

**Field Investigation: Evaluation of Non-Destructive Density Testing
Devices on Hot Mix Asphalt**

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Introduction

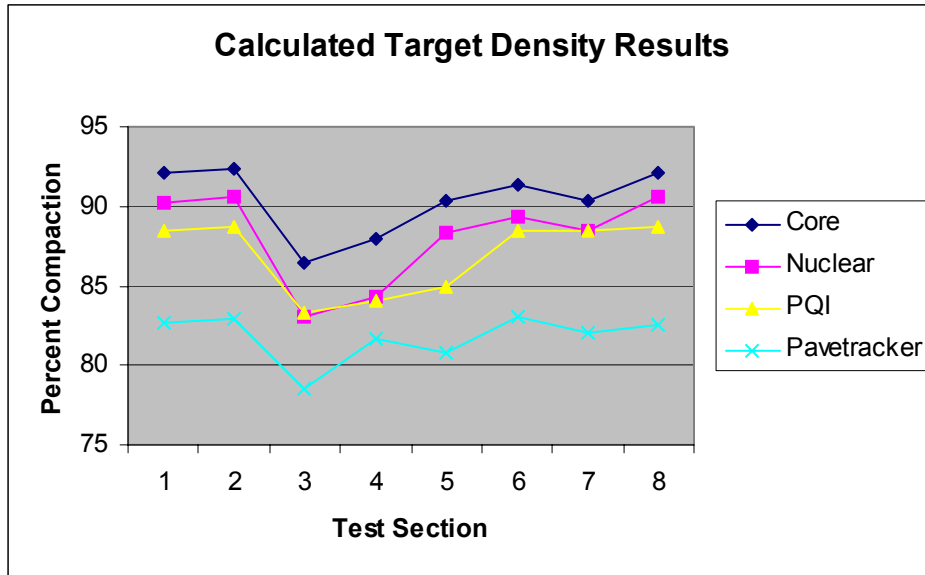
With recent advances in technology used to compact Hot Mix Asphalt (HMA), a testing program was developed to demonstrate and evaluate several different types of asphalt rollers. In order to facilitate this showcase a local contractor agreed to participate on two different projects. One project was NC-117 near Goldsboro and the other was I-95 near Wilson. As shown in Appendix A extensive testing was conducted in each 100-foot test section. Due to the amount of testing being performed we felt this provided an excellent opportunity to evaluate several different non-destructive devices used to test asphalt pavement density. The testing devices evaluated are as follows: Pavement Quality Indicator (PQI) manufactured by Transtech, Pavetracker manufactured by Troxler and a Troxler 4640-B nuclear density gauge. With increasing rules and regulations regarding nuclear gauges, both the PQI and Pavetracker devices were of particular interest since neither one contains any radioactive sources.

Procedures

Currently, the Department uses either core results or nuclear gauge readings for density acceptance on HMA. Though a core provides the most accurate measurement of in-place density, cutting cores out of a new layer of asphalt is not a desirable method of acceptance testing. However, non-destructive testing devices may not provide accurate results due to influences from underlying material, and the fact that the majority of the influence on a density reading comes from the top inch of material. Based on our experience and observations non-destructive devices generally show a lower density reading than indicated by the cores. One possible factor causing lower density readings is that Superpave mixes are generally coarser than the Marshall mixes resulting in more surface voids. The following table lists the average density results for each test section based on the specific gravity of the mix. The graph following table 1 provides a graphical representation of the density results. For each test section the average of six cores was compared to the average of the total number of readings taken with each testing device. The data clearly demonstrates a pattern for each of the non-destructive testing devices when compared to the cores.

Calculated Target Density Results (test section average %)					
Date	Mix	Core	Nuclear	PQI	Pavetracker
8/9/2005	S 12.5 D	92.1	90.2	88.5	82.7
8/10/2005	S 12.5 D	92.3	90.6	88.7	82.9
8/23/2005	RS-9.5 C	86.4	83.1	83.3	78.5
8/23/2005	RS-9.5 C	87.9	84.3	84.1	81.7
8/25/2005	RS-9.5 C	90.3	88.3	85.0	80.8
10/5/2005	S 12.5 D	91.3	89.4	88.4	83.1
10/18/2005	S 12.5 D	90.4	88.5	88.4	82.0
10/18/2005	S 12.5 D	92.1	90.6	88.7	82.5

Table 1

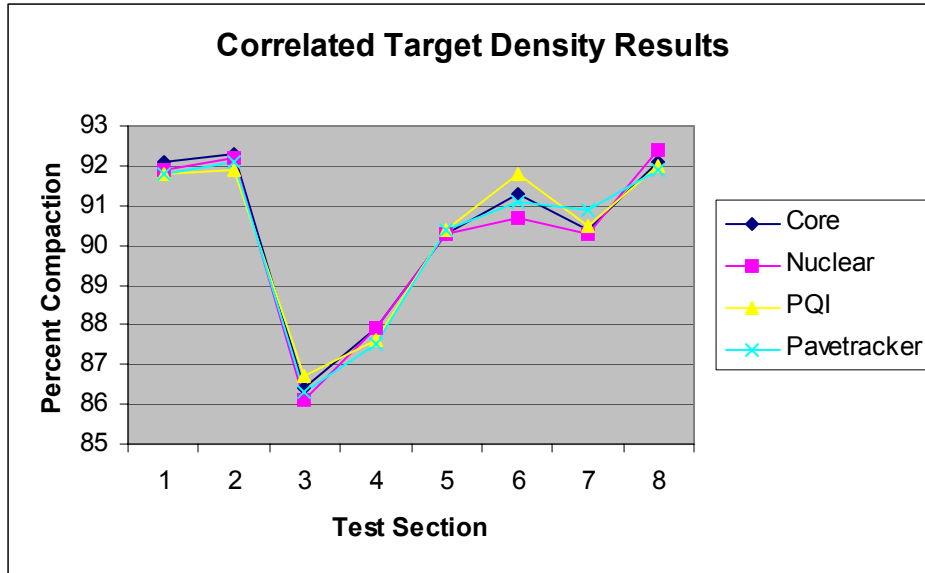


Graph 1

In order to compensate for these influences our current specifications require the establishment of a correlated target density by completing a Control Strip. Our procedures for determining a Correlated Target Density is as follows: calculate the average percent compaction of the cores and the average lbs/cu.ft. for each gauge reading taken at each core site. The Target Density is then calculated by dividing the average of the gauge readings by the average of the cores and multiplying by 100. For this demonstration a correlated target was established for each test section and all percent compaction results were re-calculated to determine the results based on the correlated target. The results are shown in table 2 and graph 2. As shown the non-destructive gauge results from the correlated data provide a much better relationship to actual core density.

Correlated Target Density Results (test section average %)					
Date	Mix	Core	Nuclear	PQI	Pavetracker
8/9/2005	S 12.5 D	92.1	91.9	91.8	91.8
8/10/2005	S 12.5 D	92.3	92.2	91.9	92.1
8/23/2005	RS-9.5 C	86.4	86.1	86.7	86.3
8/23/2005	RS-9.5 C	87.9	87.9	87.6	87.5
8/25/2005	RS-9.5 C	90.3	90.3	90.4	90.4
10/5/2005	S 12.5 D	91.3	90.7	91.8	91.1
10/18/2005	S 12.5 D	90.4	90.3	90.5	90.9
10/18/2005	S 12.5 D	92.1	92.4	92.0	91.9

Table 2



Graph 2

A Correlated Target Density compensates for irregularities that may influence any of the three non-destructive testing devices; however, when using a Control Strip to establish a Target Density careful consideration must be given in writing specifications regarding frequency, location, and procedures. Issues such as changes in the underlying material, alterations of the asphalt mix design, or even using a different non-destructive testing device will effect the Target Density.

Test Results

The following pages contain results for each test section conducted during the compactor showcase. The calculated density results are shown first followed by the correlated results.

8/9/2005	Wilson Co	36691.3.1	I-95	S 12.5 D				
	Calculated Target = 153.5			Gravity = 2.460				
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
850+75 (0.5')			128.5	83.7	131.2	85.5	121.4	79.1
850+75 (2.7')	136.9	89.2	140.4	91.5	136.9	89.2	127.9	83.3
850+75 (4.9')			143.1	93.2	138.4	90.2	128.7	83.8
850+75 (7.1')			140.3	91.4	136.5	88.2	127.1	82.8
850+75 (9.3')			141.6	92.2	137.1	89.3	127.4	83.0
850+72 (11.5')			134.6	87.7	133.7	87.1	125.0	81.4
Average				90.0		88.3		82.2
851+00 (0.5')			131.2	85.5	131.3	85.5	122.4	79.7
851+00 (2.7')			140.3	91.4	136.4	88.9	127.4	83.0
851+00 (4.9')	142.2	92.6	143.1	93.2	138.5	90.2	128.8	83.9
851+00 (7.1')			140.6	91.6	136.4	88.9	126.7	82.5
851+00 (9.3')			142.0	92.5	137.4	89.5	128.0	83.4
851+00 (11.5')			133.3	86.8	133.0	86.6	124.4	81.0
Average				90.2		88.3		82.3
851+25 (0.5')			132.7	86.4	132.1	86.1	123.0	80.1
851+25 (2.7')			142.2	92.6	137.4	89.5	128.7	83.8
851+25 (4.9')			145.7	94.9	139.7	91.0	129.7	84.5
851+25 (7.1')	144.2	93.9	139.9	91.1	136.7	89.1	127.3	82.9
851+25 (9.3')			141.2	92.0	136.8	89.1	127.6	83.1
851+25 (11.5')			133.1	86.7	133.1	86.7	124.0	80.8
Average				90.6		88.6		82.5
851+50 (0.5')			135.3	88.1	133.6	87.0	125.1	81.4
851+50 (2.7')			141.2	92.0	137.2	89.4	128.2	83.5
851+50 (4.9')			143.2	93.3	139.2	90.7	130.3	84.9
851+50 (7.1')			137.4	89.5	134.8	87.8	124.6	81.7
851+50 (9.3')	141.8	92.4	141.7	92.3	137.3	89.4	128.5	83.7
851+50 (11.5')			136.9	89.2	135.1	88.0	127.8	83.3
Average				90.7		88.7		83.1
851+75 (0.5')	142.8	93.0	130.9	85.3	133.0	86.6	125.8	82.0
851+75 (2.7')			135.0	87.9	136.4	88.9	128.9	83.0
851+75 (4.9')			142.8	93.0	139.0	90.6	131.1	85.4
851+75 (7.1')			137.3	89.4	135.2	88.1	127.3	82.9
851+75 (9.3')			140.3	91.4	136.8	89.1	129.5	84.4
851+75 (11.5')	140.2	91.3	136.9	89.2	135.0	87.9	126.0	82.1
Average				89.4		88.5		83.3
Average		92.1		90.2		88.5		82.7

8/9/2005	Wilson Co	36691.3.1	I-95	S 12.5 D				
	Correlated Target:		150.7 pcf		147.9 pcf		138.3 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
850+75 (0.5')			128.5	85.3	131.2	88.7	121.4	87.8
850+75 (2.7')	136.9	89.2	140.4	93.2	136.9	92.6	127.9	92.5
850+75 (4.9')			143.1	95.0	138.4	93.6	128.7	93.1
850+75 (7.1')			140.3	93.1	136.5	92.3	127.1	91.9
850+75 (9.3')			141.6	94.0	137.1	92.7	127.4	92.1
850+72 (11.5')			134.6	89.3	133.7	90.4	125.0	90.4
Average				91.7		91.7		91.3
851+00 (0.5')			131.2	87.1	131.3	88.8	122.4	88.5
851+00 (2.7')			140.3	93.1	136.4	92.2	127.4	92.1
851+00 (4.9')	142.2	92.6	143.1	95.0	138.5	93.6	128.8	93.1
851+00 (7.1')			140.6	93.3	136.4	92.2	126.7	91.6
851+00 (9.3')			142.0	94.2	137.4	92.9	128.0	92.6
851+00 (11.5')			133.3	88.4	133.0	89.9	124.4	89.9
Average				91.9		91.6		91.3
851+25 (0.5')			132.7	88.1	132.1	89.3	123.0	88.9
851+25 (2.7')			142.2	94.4	137.4	92.9	128.7	93.1
851+25 (4.9')			145.7	96.7	139.7	94.4	129.7	93.8
851+25 (7.1')	144.2	93.9	139.9	92.8	136.7	92.4	127.3	92.0
851+25 (9.3')			141.2	93.7	136.8	92.5	127.6	92.3
851+25 (11.5')			133.1	88.3	133.1	90.0	124.0	89.7
Average				92.3		91.9		91.6
851+50 (0.5')			135.3	89.8	133.6	90.3	125.1	90.5
851+50 (2.7')			141.2	93.7	137.2	92.8	128.2	92.7
851+50 (4.9')			143.2	95.0	139.2	94.1	130.3	94.2
851+50 (7.1')			137.4	91.2	134.8	91.1	124.6	90.1
851+50 (9.3')	141.8	92.4	141.7	94.0	137.3	92.8	128.5	92.9
851+50 (11.5')			136.9	90.8	135.1	91.3	127.8	92.4
Average				92.4		92.1		92.1
851+75 (0.5')	142.8	93.0	130.9	86.9	133.0	89.9	125.8	91.0
851+75 (2.7')			135.0	89.6	136.4	92.2	128.9	93.2
851+75 (4.9')			142.8	94.8	139.0	94.0	131.1	94.8
851+75 (7.1')			137.3	91.1	135.2	91.4	127.3	92.0
851+75 (9.3')			140.3	93.1	136.8	92.5	129.5	93.6
851+75 (11.5')	140.2	91.3	136.9	90.8	135.0	91.3	126.0	91.1
Average				91.1		91.9		92.6
Average		92.1		91.9		91.8		91.8

8/10/2005	Wilson Co	36691.3.1	I-95	S 12.5 D				
	Calculated Target = 153.5			Gravity = 2.460				
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
915+40 (0.5')			132.4	86.3	133.9	87.2	122.8	80.0
915+40 (2.7')	147.9	93.7	141.9	92.4	139.3	90.8	129.1	84.1
915+40 (4.9')			143.6	93.6	140.2	91.3	128.9	84.0
915+40 (7.1')			138.1	90.0	134.8	87.9	126.8	82.6
915+40 (9.3')			143.8	93.7	138.4	90.3	128.5	83.7
915+40 (11.5')			135.5	88.3	134.0	87.4	123.9	80.7
Average				90.7		89.2		82.5
915+65 (0.5')			135.9	88.5	134.4	87.4	124.2	80.9
915+65 (2.7')			139.9	91.1	138.0	90.3	128.3	83.6
915+65 (4.9')	144.1	93.9	141.9	92.4	139.2	90.5	129.7	84.5
915+65 (7.1')			140.0	91.2	137.2	89.4	127.9	83.4
915+65 (9.3')			143.1	93.2	138.5	90.2	129.4	84.3
915+65 (11.5')			133.7	87.1	132.9	86.6	124.2	80.9
Average				90.6		89.1		82.9
915+90 (0.5')			134.6	87.7	134.3	87.2	124.0	80.8
915+90 (2.7')			142.2	92.6	137.7	89.7	128.6	83.7
915+90 (4.9')			143.3	93.4	137.1	89.4	129.4	84.3
915+90 (7.1')	143.9	93.7	136.0	88.6	132.3	86.6	123.4	80.6
915+90 (9.3')			142.9	93.1	137.2	89.4	128.9	83.9
915+90 (11.5')			136.6	89.0	133.8	87.3	125.2	81.5
Average				90.7		88.3		82.5
916+15 (0.5')			133.7	87.1	133.2	86.8	124.6	81.2
916+15 (2.7')			140.0	91.2	137.5	89.6	129.4	84.8
916+15 (4.9')			139.9	91.1	138.5	90.2	129.6	84.4
916+15 (7.1')			138.7	90.4	135.4	88.6	128.0	83.4
916+15 (9.3')	144.3	94.0	142.7	93.0	137.5	89.6	130.3	84.9
916+15 (11.5')			133.5	87.0	132.3	86.2	125.2	81.5
Average				90.0		88.5		83.4
916+40 (0.5')	138.5	90.2	134.3	87.5	133.7	87.2	125.5	81.8
916+40 (2.7')			142.9	93.1	137.7	89.7	128.9	83.9
916+40 (4.9')			142.8	93.0	138.2	90.0	130.3	84.9
916+40 (7.1')			142.7	93.0	137.4	89.6	129.4	84.3
916+40 (9.3')			140.0	91.2	136.2	88.6	128.7	83.8
916+40 (11.5')	135.7	88.4	133.8	87.2	127.6	84.6	125.0	81.4
Average				90.8		88.3		83.4
Average		92.3		90.6		88.7		82.9

8/10/2005	Wilson Co	36691.3.1	I-95	S 12.5 D				
	Correlated Target:		150.7 pcf		147.9 pcf		138.3 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
915+40 (0.5')			132.4	87.9	133.9	90.5	122.8	88.8
915+40 (2.7')	147.9	93.7	141.9	94.2	139.3	94.2	129.1	93.3
915+40 (4.9')			143.6	95.3	140.2	94.8	128.9	93.2
915+40 (7.1')			138.1	91.6	134.8	91.1	126.8	91.7
915+40 (9.3')			143.8	95.4	138.4	93.6	128.5	92.9
915+40 (11.5')			135.5	89.9	134.0	90.6	123.9	89.6
Average				92.4		92.5		91.6
915+65 (0.5')			135.9	90.2	134.4	90.9	124.2	89.8
915+65 (2.7')			139.9	92.8	138.0	93.3	128.3	92.8
915+65 (4.9')	144.1	93.9	141.9	94.2	139.2	94.1	129.7	93.8
915+65 (7.1')			140.0	92.9	137.2	92.7	127.9	92.5
915+65 (9.3')			143.1	95.0	138.5	93.6	129.4	93.6
915+65 (11.5')			133.7	88.7	132.9	89.9	124.2	89.8
Average				92.3		92.4		92.1
915+90 (0.5')			134.6	89.3	134.3	90.8	124.0	89.7
915+90 (2.7')			142.2	94.4	137.7	93.1	128.6	93.0
915+90 (4.9')			143.3	95.1	137.1	92.7	129.4	93.6
915+90 (7.1')	143.9	93.7	136.0	90.2	132.3	89.5	123.4	89.2
915+90 (9.3')			142.9	94.8	137.2	92.8	128.9	93.2
915+90 (11.5')			136.6	90.6	133.8	90.5	125.2	90.5
Average				92.4		91.6		92.0
916+15 (0.5')			133.7	88.7	133.2	90.1	124.6	90.1
916+15 (2.7')			140.0	92.9	137.5	93.0	129.4	93.6
916+15 (4.9')			139.9	92.8	138.5	93.6	129.6	93.7
916+15 (7.1')			138.7	92.0	135.4	91.5	128.0	92.6
916+15 (9.3')	144.3	94.0	142.7	94.7	137.5	93.0	130.3	94.2
916+15 (11.5')			133.5	88.6	132.3	89.4	125.2	90.5
Average				91.6		91.8		92.5
916+40 (0.5')	138.5	90.2	134.3	89.1	133.7	90.4	125.5	90.7
916+40 (2.7')			142.9	94.8	137.7	93.1	128.9	93.2
916+40 (4.9')			142.8	94.8	138.2	93.4	130.3	94.2
916+40 (7.1')			142.7	94.7	137.4	92.9	129.4	93.6
916+40 (9.3')			140.0	92.9	136.2	92.1	128.7	93.1
916+40 (11.5')	135.7	88.4	133.8	88.8	127.6	86.3	125.0	90.4
Average				92.5		91.4		92.5
Average		92.3		92.2		91.9		92.1

8/23/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller			
Calculated Target = 156.2			Gravity = 2.504					
Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker		
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
141+51 (0.5')			127.4	81.6	129.0	82.6	124.1	79.4
141+51 (3.5')	140.3	89.8	136.4	87.3	134.7	86.2	130.3	83.4
141+51 (6.5')			134.4	86.0	131.8	84.4	127.7	81.8
141+51 (9.5')			132.7	85.0	132.6	84.9	128.0	81.9
141+51 (12.5')			129.7	83.0	131.3	84.1	126.0	80.7
141+51 (15.5')			120.6	77.2	127.7	81.8	122.8	78.6
Average				83.4		84.0		81.0
141+59 (0.5')			128.1	82.0	129.8	83.1	126.2	80.8
141+59 (3.5')			135.7	86.9	133.3	85.3	129.9	83.2
141+59 (6.5')	139.4	89.2	135.1	86.5	133.3	85.3	129.7	86.5
141+59 (9.5')			130.5	83.5	131.2	84.0	127.2	81.4
141+59 (12.5')			130.6	83.6	131.1	83.9	126.7	81.1
141+59 (15.5')			125.4	80.3	128.0	81.9	123.4	79.0
Average				83.8		83.9		82.0
141+67 (0.5')			128.5	82.3	129.8	83.1	126.7	81.1
141+67 (3.5')			135.7	86.9	133.7	85.6	130.5	83.5
141+67 (6.5')			133.3	85.3	132.4	84.8	129.6	83.0
141+67 (9.5')	137.3	87.9	133.0	85.1	132.1	84.6	129.3	82.8
141+67 (12.5')			132.8	85.0	130.6	83.6	126.8	81.2
141+67 (15.5')			122.6	78.5	127.9	81.9	122.7	78.6
Average				83.9		83.9		81.7
141+75 (0.5')			128.2	82.1	128.8	82.5	125.5	80.3
141+75 (3.5')			138.9	88.9	134.3	86.0	130.5	83.5
141+75 (6.5')			134.8	86.3	132.2	84.6	128.8	82.5
141+75 (9.5')			136.9	87.6	133.1	85.2	129.9	83.2
141+75 (12.5')	141.6	90.7	138.4	88.6	134.6	86.2	130.0	83.2
141+75 (15.5')			121.0	77.5	126.7	81.1	120.7	77.3
Average				85.2		84.3		81.7
141+38 (0.5')	135.3	86.6	129.2	82.7	129.5	82.9	126.1	80.7
141+38 (3.5')			138.4	88.6	133.8	85.7	129.9	83.2
141+38 (6.5')			134.4	86.0	132.0	84.5	128.8	82.5
141+38 (9.5')			137.3	87.9	133.5	85.5	130.7	83.7
141+38 (12.5')			138.7	88.8	133.8	85.7	131.4	84.1
141+38 (15.5')	129.5	82.9	118.3	75.7	126.1	80.7	122.3	78.2
Average				85.0		84.2		82.1
Average		87.9		84.3		84.1		81.7

8/23/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller			
	Correlated Target:		149.8 pcf		149.8 pcf		145.6 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
141+51 (0.5')			127.4	85.0	129.0	86.1	124.1	85.2
141+51 (3.5')	140.3	89.8	136.4	91.1	134.7	89.9	130.3	89.5
141+51 (6.5')			134.4	89.7	131.8	88.0	127.7	87.7
141+51 (9.5')			132.7	88.6	132.6	88.5	128.0	87.9
141+51 (12.5')			129.7	86.6	131.3	87.7	126.0	86.5
141+51 (15.5')			120.6	80.5	127.7	85.2	122.8	84.3
Average				86.9		87.6		86.9
141+59 (0.5')			128.1	85.5	129.8	86.6	126.2	86.7
141+59 (3.5')			135.7	90.6	133.3	89.0	129.9	89.2
141+59 (6.5')	139.4	89.2	135.1	90.2	133.3	89.0	129.7	89.1
141+59 (9.5')			130.5	87.1	131.2	87.6	127.2	87.4
141+59 (12.5')			130.6	87.2	131.1	87.5	126.7	87.0
141+59 (15.5')			125.4	83.7	128.0	85.4	123.4	84.8
Average				87.4		87.5		87.4
141+67 (0.5')			128.5	85.8	129.8	86.6	126.7	87.0
141+67 (3.5')			135.7	91.3	133.7	89.3	130.5	89.6
141+67 (6.5')			133.3	89.0	132.4	88.4	129.6	89.0
141+67 (9.5')	137.3	87.9	133.0	88.8	132.1	88.2	129.3	88.8
141+67 (12.5')			132.8	88.7	130.6	87.2	126.8	87.1
141+67 (15.5')			122.6	81.8	127.9	85.4	122.7	84.3
Average				87.6		87.5		87.6
141+75 (0.5')			128.2	85.6	128.8	86.0	125.5	86.2
141+75 (3.5')			138.9	92.7	134.3	89.7	130.5	89.6
141+75 (6.5')			134.8	90.0	132.2	88.3	128.8	88.5
141+75 (9.5')			136.9	91.4	133.1	88.9	129.9	89.2
141+75 (12.5')	141.6	90.7	138.4	92.4	134.6	90.0	130.0	89.3
141+75 (15.5')			121.0	80.8	126.7	84.6	120.7	82.9
Average				88.8		87.9		87.6
141+38 (0.5')	135.3	86.6	129.2	86.2	129.5	86.4	126.1	86.6
141+38 (3.5')			138.4	92.4	133.8	89.3	129.9	89.2
141+38 (6.5')			134.4	89.7	132.0	88.1	128.8	88.5
141+38 (9.5')			137.3	91.7	133.5	89.1	130.7	89.8
141+38 (12.5')			138.7	92.6	133.8	89.3	131.4	90.2
141+38 (15.5')	129.5	82.9	118.3	79.0	126.1	84.2	122.3	84.0
Average				88.6		87.7		88.1
Average		87.9		87.9		87.6		87.5

8/23/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller			
Calculated Target = 156.0			Gravity = 2.500					
Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker		
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
159+00 (0.5')			131.1	84.0	130.0	83.3	124.1	79.6
159+00 (3.5')	139.8	89.6	133.9	85.8	131.3	84.2	125.9	80.7
159+00 (6.5')			134.2	86.0	131.6	84.4	124.8	80.0
159+00 (9.5')			130.5	83.7	129.9	83.3	123.5	79.2
159+00 (12.5')			136.3	87.4	132.1	84.7	125.6	80.5
159+00 (15.5')			107.5	68.9	121.6	77.9	111.6	71.5
Average				82.6		83.0		78.6
159+07 (0.5')			129.6	83.1	130.4	83.6	122.3	78.4
159+07 (3.5')			135.5	86.9	133.2	85.4	125.5	80.4
159+07 (6.5')	137.3	88.0	134.0	85.9	131.2	84.1	124.3	79.6
159+07 (9.5')			132.9	85.2	130.1	83.4	123.9	79.4
159+07 (12.5')			134.3	86.1	131.2	84.1	123.8	79.4
159+07 (15.5')			118.0	75.6	124.4	79.7	118.1	75.7
Average				83.8		83.4		78.8
159+15 (0.5')			129.1	82.8	130.2	83.4	122.2	78.3
159+15 (3.5')			130.8	83.8	133.1	85.3	125.4	80.4
159+15 (6.5')			132.9	85.2	130.7	83.8	123.2	79.0
159+15 (9.5')	132.7	85.0	129.0	82.7	129.1	82.8	121.8	78.0
159+15 (12.5')			135.9	87.1	132.6	85.0	125.5	80.4
159+15 (15.5')			117.3	75.2	123.4	79.1	116.7	74.8
Average				82.8		83.2		78.5
159+22 (0.5')			129.4	82.9	129.6	83.0	120.9	77.5
159+22 (3.5')			136.1	87.2	133.1	85.3	125.5	80.4
159+22 (6.5')			133.3	85.4	131.2	84.1	123.2	78.9
159+22 (9.5')			130.1	83.4	132.3	84.8	122.7	78.6
159+22 (12.5')	133.5	85.6	134.7	86.3	132.2	84.7	125.3	80.3
159+22 (15.5')			110.5	70.8	127.6	81.8	113.4	72.7
Average				82.7		84.0		78.1
159+30 (0.5')	138.3	88.7	130.3	83.5	129.5	83.0	122.4	78.5
159+30 (3.5')			135.6	86.9	132.5	84.9	126.0	80.8
159+30 (6.5')			131.9	84.6	130.5	83.6	123.3	79.0
159+30 (9.5')			129.1	82.8	128.8	82.6	122.1	78.2
159+30 (12.5')			135.8	87.1	131.0	83.9	125.6	80.5
159+30 (15.5')	127.2	81.5	118.1	75.7	123.6	79.2	116.7	74.8
Average				83.4		82.9		78.6
Average		86.4		83.1		83.3		78.5

8/23/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller			
	Correlated Target:		150.5 pcf		149.9 pcf		142.0 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
159+00 (0.5')			131.1	87.1	130.0	86.7	124.1	87.4
159+00 (3.5')	139.8	89.6	133.9	89.0	131.3	87.6	125.9	88.7
159+00 (6.5')			134.2	89.2	131.6	87.8	124.8	87.9
159+00 (9.5')			130.5	86.7	129.9	86.7	123.5	87.0
159+00 (12.5')			136.3	90.6	132.1	88.1	125.6	88.5
159+00 (15.5')			107.5	71.4	121.6	81.1	111.6	78.6
Average				85.7		86.3		86.4
159+07 (0.5')			129.6	86.1	130.4	87.0	122.3	86.1
159+07 (3.5')			135.5	90.0	133.2	88.9	125.5	88.4
159+07 (6.5')	137.3	88.0	134.0	89.0	131.2	87.5	124.3	87.5
159+07 (9.5')			132.9	88.3	130.1	86.8	123.9	87.3
159+07 (12.5')			134.3	89.2	131.2	87.5	123.8	87.2
159+07 (15.5')			118.0	78.4	124.4	83.0	118.1	83.2
Average				86.8		86.8		86.6
159+15 (0.5')			129.1	85.8	130.2	86.9	122.2	86.1
159+15 (3.5')			130.8	86.9	133.1	88.8	125.4	88.3
159+15 (6.5')			132.9	88.3	130.7	87.2	123.2	86.8
159+15 (9.5')	132.7	85.0	129.0	85.7	129.1	86.1	121.8	85.8
159+15 (12.5')			135.9	90.3	132.6	88.5	125.5	88.4
159+15 (15.5')			117.3	77.9	123.4	82.3	116.7	82.2
Average				85.8		86.6		86.3
159+22 (0.5')			129.4	86.0	129.6	86.5	120.9	85.1
159+22 (3.5')			136.1	90.4	133.1	88.8	125.5	88.4
159+22 (6.5')			133.3	88.6	131.2	87.5	123.2	86.8
159+22 (9.5')			130.1	86.4	132.3	88.3	122.7	86.4
159+22 (12.5')	133.5	85.6	134.7	89.5	132.2	88.2	125.3	88.2
159+22 (15.5')			110.5	73.4	127.6	85.1	113.4	79.9
Average				85.7		87.4		85.8
159+30 (0.5')	138.3	88.7	130.3	86.6	129.5	86.4	122.4	86.2
159+30 (3.5')			135.6	90.1	132.5	88.4	126.0	88.7
159+30 (6.5')			131.9	87.6	130.5	87.1	123.3	86.8
159+30 (9.5')			129.1	85.8	128.8	85.9	122.1	86.0
159+30 (12.5')			135.8	90.2	131.0	87.4	125.6	88.5
159+30 (15.5')	127.2	81.5	118.1	78.5	123.6	82.5	116.7	82.2
Average				86.5		86.3		86.4
Average		86.4		86.1		86.7		86.3

8/25/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller (finish)			
	Calculated Target = 155.4			Gravity = 2.490				
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
161+79 (0.5')			132.0	84.9	130.2	83.8	123.2	79.3
161+79 (3.5')	142.5	91.7	140.4	90.3	134.4	86.5	126.8	81.6
161+79 (6.5')			140.3	90.3	134.4	86.5	126.9	81.7
161+79 (9.5')			137.8	88.7	133.1	85.6	126.0	81.1
161+79 (12.5')			137.9	88.7	133.4	85.8	124.9	80.4
161+79 (15.5')			137.2	88.3	133.1	85.6	124.4	80.1
Average				88.5		85.6		80.7
161+86 (0.5')			128.1	82.4	128.6	82.8	122.2	78.6
161+86 (3.5')			142.1	91.4	134.7	86.7	126.9	81.7
161+86 (6.5')	143.3	92.2	141.9	91.3	135.2	87.0	127.9	82.3
161+86 (9.5')			139.1	89.5	133.4	85.8	126.3	81.3
161+86 (12.5')			134.9	86.8	130.7	84.1	124.4	80.1
161+86 (15.5')			136.7	88.0	132.4	85.2	125.4	80.7
Average				88.2		85.3		80.8
161+94 (0.5')			125.4	80.7	127.0	81.7	120.5	77.5
161+94 (3.5')			141.0	90.7	133.2	85.7	126.9	81.7
161+94 (6.5')			140.8	90.6	133.5	85.9	126.9	81.7
161+94 (9.5')	141.0	90.8	139.4	89.7	132.8	85.5	127.1	81.8
161+94 (12.5')			136.0	87.5	130.8	84.2	126.1	81.1
161+94 (15.5')			136.0	87.5	131.4	84.6	125.1	80.5
Average				87.8		84.6		80.7
162+02 (0.5')			128.8	82.9	128.2	82.5	122.8	79.0
162+02 (3.5')			140.4	90.3	133.5	85.9	128.0	82.4
162+02 (6.5')			141.0	90.7	133.9	86.2	127.8	82.2
162+02 (9.5')			140.3	90.3	132.5	85.3	127.4	82.0
162+02 (12.5')	140.7	90.6	137.0	88.2	129.6	83.4	124.1	79.9
162+02 (15.5')			136.8	88.0	131.7	84.7	125.8	81.0
Average				88.4		84.7		81.1
162+10 (0.5')	136.2	87.7	129.3	83.2	128.2	82.5	122.0	78.5
162+10 (3.5')			140.3	90.3	132.9	85.5	127.8	82.2
162+10 (6.5')			141.0	90.7	133.9	86.2	128.0	82.4
162+10 (9.5')			137.7	88.6	131.6	84.7	127.1	81.8
162+10 (12.5')			140.2	90.2	133.5	85.9	123.5	79.5
162+10 (15.5')	138.2	88.9	135.5	87.2	131.0	84.3	124.5	80.1
Average				88.4		84.8		80.7
Average		90.3		88.3		85.0		80.8

8/25/2005	Wayne Co	34363.3.14	NC-117	RS-9.5C	Hamm Roller (finish)			
	Correlated Target:		152.0 pcf		146.1 pcf		138.9 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
161+79 (0.5')			132.0	86.8	130.2	89.1	123.2	88.7
161+79 (3.5')	142.5	91.7	140.4	92.4	134.4	92.0	126.8	91.3
161+79 (6.5')			140.3	92.3	134.4	92.0	126.9	91.4
161+79 (9.5')			137.8	90.7	133.1	91.1	126.0	90.7
161+79 (12.5')			137.9	90.7	133.4	91.3	124.9	89.9
161+79 (15.5')			137.2	90.3	133.1	91.1	124.4	89.6
Average				90.5		91.1		90.3
161+86 (0.5')			128.1	84.3	128.6	88.0	122.2	88.0
161+86 (3.5')			142.1	93.5	134.7	92.2	126.9	91.4
161+86 (6.5')	143.3	92.2	141.9	93.4	135.2	92.5	127.9	92.1
161+86 (9.5')			139.1	91.5	133.4	91.3	126.3	90.9
161+86 (12.5')			134.9	88.8	130.7	89.5	124.4	89.6
161+86 (15.5')			136.7	89.9	132.4	90.6	125.4	90.3
Average				90.2		90.7		90.4
161+94 (0.5')			125.4	82.5	127.0	86.9	120.5	86.8
161+94 (3.5')			141.0	92.8	133.2	91.2	126.9	91.4
161+94 (6.5')			140.8	92.6	133.5	91.4	126.9	91.4
161+94 (9.5')	141.0	90.8	139.4	91.7	132.8	90.9	127.1	91.5
161+94 (12.5')			136.0	89.5	130.8	89.5	126.1	90.8
161+94 (15.5')			136.0	89.5	131.4	89.9	125.1	90.1
Average				89.8		90.0		90.3
162+02 (0.5')			128.8	84.7	128.2	87.7	122.8	88.4
162+02 (3.5')			140.4	92.4	133.5	91.4	128.0	92.2
162+02 (6.5')			141.0	92.8	133.9	91.6	127.8	92.0
162+02 (9.5')			140.3	92.3	132.5	90.7	127.4	91.7
162+02 (12.5')	140.7	90.6	137.0	90.1	129.6	88.7	124.1	89.3
162+02 (15.5')			136.8	90.0	131.7	90.1	125.8	90.6
Average				90.4		90.1		90.7
162+10 (0.5')	136.2	87.7	129.3	85.1	128.2	87.7	122.0	87.8
162+10 (3.5')			140.3	92.3	132.9	91.0	127.8	92.0
162+10 (6.5')			141.0	92.8	133.9	91.6	128.0	92.2
162+10 (9.5')			137.7	90.6	131.6	90.1	127.1	91.5
162+10 (12.5')			140.2	92.2	133.5	91.4	123.5	88.9
162+10 (15.5')	138.2	88.9	135.5	89.1	131.0	89.7	124.5	89.6
Average				90.4		90.2		90.3
Average		90.3		90.3		90.4		90.4

10/5/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm (Breakdown)			
Calculated Target = 153.8			Gravity = 2.465					
Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker		
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
588+15 (0.5')			125.0	81.3	129.4	84.1	120.9	78.6
588+15 (2.7')			143.6	93.4	138.5	90.1	131.0	85.2
588+15 (4.9')			137.2	89.2	135.1	87.8	127.5	82.9
588+15 (7.1')			141.3	91.9	138.0	89.7	130.0	84.5
588+15 (9.3')	142.9	92.9	141.3	91.9	131.3	85.4	130.8	85.0
588+15 (11.5')			129.6	84.3	133.1	86.5	124.1	80.7
Average				88.7		87.3		82.8
587+90 (0.5')			125.2	81.4	129.1	83.9	122.1	79.4
587+90 (2.7')			140.1	91.1	137.6	89.5	129.8	84.4
587+90 (4.9')			137.2	89.2	135.7	88.2	127.3	82.8
587+90 (7.1')	144.6	94.0	144.5	94.0	138.8	90.2	131.1	85.2
587+90 (9.3')			143.0	93.0	138.9	90.3	129.5	84.2
587+90 (11.5')			131.6	85.6	132.5	86.2	123.3	80.2
Average				89.1		88.1		82.7
587+65 (0.5')			116.7	75.9	126.8	82.4	120.4	78.3
587+65 (2.7')			142.5	92.7	139.1	90.4	129.8	84.4
587+65 (4.9')	138.8	90.3	135.9	88.4	135.7	88.2	126.2	82.1
587+65 (7.1')			145.2	94.4	140.3	91.2	130.5	84.9
587+65 (9.3')			146.1	95.0	140.5	91.4	131.6	85.6
587+65 (11.5')			133.3	86.7	134.0	87.1	125.0	81.3
Average				88.9		88.5		82.8
587+40 (0.5')			127.2	82.7	131.4	85.4	122.7	79.8
587+40 (2.7')	146.1	95.0	145.9	94.9	140.3	91.2	132.5	86.2
587+40 (4.9')			140.2	91.2	137.8	89.6	128.7	83.7
587+40 (7.1')			143.8	93.5	139.9	91.0	130.6	84.9
587+40 (9.3')			143.6	93.4	139.6	90.8	131.9	85.8
587+40 (11.5')			129.5	84.2	132.2	86.0	125.1	81.3
Average				90.0		89.0		83.6
587+15 (0.5')	134.4	87.4	130.3	84.7	132.3	86.0	123.8	80.5
587+15 (2.7')			145.0	94.3	140.3	91.2	131.3	85.4
587+15 (4.9')			139.5	90.7	138.0	89.7	128.6	83.6
587+15 (7.1')			144.4	93.9	140.4	91.3	131.2	85.3
587+15 (9.3')			143.0	93.0	139.2	90.5	131.1	85.2
587+15 (11.5')	135.7	88.2	132.4	86.1	133.3	86.7	123.5	80.3
Average				90.5		89.2		83.4
Average		91.3		89.4		88.4		83.1

10/5/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm and IR			
	Correlated Target =		151.6 pcf		148.2 pcf		140.2 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
588+15 (0.5')			125.0	82.4	129.4	87.3	120.9	86.2
588+15 (2.7')			143.6	94.7	138.5	93.5	131.0	93.4
588+15 (4.9')			137.2	90.5	135.1	91.2	127.5	90.9
588+15 (7.1')			141.3	93.2	138.0	93.1	130.0	92.7
588+15 (9.3')	142.9	92.9	141.3	93.2	131.3	88.6	130.8	93.3
588+15 (11.5')			129.6	85.5	133.1	89.8	124.1	88.5
Average				89.9		90.6		90.8
587+90 (0.5')			125.2	82.6	129.1	87.1	122.1	87.1
587+90 (2.7')			140.1	92.4	137.6	92.8	129.8	92.6
587+90 (4.9')			137.2	90.5	135.7	91.6	127.3	90.8
587+90 (7.1')	144.6	94.0	144.5	95.3	138.8	93.7	131.1	93.5
587+90 (9.3')			143.0	94.3	138.9	93.7	129.5	92.4
587+90 (11.5')			131.6	86.8	132.5	89.4	123.3	87.9
Average				90.3		91.4		90.7
587+65 (0.5')			116.7	77.0	126.8	85.6	120.4	85.9
587+65 (2.7')			142.5	94.0	139.1	93.9	129.8	92.6
587+65 (4.9')	138.8	90.3	135.9	89.6	135.7	91.6	126.2	90.0
587+65 (7.1')			145.2	95.8	140.3	94.7	130.5	93.1
587+65 (9.3')			146.1	96.4	140.5	94.8	131.6	93.9
587+65 (11.5')			133.3	87.9	134.0	90.4	125.0	89.2
Average				90.1		91.8		90.8
587+40 (0.5')			127.2	83.9	131.4	88.7	122.7	87.5
587+40 (2.7')	146.1	95.0	145.9	96.2	140.3	94.7	132.5	94.5
587+40 (4.9')			140.2	92.5	137.8	93.0	128.7	91.8
587+40 (7.1')			143.8	94.9	139.9	94.4	130.6	93.2
587+40 (9.3')			143.6	94.7	139.6	94.2	131.9	94.1
587+40 (11.5')			129.5	85.4	132.2	89.2	125.1	89.2
Average				91.3		92.4		91.7
587+15 (0.5')	134.4	87.4	130.3	85.9	132.3	89.3	123.8	88.3
587+15 (2.7')			145.0	95.6	140.3	94.7	131.3	93.7
587+15 (4.9')			139.5	92.0	138.0	93.1	128.6	91.7
587+15 (7.1')			144.4	95.3	140.4	94.7	131.2	93.6
587+15 (9.3')			143.0	94.3	139.2	93.9	131.1	93.5
587+15 (11.5')	135.7	88.2	132.4	87.3	133.3	89.9	123.5	88.1
Average				91.7		92.6		91.5
Average		91.3		90.7		91.8		91.1

10/18/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm (Breakdown)			
	Calculated Target = 153.7			Gravity = 2.463		Sakai vibratory tire roller (Intermediate)		
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
781+75 (0.5')			130.5	84.9	132.0	85.9	127.3	82.8
781+75 (2.7')			144.2	93.8	138.8	90.4	130.8	85.1
781+75 (4.9')			138.2	89.9	135.4	88.1	126.3	82.2
781+75 (7.1')			142.2	92.5	138.5	90.1	128.5	83.6
781+75 (9.3')	142.1	92.5	142.2	92.5	137.3	89.4	128.5	83.6
781+75 (11.5')			133.3	86.7	133.0	86.4	122.9	80.0
Average				90.1		88.4		82.9
781+50 (0.5')			133.6	86.9	133.5	86.9	123.1	80.1
781+50 (2.7')			145.2	94.5	140.1	91.2	130.5	84.9
781+50 (4.9')			137.3	89.3	135.7	88.4	126.6	82.4
781+50 (7.1')	141.6	92.2	143.1	93.1	138.3	90.0	128.5	83.6
781+50 (9.3')			140.5	91.4	137.1	89.2	128.3	83.5
781+50 (11.5')			131.9	85.8	132.5	86.2	121.7	79.2
Average				90.2		88.7		82.3
781+25 (0.5')			125.3	81.5	130.0	84.6	118.4	77.1
781+25 (2.7')			144.6	94.1	140.6	91.4	131.1	85.3
781+25 (4.9')	135.4	88.1	133.3	86.7	134.5	87.5	122.7	79.9
781+25 (7.1')			141.3	91.9	139.1	90.6	127.8	83.1
781+25 (9.3')			141.9	92.3	138.4	90.1	127.6	83.1
781+25 (11.5')			130.2	84.7	132.3	86.1	121.0	78.7
Average				88.5		88.4		81.2
781+00 (0.5')			128.0	83.3	134.2	85.7	122.3	79.6
781+00 (2.7')	145.0	94.3	143.9	93.6	140.2	91.2	129.9	84.5
781+00 (4.9')			137.7	89.6	136.6	88.9	126.2	82.1
781+00 (7.1')			141.3	91.9	137.8	89.7	127.9	83.2
781+00 (9.3')			139.6	90.8	137.9	89.7	128.4	83.5
781+00 (11.5')			127.3	82.8	131.1	85.3	121.8	79.2
Average				88.7		88.4		82.0
780+75 (0.5')	135.8	88.4	133.3	86.7	133.5	86.9	121.2	78.9
780+75 (2.7')			142.9	93.0	139.7	90.9	129.8	84.5
780+75 (4.9')			133.6	86.9	134.8	87.7	125.2	81.5
780+75 (7.1')			137.1	89.2	136.2	88.6	127.8	83.2
780+75 (9.3')			143.1	93.1	138.0	89.8	128.1	83.4
780+75 (11.5')	133.6	86.9	127.4	82.9	131.2	85.3	120.7	78.5
Average				88.6		88.2		81.7
Average		90.4		88.5		88.4		82.0

10/18/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm, Sakai rubber tire, and IR			
	Correlated Target =		151.8 pcf		150.2 pcf		138.6 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
781+75 (0.5')			130.5	86.0	132.0	87.9	127.3	91.8
781+75 (2.7')			144.2	95.0	138.8	92.4	130.8	94.3
781+75 (4.9')			138.2	91.0	135.4	90.1	126.3	91.1
781+75 (7.1')			142.2	93.7	138.5	92.2	128.5	92.7
781+75 (9.3')	142.1	92.5	142.2	93.7	137.3	91.4	128.5	92.7
781+75 (11.5')			133.3	87.8	133.0	88.5	122.9	88.6
Average				91.2		90.4		91.9
781+50 (0.5')			133.6	88.0	133.5	88.9	123.1	88.8
781+50 (2.7')			145.2	95.7	140.1	93.3	130.5	94.2
781+50 (4.9')			137.3	90.4	135.7	90.3	126.6	91.3
781+50 (7.1')	141.6	92.2	143.1	94.3	138.3	92.1	128.5	92.7
781+50 (9.3')			140.5	92.6	137.1	91.3	128.3	92.7
781+50 (11.5')			131.9	86.9	132.5	88.2	121.7	87.8
Average				91.3		90.7		91.3
781+25 (0.5')			125.3	82.5	130.0	86.6	118.4	85.4
781+25 (2.7')			144.6	95.3	140.6	93.6	131.1	94.6
781+25 (4.9')	135.4	88.1	133.3	87.8	134.5	89.5	122.7	88.5
781+25 (7.1')			141.3	93.1	139.1	92.6	127.8	92.2
781+25 (9.3')			141.9	93.5	138.4	92.1	127.6	92.1
781+25 (11.5')			130.2	85.8	132.3	88.1	121.0	87.3
Average				89.7		90.4		90.0
781+00 (0.5')			128.0	84.3	134.2	89.3	122.3	88.2
781+00 (2.7')	145.0	94.3	143.9	94.8	140.2	93.3	129.9	93.7
781+00 (4.9')			137.7	90.7	136.6	90.9	126.2	91.1
781+00 (7.1')			141.3	93.1	137.8	91.7	127.9	92.3
781+00 (9.3')			139.6	92.0	137.9	91.8	128.4	92.6
781+00 (11.5')			127.3	83.9	131.1	87.3	121.8	87.9
Average				89.8		90.7		91.0
780+75 (0.5')	135.8	88.4	133.3	87.8	133.5	88.9	121.2	87.4
780+75 (2.7')			142.9	94.1	139.7	93.0	129.8	93.7
780+75 (4.9')			133.6	88.0	134.8	89.7	125.2	90.3
780+75 (7.1')			137.1	90.3	136.2	90.7	127.8	92.2
780+75 (9.3')			143.1	94.3	138.0	91.9	128.1	92.4
780+75 (11.5')	133.6	86.9	127.4	83.9	131.2	87.4	120.7	87.1
Average				89.7		90.3		90.5
Average		90.4		90.3		90.5		90.9

10/18/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm (Breakdown)			
	Calculated Target = 153.5			Gravity = 2.460		Sakai vibratory tire roller (Intermediate)		
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
858+50 (0.5')			137.1	89.3	134.5	87.6	124.1	80.8
858+50 (2.7')			143.1	93.2	139.8	90.9	128.4	83.6
858+50 (4.9')			137.6	89.6	135.3	88.0	125.1	81.5
858+50 (7.1')			141.9	92.4	136.9	89.1	126.9	82.7
858+50 (9.3')	141.9	92.4	142.0	92.5	138.0	90.0	127.8	83.3
858+50 (11.5')			138.3	90.1	134.6	87.6	125.0	81.4
Average				91.2		88.9		82.2
858+25 (0.5')			138.5	90.2	134.5	87.5	124.6	81.2
858+25 (2.7')			143.1	93.2	138.8	90.2	128.8	83.9
858+25 (4.9')			136.2	88.7	135.6	88.3	124.2	80.9
858+25 (7.1')	137.5	89.6	141.4	92.1	138.2	89.9	127.3	82.9
858+25 (9.3')			142.9	93.1	138.7	90.2	128.7	83.8
858+25 (11.5')			133.9	87.2	134.8	87.7	124.7	81.2
Average				90.8		89.0		82.3
858+00 (0.5')			138.6	90.3	135.2	87.9	125.5	81.8
858+00 (2.7')			143.2	93.3	137.7	89.6	128.1	83.5
858+00 (4.9')	143.6	93.9	134.6	87.7	135.3	87.7	125.8	82.0
858+00 (7.1')			141.4	92.1	137.2	89.3	127.8	83.3
858+00 (9.3')			141.4	92.1	138.6	89.6	128.5	83.7
858+00 (11.5')			133.0	86.6	131.7	85.7	121.4	79.1
Average				90.4		88.3		82.2
857+75 (0.5')			134.9	87.9	133.3	86.7	124.9	81.4
857+75 (2.7')	139.9	91.1	140.8	91.6	137.4	89.4	128.8	83.9
857+75 (4.9')			135.4	88.2	133.9	87.2	124.9	81.4
857+75 (7.1')			141.9	92.4	137.4	89.4	129.0	84.0
857+75 (9.3')			142.3	92.7	138.2	89.9	129.4	84.3
857+75 (11.5')			132.5	86.3	133.0	86.5	124.0	80.8
Average				89.9		88.2		82.6
857+50 (0.5')	141.7	92.3	139.7	91.0	136.1	88.5	126.5	82.4
857+50 (2.7')			145.2	94.6	139.9	90.9	130.8	85.2
857+50 (4.9')			135.7	88.4	135.0	87.9	126.1	82.1
857+50 (7.1')			140.3	91.4	137.3	89.3	127.7	83.2
857+50 (9.3')			141.4	92.1	138.3	90.0	129.4	84.3
857+50 (11.5')	143.0	93.1	133.1	86.7	133.2	86.8	125.7	81.9
Average				90.7		88.9		83.2
Average		92.1		90.6		88.7		82.5

10/18/2005	Wilson Co	36691.3.1	I-95	S 12.5 D	Sakai 4400 vpm (Breakdown)			
	Correlated Target =		150.5 pcf		148.1		137.9 pcf	
	Core Results		Nuclear Gauge (4640-B)		PQI Device		Pavetracker	
Station (offset)	PCF	Percent	PCF	Percent	PCF	Percent	PCF	Percent
858+50 (0.5')			137.1	91.1	134.5	90.8	124.1	90.0
858+50 (2.7')			143.1	95.1	139.8	94.3	128.4	93.1
858+50 (4.9')			137.6	91.4	135.3	91.4	125.1	90.7
858+50 (7.1')			141.9	94.3	136.9	92.4	126.9	92.0
858+50 (9.3')	141.9	92.4	142.0	94.4	138.0	93.2	127.8	92.7
858+50 (11.5')			138.3	91.9	134.6	90.9	125.0	90.6
Average				93.0		92.2		91.5
858+25 (0.5')			138.5	92.0	134.5	90.8	124.6	90.4
858+25 (2.7')			143.1	95.1	138.8	93.7	128.8	93.4
858+25 (4.9')			136.2	90.5	135.6	91.6	124.2	90.1
858+25 (7.1')	137.5	89.6	141.4	94.0	138.2	93.3	127.3	92.3
858+25 (9.3')			142.9	95.0	138.7	93.7	128.7	93.3
858+25 (11.5')			133.9	89.0	134.8	91.0	124.7	90.4
Average				92.6		92.4		91.7
858+00 (0.5')			138.6	92.1	135.2	91.3	125.5	91.0
858+00 (2.7')			143.2	95.1	137.7	93.0	128.1	92.9
858+00 (4.9')	143.6	93.9	134.6	89.4	135.3	91.4	125.8	91.2
858+00 (7.1')			141.4	94.0	137.2	92.6	127.8	92.7
858+00 (9.3')			141.4	94.0	138.6	93.6	128.5	93.2
858+00 (11.5')			133.0	88.4	131.7	88.9	121.4	88.0
Average				92.2		91.8		91.5
857+75 (0.5')			134.9	89.6	133.3	90.0	124.9	90.6
857+75 (2.7')	139.9	91.1	140.8	93.6	137.4	92.8	128.8	93.4
857+75 (4.9')			135.4	90.0	133.9	90.4	124.9	90.6
857+75 (7.1')			141.9	94.3	137.4	92.8	129.0	93.5
857+75 (9.3')			142.3	94.6	138.2	93.3	129.4	93.8
857+75 (11.5')			132.5	88.0	133.0	89.8	124.0	89.9
Average				91.7		91.5		92.0
857+50 (0.5')	141.7	92.3	139.7	92.8	136.1	91.9	126.5	91.7
857+50 (2.7')			145.2	96.5	139.9	94.5	130.8	94.9
857+50 (4.9')			135.7	90.2	135.0	91.2	126.1	91.4
857+50 (7.1')			140.3	93.2	137.3	92.7	127.7	92.6
857+50 (9.3')			141.4	94.0	138.3	93.4	129.4	93.8
857+50 (11.5')	143.0	93.1	133.1	88.4	133.2	89.9	125.7	91.2
Average				92.5		92.3		92.6
Average		92.1		92.4		92.0		91.9

Conclusion

Based on the results from this research we will continue to conduct evaluations of the PQI and Pavetracker devices. One observation indicates that when comparing one core result to one non-destructive device reading from the same location, the results do vary. However, when looking at the averages of the test sections the results are much closer. For this reason, we feel that when testing with a non-destructive testing device a given test section should be tested with a greater number of readings than normally tested when coring a mat. For example, if a 2000-foot test section is tested with one core for acceptance then, as a minimum, five readings should be taken with a non-destructive testing device. The data also suggests that using a Control Strip provides a means to compensate for irregularities that may influence the devices and though some cores are necessary, far fewer are cut than would be if density acceptance was based on core control. The results also show that as a general trend, lower density readings occurred on the edges and in middle. Obviously obtaining a reading with a non-destructive device extremely close to the edge of the mat will result in a lower density reading. However, while testing we noticed a segregated section that ran longitudinally down the center of the mat and density readings taken in that area usually ran lower. A proposal has been made to choose two resurfacing projects next paving season (2006) to utilize the PQI and Pavetracker along with a Troxler 4640-B. If accepted this proposal will provide an opportunity to gain more data from an entire paving project instead of a few chosen sections within a project.

APPENDIX A

TEST SECTION LAYOUT

