



PUBLIC WORKS

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MEMORANDUM

DATE: January 10, 2017

TO: Steve Morgan, Environmental Permitting Manager, FDEP
Lance Kautz, Environmental Specialist I, FDEP

FROM: Larry Ruiz, Section Manager, Public Works, SWMD

SUBJECT: Hillsborough County Biosolids Composting Monthly Report: December 2016

| | |
|------------------------------------|--|
| Biosolids Received (wet tons): | 1254.84 tons received 12/6 through 12/31 |
| Source of Biosolids: | Hillsborough County AWWTP (Falkenburg, Valrico, and South) |
| Source of Bulking Agent: | Hillsborough County Yard Waste Processing Sites (Falkenburg Road and South County facilities) |
| General Description of Activities: | <ul style="list-style-type: none"> • All incoming biosolids were mixed with bulking agent and formed into windrows on the same day as received. • 7 total windrows are in active composting as of 12/31/16. • Windrow temperatures were monitored daily. • 1 windrow has met temperature and time requirements of the Process to Further Reduce Pathogens (PFRP). • 1 windrow have been turned. • The previous 9 windrows have been moved to the curing section and combined for a total of 4 large windrows. • No sampling or analysis was performed. • No compost was distributed for use. |
| Attachments: | A-F; Windrow construction and temperature records. |

RWW/rww
Attachments

CC: Beth Schinella, Division Director, Utility Operations, PUD
Kim Byer, Division Director, Solid Waste Management Division, PWD
Ron Wiesman, Manager, Southeast County Landfill, PWD/SWMD

Attachment A

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow #_16-12-9 | |
|---|---------------|------------------|-------------------------|-------------------------|-------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-6-16 | Date Completed: 12-9-16 | | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/6/16 | Oscar Ochoa | 22.29 | 28.98 | 60.00 | | |
| 12/6/16 | Oscar Ochoa | 22.54 | 29.30 | 60.00 | 32.00 | |
| 12/7/16 | Mike Bayne | 21.36 | 27.77 | 60.00 | | |
| 12/7/16 | Mike Bayne | 21.83 | 28.38 | 60.00 | 36.00 | |
| 12/8/16 | Mike Bayne | 21.37 | 27.78 | 60.00 | | |
| 12/8/16 | Mike Bayne | 21.71 | 28.22 | 60.00 | 32.00 | |
| 12/9/16 | Oscar Ochoa | 21.39 | 27.81 | 60.00 | | |
| 12/9/16 | Oscar Ochoa | 21.32 | 27.72 | 60.00 | 40.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 173.81 | 225.95 | 480.00 | 140.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.74 / 1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 16-12-9 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| Temperature: Shading equals temperature 131 or greater for PFRP. | | | | | | | | | | | | | | | | | | | | | | |
| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/10/16 | 160 | 170 | 170 | 161 | 174 | 180 | 178 | 178 | 175 | 178 | 178 | 178 | 170 | 170 | 138 | 138 | 169.75 | 174.5 | 166 | 163.75 | |
| 2 | 12/11/16 | | | | | | | | | | | | | | | | | | | | | |
| 3 | 12/12/16 | 165 | 171 | 172 | 165 | 171 | 175 | 172 | 166 | 170 | 175 | 175 | 172 | 164 | 166 | 149 | 141 | 167.5 | 171.75 | 167 | 161 | |
| 4 | 12/13/16 | 168 | 172 | 174 | 168 | 168 | 170 | 164 | 160 | 165 | 172 | 170 | 160 | 161 | 164 | 158 | 142 | 165.5 | 169.5 | 166.5 | 157.5 | |
| 5 | 12/14/16 | 162 | 170 | 176 | 168 | 166 | 169 | 164 | 160 | 166 | 175 | 168 | 162 | 160 | 165 | 158 | 142 | 163.5 | 169.75 | 166.5 | 158 | |
| 6 | 12/15/16 | 158 | 166 | 180 | 167 | 163 | 167 | 163 | 159 | 168 | 180 | 166 | 163 | 158 | 165 | 159 | 144 | 161.75 | 169.5 | 167 | 158.25 | |
| 7 | 12/16/16 | 160 | 168 | 172 | 168 | 160 | 168 | 164 | 158 | 163 | 170 | 168 | 166 | 162 | 166 | 154 | 158 | 161.25 | 168 | 164.5 | 162.5 | |
| 8 | 12/17/16 | 160 | 170 | 172 | 170 | 165 | 169 | 162 | 158 | 161 | 175 | 175 | 169 | 158 | 160 | 150 | 155 | 161 | 168.5 | 164.75 | 163 | |
| 9 | 12/18/16 | | | | | | | | | | | | | | | | | | | | | |
| 10 | 12/19/16 | 144 | 170 | 170 | 166 | 161 | 166 | 162 | 158 | 160 | 172 | 170 | 168 | 160 | 160 | 148 | 150 | 156.25 | 167 | 162.5 | 160.5 | |
| 11 | 12/20/16 | 132 | 160 | 165 | 167 | 160 | 163 | 161 | 160 | 160 | 164 | 165 | 165 | 152 | 160 | 144 | 140 | 151 | 161.75 | 158.75 | 158 | |
| 12 | 12/21/16 | 138 | 152 | 168 | 172 | 148 | 169 | 170 | 162 | 140 | 169 | 174 | 174 | 149 | 168 | 156 | 154 | 143.75 | 164.5 | 167 | 165.5 | |
| 13 | 12/22/16 | 131 | 140 | 162 | 170 | 142 | 164 | 170 | 165 | 136 | 168 | 173 | 176 | 142 | 168 | 174 | 168 | 137.75 | 160 | 169.75 | 169.75 | |
| 14 | 12/23/16 | 132 | 152 | 161 | 163 | 152 | 162 | 168 | 169 | 150 | 162 | 168 | 168 | 160 | 161 | 150 | 140 | 148.5 | 159.25 | 161.75 | 160 | |
| 15 | 12/24/16 | 138 | 152 | 161 | 168 | 150 | 161 | 163 | 164 | 151 | 160 | 164 | 170 | 140 | 161 | 160 | 145 | 144.75 | 158.5 | 162 | 161.75 | |
| 16 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 17 | 12/26/16 | 150 | 161 | 161 | 158 | 160 | 168 | 160 | 150 | 141 | 150 | 160 | 160 | 145 | 150 | 142 | 139 | 149 | 157.25 | 155.75 | 151.75 | Yes |
| 18 | 12/27/16 | 152 | 160 | 158 | 156 | 150 | 160 | 161 | 158 | 138 | 150 | 158 | 162 | 142 | 148 | 139 | 132 | 145.5 | 154.5 | 154 | 152 | |
| 19 | 12/28/16 | 135 | 159 | 172 | 173 | 160 | 171 | 170 | 170 | 131 | 162 | 172 | 160 | 155 | 171 | 169 | 173 | 145.25 | 165.75 | 170.75 | 169 | |
| 20 | 12/29/16 | 155 | 160 | 160 | 158 | 162 | 156 | 144 | 142 | 162 | 156 | 150 | 142 | 164 | 152 | 142 | 136 | 160.75 | 156 | 149 | 144.5 | |
| 21 | 12/30/16 | 155 | 161 | 163 | 160 | 160 | 155 | 158 | 150 | 160 | 155 | 157 | 155 | 160 | 155 | 150 | 150 | 158.75 | 156.5 | 157 | 153.75 | |
| 22 | 12/31/16 | 155 | 161 | 165 | 162 | 150 | 160 | 161 | 152 | 150 | 160 | 161 | 162 | 157 | 160 | 157 | 150 | 153 | 160.25 | 161 | 156.5 | |

Attachment B

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow #16-12-14 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-10-16 | | Date Completed: 12-14-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/10/16 | Oscar Ochoa | 22.32 | 29.02 | 60.00 | | |
| 12/10/16 | Oscar Ochoa | 22.82 | 29.67 | 60.00 | 40.00 | |
| 12/12/16 | Oscar Ochoa | 22.01 | 28.61 | 60.00 | | |
| 12/12/16 | Oscar Ochoa | 22.23 | 28.90 | 60.00 | 32.00 | |
| 12/13/16 | Oscar Ochoa | 20.96 | 27.25 | 60.00 | | |
| 12/13/16 | Oscar Ochoa | 19.27 | 25.05 | 60.00 | 32.00 | |
| 12/14/16 | Mike Bayne | 21.43 | 27.86 | 60.00 | | |
| 12/14/16 | Mike Bayne | 22.59 | 29.37 | 60.00 | 40.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 173.63 | 225.72 | 480.00 | 144.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.76 /1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 16-12-14 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| Temperature: Shading equals temperature 131 or greater for PFRP. | | | | | | | | | | | | | | | | | | | | | | |
| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/15/16 | 158 | 156 | 140 | 138 | 150 | 148 | 134 | 131 | 160 | 158 | 132 | 130 | 140 | 131 | 120 | 110 | 152 | 148.25 | 131.5 | 127.25 | |
| 2 | 12/16/16 | 161 | 159 | 140 | 140 | 164 | 162 | 140 | 131 | 160 | 165 | 138 | 132 | 144 | 140 | 138 | 122 | 157.25 | 156.5 | 139 | 131.25 | |
| 3 | 12/17/16 | 160 | 159 | 148 | 146 | 160 | 164 | 148 | 142 | 162 | 164 | 146 | 140 | 149 | 152 | 138 | 128 | 157.75 | 159.75 | 145 | 139 | |
| 4 | 12/18/16 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 12/19/16 | 160 | 166 | 164 | 164 | 163 | 170 | 166 | 150 | 154 | 166 | 158 | 156 | 160 | 162 | 138 | 132 | 159.25 | 166 | 156.5 | 150.5 | |
| 6 | 12/20/16 | 159 | 164 | 164 | 160 | 161 | 168 | 166 | 150 | 152 | 166 | 163 | 159 | 158 | 164 | 147 | 138 | 157.5 | 165.5 | 160 | 151.75 | |
| 7 | 12/21/16 | 154 | 166 | 164 | 157 | 159 | 168 | 164 | 151 | 152 | 165 | 167 | 161 | 156 | 165 | 158 | 142 | 155.25 | 166 | 163.25 | 152.75 | |
| 8 | 12/22/16 | 143 | 163 | 165 | 163 | 149 | 163 | 163 | 152 | 150 | 161 | 164 | 162 | 162 | 169 | 162 | 140 | 151 | 164 | 163.5 | 154.25 | |
| 9 | 12/23/16 | 160 | 159 | 158 | 150 | 160 | 158 | 150 | 142 | 150 | 162 | 162 | 158 | 161 | 164 | 150 | 138 | 157.75 | 160.75 | 155 | 147 | |
| 10 | 12/24/16 | 142 | 159 | 158 | 150 | 152 | 160 | 158 | 150 | 142 | 158 | 161 | 150 | 151 | 152 | 158 | 152 | 146.75 | 157.25 | 158.75 | 150.5 | |
| 11 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 12/26/16 | 132 | 160 | 170 | 175 | 132 | 158 | 167 | 170 | 142 | 160 | 165 | 167 | 150 | 160 | 168 | 157 | 139 | 159.5 | 167.5 | 167.25 | |
| 13 | 12/27/16 | 132 | 162 | 169 | 175 | 150 | 160 | 162 | 165 | 143 | 158 | 164 | 164 | 148 | 160 | 162 | 158 | 143.25 | 160 | 164.25 | 165.5 | |
| 14 | 12/28/16 | 152 | 168 | 170 | 162 | 134 | 164 | 163 | 152 | 147 | 162 | 164 | 162 | 161 | 164 | 155 | 148 | 148.5 | 164.5 | 163 | 156 | |
| 15 | 12/29/16 | 156 | 168 | 165 | 158 | 160 | 166 | 164 | 152 | 156 | 160 | 163 | 161 | 164 | 156 | 146 | 138 | 159 | 162.5 | 159.5 | 152.25 | |
| 16 | 12/30/16 | 150 | 160 | 166 | 170 | 160 | 166 | 165 | 160 | 160 | 161 | 165 | 170 | 148 | 151 | 158 | 160 | 154.5 | 159.5 | 163.5 | 165 | |
| 17 | 12/31/16 | 142 | 160 | 171 | 172 | 158 | 162 | 160 | 161 | 160 | 162 | 170 | 171 | 140 | 151 | 158 | 160 | 150 | 158.75 | 164.75 | 166 | |

Attachment C

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow #16-12-19 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-15-16 | | Date Completed: 12-19-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/15/16 | Mike Bayne | 20.70 | 26.91 | 60.00 | | |
| 12/15/16 | Mike Bayne | 21.68 | 28.18 | 60.00 | 40.00 | |
| 12/16/16 | Oscar Ochoa | 21.40 | 27.82 | 48.00 | | |
| 12/16/16 | Oscar Ochoa | 20.34 | 26.44 | 48.00 | 28.00 | |
| 12/17/16 | Oscar Ochoa | 21.53 | 27.99 | 52.00 | | |
| 12/17/16 | Oscar Ochoa | 22.10 | 28.73 | 52.00 | 28.00 | |
| 12/19/16 | Oscar Ochoa | 21.97 | 28.56 | | | |
| 12/19/16 | Oscar Ochoa | 21.66 | 28.16 | 52.00 | 40.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 171.38 | 222.79 | 372.00 | 136.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.28 /1 | | | | |
| | | | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 16-12-19 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| Temperature: Shading equals temperature 131 or greater for PFRP. | | | | | | | | | | | | | | | | | | | | | | |
| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/20/16 | 160 | 161 | 140 | 140 | 160 | 163 | 140 | 138 | 162 | 158 | 132 | 119 | 120 | 119 | 120 | 117 | 150.5 | 150.25 | 133 | 128.5 | |
| 2 | 12/21/16 | 158 | 162 | 154 | 146 | 160 | 158 | 152 | 154 | 164 | 158 | 144 | 122 | 132 | 128 | 124 | 120 | 153.5 | 151.5 | 143.5 | 135.5 | |
| 3 | 12/22/16 | 156 | 160 | 150 | 148 | 158 | 158 | 151 | 156 | 162 | 154 | 137 | 126 | 138 | 139 | 131 | 123 | 153.5 | 152.75 | 142.25 | 138.25 | |
| 4 | 12/23/16 | 154 | 158 | 152 | 150 | 154 | 158 | 154 | 156 | 158 | 157 | 147 | 126 | 140 | 144 | 134 | 128 | 151.5 | 154.25 | 146.75 | 140 | |
| 5 | 12/24/16 | 150 | 160 | 160 | 150 | 154 | 157 | 156 | 156 | 154 | 158 | 152 | 131 | 141 | 146 | 136 | 132 | 149.75 | 155.25 | 151 | 142.25 | |
| 6 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 7 | 12/26/16 | 148 | 162 | 161 | 152 | 150 | 157 | 158 | 157 | 148 | 157 | 157 | 158 | 142 | 148 | 135 | 132 | 147 | 156 | 152.75 | 149.75 | |
| 8 | 12/27/16 | 145 | 160 | 158 | 150 | 150 | 159 | 157 | 150 | 147 | 152 | 150 | 142 | 150 | 150 | 137 | 134 | 148 | 155.25 | 150.5 | 144 | |
| 9 | 12/28/16 | 157 | 165 | 162 | 145 | 165 | 168 | 162 | 153 | 153 | 163 | 150 | 136 | 155 | 154 | 138 | 136 | 157.5 | 162.5 | 153 | 142.5 | |
| 10 | 12/29/16 | 140 | 160 | 162 | 161 | 141 | 158 | 161 | 161 | 150 | 160 | 160 | 157 | 150 | 148 | 140 | 137 | 145.25 | 156.5 | 155.75 | 154 | |
| 11 | 12/30/16 | 140 | 160 | 160 | 152 | 150 | 161 | 162 | 160 | 150 | 157 | 150 | 149 | 140 | 145 | 141 | 137 | 145 | 155.75 | 153.25 | 149.5 | |
| 12 | 12/31/16 | 139 | 160 | 160 | 152 | 152 | 163 | 161 | 160 | 150 | 157 | 151 | 147 | 141 | 149 | 140 | 139 | 145.5 | 157.25 | 153 | 149.5 | |

Attachment D

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 16-12-22 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-19-16 | | Date Completed: 12-22-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/19/16 | Oscar Ochoa | 20.83 | 27.08 | 52.00 | 16.00 | |
| 12/20/16 | Oscar Ochoa | 22.44 | 29.17 | 52.00 | | |
| 12/20/16 | Oscar Ochoa | 23.11 | 30.04 | 56.00 | | |
| 12/20/16 | Oscar Ochoa | 22.20 | 28.86 | 56.00 | 40.00 | |
| 12/21/16 | Mike Bayne | 22.15 | 28.80 | 56.00 | | |
| 12/21/16 | Mike Bayne | 22.67 | 29.47 | 56.00 | | |
| 12/21/16 | Mike Bayne | 23.13 | 30.07 | 56.00 | 56.00 | |
| 12/22/16 | Mike Bayne | 22.25 | 28.93 | 56.00 | 28.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 178.78 | 232.41 | 440.00 | 140.00 | 0.00 |
| | | | | | | |
| | | | | | | |
| Windrow Construction ratio: | | 2.50 /1 | | | | |
| | | | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

MSAP Process Temperature Chart Windrow# 16-12-22

Temperature: Shading equals temperature 131 or greater for PFRP.

| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
|------|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/23/16 | 148 | 122 | 115 | 101 | 144 | 122 | 120 | 115 | 132 | 138 | 122 | 120 | 150 | 152 | 130 | 118 | 143.5 | 133.5 | 121.75 | 113.5 | |
| 2 | 12/24/16 | 149 | 140 | 132 | 121 | 150 | 142 | 128 | 124 | 156 | 148 | 130 | 126 | 158 | 156 | 134 | 123 | 153.25 | 146.5 | 131 | 123.5 | |
| 3 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 4 | 12/26/16 | 150 | 151 | 138 | 133 | 151 | 158 | 142 | 132 | 162 | 150 | 132 | 128 | 161 | 158 | 138 | 128 | 156 | 154.25 | 137.5 | 130.25 | |
| 5 | 12/27/16 | 165 | 155 | 142 | 132 | 150 | 147 | 138 | 135 | 169 | 150 | 131 | 134 | 160 | 150 | 132 | 131 | 161 | 150.5 | 135.75 | 133 | |
| 6 | 12/28/16 | 163 | 160 | 144 | 134 | 154 | 157 | 144 | 136 | 164 | 158 | 137 | 136 | 160 | 156 | 140 | 132 | 160.25 | 157.75 | 141.25 | 134.5 | |
| 7 | 12/29/16 | 141 | 161 | 160 | 136 | 142 | 158 | 161 | 136 | 162 | 163 | 152 | 142 | 160 | 158 | 140 | 132 | 151.25 | 160 | 153.25 | 136.5 | |
| 8 | 12/30/16 | 150 | 154 | 150 | 137 | 154 | 150 | 144 | 135 | 160 | 160 | 153 | 144 | 155 | 160 | 148 | 138 | 154.75 | 156 | 148.75 | 138.5 | |
| 9 | 12/31/16 | 150 | 150 | 140 | 136 | 150 | 150 | 142 | 136 | 160 | 159 | 140 | 132 | 155 | 160 | 150 | 132 | 153.75 | 154.75 | 143 | 134 | |

Attachment E

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 16-12-24 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-22-16 | | Date Completed: 12-24-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/22/16 | Mike Bayne | 22.42 | 29.15 | 60.00 | | |
| 12/22/16 | Mike Bayne | 22.09 | 28.72 | 60.00 | 40.00 | |
| 12/23/16 | Oscar Ochoa | 20.79 | 27.03 | 52.00 | | |
| 12/23/16 | Jerry Devoe | 22.38 | 29.09 | 56.00 | | |
| 12/23/16 | Jerry Devoe | 22.65 | 29.45 | 56.00 | 40.00 | |
| 12/24/16 | Oscar Ochoa | 22.65 | 29.45 | 52.00 | | |
| 12/24/16 | Oscar Ochoa | 22.28 | 28.96 | 52.00 | | |
| 12/24/16 | Jerry Devoe | 22.59 | 29.37 | 56.00 | 44.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 177.85 | 231.21 | 444.00 | 124.00 | 0.00 |
| | | | | | | |
| | | | | | | |
| Windrow Construction ratio: | | 2.46 /1 | | | | |
| | | | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

MSAP Process Temperature Chart Windrow# 16-12-24

Temperature: Shading equals temperature 131 or greater for PFRP.

| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
|------|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 12/26/16 | 132 | 122 | 116 | 108 | 138 | 128 | 115 | 108 | 142 | 128 | 122 | 115 | 150 | 142 | 132 | 125 | 140.5 | 130 | 121.25 | 114 | |
| 3 | 12/27/16 | 149 | 138 | 121 | 118 | 157 | 146 | 132 | 124 | 166 | 154 | 137 | 126 | 167 | 155 | 134 | 128 | 159.75 | 148.25 | 131 | 124 | |
| 4 | 12/28/16 | 154 | 146 | 123 | 124 | 158 | 154 | 138 | 118 | 154 | 147 | 122 | 105 | 162 | 168 | 144 | 131 | 157 | 153.75 | 131.75 | 119.5 | |
| 5 | 12/29/16 | 160 | 158 | 140 | 130 | 156 | 158 | 151 | 144 | 150 | 152 | 141 | 131 | 158 | 161 | 158 | 143 | 156 | 157.25 | 147.5 | 137 | |
| 6 | 12/30/16 | 160 | 152 | 144 | 135 | 150 | 160 | 160 | 155 | 150 | 145 | 137 | 131 | 147 | 150 | 140 | 136 | 151.75 | 151.75 | 145.25 | 139.25 | |
| 7 | 12/31/16 | 158 | 142 | 132 | 138 | 150 | 159 | 160 | 155 | 150 | 143 | 132 | 132 | 143 | 149 | 139 | 132 | 150.25 | 148.25 | 140.75 | 139.25 | |

Attachment F

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 16-12-28 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-26-16 | | Date Completed: 12-28-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/26/16 | Oscar Ochoa | 22.26 | 28.94 | 56.00 | | |
| 12/26/16 | Oscar Ochoa | 22.28 | 28.96 | 52.00 | 32.00 | |
| 12/27/16 | Oscar Ochoa | 22.59 | 29.37 | 56.00 | | |
| 12/27/16 | Oscar Ochoa | 23.07 | 29.99 | 52.00 | | |
| 12/27/16 | Oscar Ochoa | 22.04 | 28.65 | 56.00 | 48.00 | |
| 12/28/16 | Jerry Devoe | 22.24 | 28.91 | 56.00 | | |
| 12/28/16 | Jerry Devoe | 20.88 | 27.14 | 56.00 | | |
| 12/28/16 | Jerry Devoe | 22.66 | 29.46 | 56.00 | 48.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 178.02 | 231.43 | 440.00 | 128.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.45 /1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 16-12-28 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|-------|------|
| Temperature: Shading equals temperature 131 or greater for PFRP. | | | | | | | | | | | | | | | | | | | | | | |
| Days | Date | Point 1 | | | | Point 2 | | | | Point 3 | | | | Point 4 | | | | Average | | | | Turn |
| | | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10 | 20 | 30 | 40 | 10" | 20" | 30" | 40" | |
| 1 | 12/29/16 | 138 | 133 | 122 | 116 | 120 | 119 | 114 | 100 | 150 | 142 | 134 | 130 | 118 | 115 | 101 | 100 | 131.5 | 127.25 | 117.75 | 111.5 | |
| 2 | 12/30/16 | 160 | 145 | 136 | 127 | 160 | 142 | 137 | 127 | 150 | 153 | 150 | 141 | 150 | 140 | 122 | 115 | 155 | 145 | 136.25 | 127.5 | |
| 3 | 12/31/16 | 160 | 144 | 132 | 127 | 160 | 142 | 132 | 127 | 150 | 155 | 150 | 146 | 145 | 139 | 122 | 118 | 153.75 | 145 | 134 | 129.5 | |

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 16-12-31 | |
|---|---------------|------------------|--------------------------|--------------------|--------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-28-16 | | Date Completed: 12-31-16 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/29/16 | Jerry Devoe | 22.71 | 29.52 | 56.00 | | |
| 12/29/16 | Jerry Devoe | 22.55 | 29.32 | 56.00 | | |
| 12/29/16 | Jerry Devoe | 22.23 | 28.90 | 56.00 | 44.00 | |
| 12/30/16 | Oscar Ochoa | 22.53 | 29.29 | 52.00 | | |
| 12/30/16 | Jerry Devoe | 22.31 | 29.00 | 56.00 | | |
| 12/30/16 | Jerry Devoe | 22.58 | 29.35 | 56.00 | 44.00 | |
| 12/31/16 | Jerry Devoe | 21.88 | 28.44 | 52.00 | | |
| 12/31/16 | Jerry Devoe | 22.32 | 29.02 | 52.00 | 44.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 179.11 | 232.84 | 436.00 | 132.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.44 /1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |