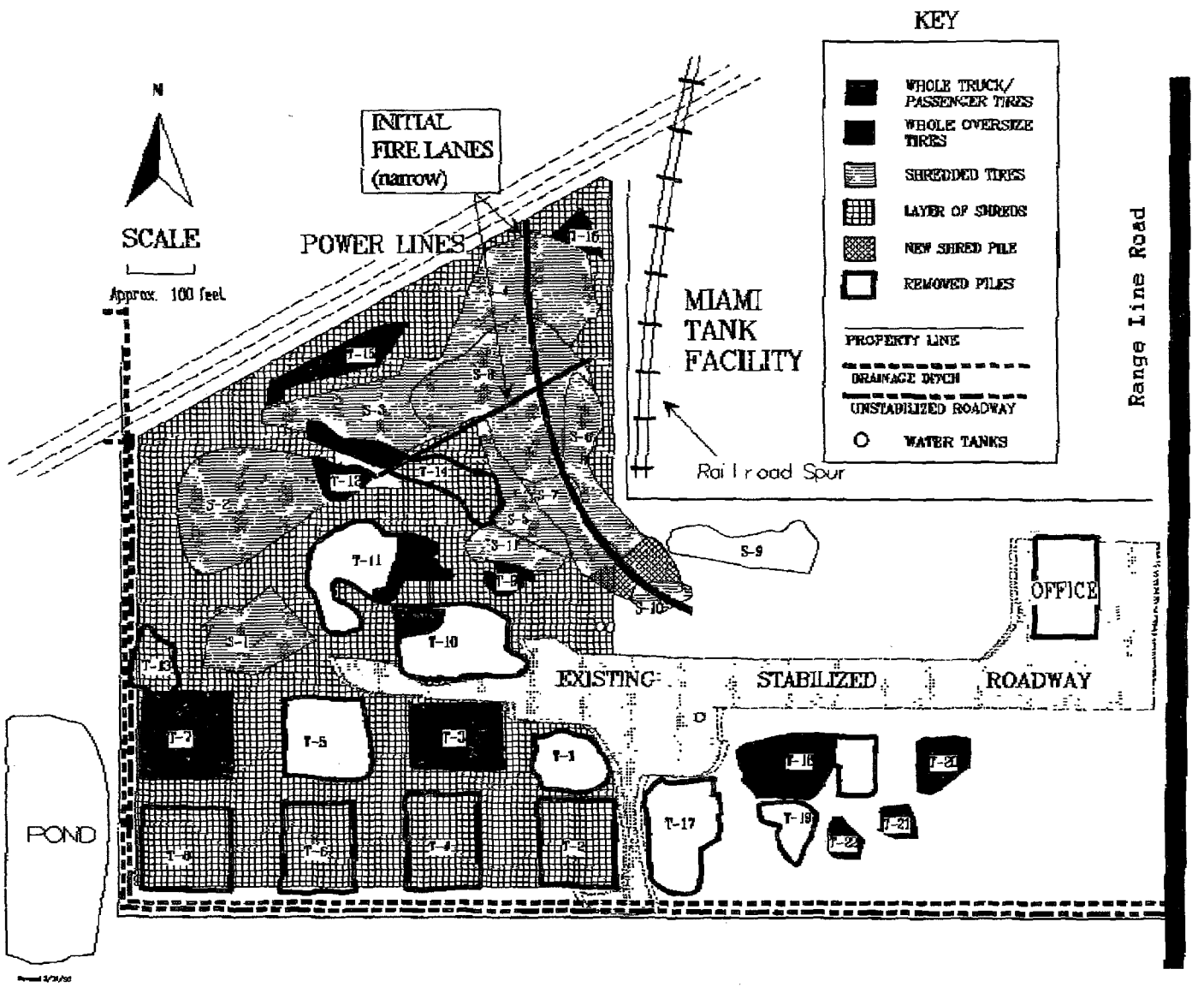
FLORIDA TIRE RECYCLING SITE

APPENDIX A

SITE SCHEMATIC

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



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FLORIDA TIRE RECYCLING SITE

APPENDIX B

WASTE TIRE QUANTITY CALCULATION SUMMARY

Florida Tire Recycling Site
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APPENDIX B

FLORIDA TIRE RECYCLING INC

WASTE TIRE QUANTITY CALCULATION SUMMARY

Whole Tire Piles

Pile #	Dimensions (yards)					Tire Type	Pile Type	Density PTE/cy	Est Quant (PTE)
	L	W	Area	H	Volume				
PASSENGER/TRUCK TIRES									
T-3	40	35	1,400	2.33	3,265	Truck	Stack	18	58,800
T-7	25	42	1,050	2.33	2,445	Truck	Stack	18	44,000
T-22	Irreg.		240	2.67	640	R/Pass	Loose	8	5,100
	Subtotal - Passenger/Truck							107,900	
OFF-ROAD/MIXED TIRES									
T-10	Irreg.		960	3	2,880	OR/TR	Loose	18	51,800
T-11	Irreg.		300	3	900	OR/TR	Loose	18	16,200
T-14	Irreg.		240	3	720	OR/TR	Loose	18	13,000
T-15	Irreg.		1,920	4	7,680	OR	Loose	18	138,200
T-16	Irreg.		360	2.33	840	OR	Loose	18	15,100
T-18	Irreg.		1,080	4	4,320	OR/TR	Loose	18	77,800
T-20	Irreg.		240	4	960	OR/TR	Loose	18	17,300
T-21	Irreg.		360	4	1,440	OR/TR	Loose	18	25,900
	Subtotal - Off-Road/Mixed							355,300	
	TOTAL WHOLE TIRES							463,200	

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APPENDIX B (continued)

FLORIDA TIRE RECYCLING INC

WASTE TIRE QUANTITY CALCULATION SUMMARY

Shredded Tire Piles

Pile Number	Dimensions (yards)			Est Density		Est Quantity	
	Area	Height	Volume	lbs/ cuft	lbs/ cuyd	Tons	PTE
S-1	840	2.3	1,930	30	810	780	78,000
S-2	3,840	6	23,040	32	864	9,950	995,000
S-NW	5,640	6	33,840	33	891	15,075	1,507,500
S-NE	1,920	5	9,600	32	864	4,147	414,700
S-SE	1,800	8	14,400	40	1080	7,775	777,500
S-SW	2,520	7	17,640	40	1080	9,526	952,600
S-10	720	4	2,880	30	810	1,166	116,600
Subtotal			103,330			48,419	4,841,900
S-GR	58,920	0.6	35,350	40	1080	19,090	1,909,000
TOTAL SHREDS			138,680			67,509	6,750,900
ESTIMATED WHOLE TIRES (PTE)						4,632	463,200
TOTAL ESTIMATED ON-SITE QUANTITY (1/25/94)						72,141	7,214,100