

3. EMISSIONS QUANTIFICATION

The Adel Facility has emissions of CO, NO_x, filterable PM, total PM₁₀, total PM_{2.5}, sulfur dioxide (SO₂), VOC, greenhouse gases (GHGs) in the form of carbon dioxide equivalent (CO_{2e}), and HAP. Detailed emissions calculations for the facility are included in Appendix C.

3.1 Whole Log and Green Chips Processing

The wood handling, storage, debarking, and wood chipping operations are sources of fugitive filterable PM/PM₁₀/PM_{2.5} emissions. Emission rates of these processing operations are estimated based on the drop point equation in AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles* (September 2006). Fugitive dust from the drop and transfer operations that are not confined in an enclosure and are not equipped with a dust control system (i.e., baghouse) are estimated based on maximum throughput rates, and the methodology outlined in AP 42 Section 13.2.4, Equation 1:

$$PM \text{ Emissions } \left(\frac{lb}{ton} \right) = k \times 0.0032 \times \left(\frac{U}{5} \right)^{1.3} \div \left(\frac{M}{2} \right)^{1.4}$$

Where:

- k = particle size multiplier, obtained from AP-42 Section 13.2.4.4
- M = material moisture content, based on facility design basis
- U = mean wind speed, mph, based on site measurements

As the site is designed to receive both whole logs and green residuals for pelletizing, emissions are quantified for both scenarios assuming an annual throughput of 497,000 tons of finished pellets per year at 7% moisture content. Annual throughputs of whole logs and green residuals are 1,100,000 tons of whole logs and 435,000 green tons, respectively, based on equipment sizing. As these sources are not combustion sources, condensable PM is negligible. Therefore, filterable PM/PM₁₀/PM_{2.5} is equal to total PM/PM₁₀/PM_{2.5}.

3.2 Green Hammermill

The green hammermilling operations are sources of filterable PM/PM₁₀/PM_{2.5}, VOC, and organic HAP emissions. Filterable PM/PM₁₀/PM_{2.5} emissions from the green hammermill are controlled by a dust collector. Filterable PM/PM₁₀/PM_{2.5} emissions are calculated using an exit grain loading rate methodology based on vendor estimates for the control devices. This emissions calculation method uses the exhaust air flow rate and estimated mass concentration as opposed to control device efficiency. As these sources are not combustion sources, condensable PM is negligible. Therefore, filterable PM/PM₁₀/PM_{2.5} is equal to total PM/PM₁₀/PM_{2.5}.

The uncontrolled VOC emission rate is based on historical site-specific stack testing of the (former) Westervelt Aliceville facility wet classisizers, which were controlled with an RTO at that facility, taking into account a presumed 95% control efficiency for RTO control and back-calculating an uncontrolled emission factor, and adding a 10% safety factor for conservatism. The formaldehyde, acetaldehyde, and methanol emission rates are from Georgia EPD guidance for hammermills at wood pellets manufacturing facilities. Acrolein and propionaldehyde emission rates are based on historical site-specific stack testing of the Enviva Pellets Sampson (NC) dry hammermill. The phenol emission rate is based on the emission factor from AP-42 Section 10.6.2, Table 10.6.2-7 for a hammermill. Green hammermill emissions are then routed to the RCO