# KEMPER COUNTY, MS

**Bioeconomy Development Opportunity Zone**

# RATING GRADE: 'A'

**Date of Issue: February 19, 2025**

**A**
**High Quality**

## Rating Parameters:

| Category | Rated Quantity | Delivered Price | BDO Zone Size |
|---|---|---|---|
| Pulpwood | 800,000 bdt/yr | $50-$70/bdt | 75-mi drive distance |
| Forest residue | 185,000 bdt/yr | $50-$70/bdt | from Scooba, MS |
| Sawmill residue | 120,000 bdt/yr | $40-$80/bdt | |

## BDO ZONE ASSETS

- Leading regional forest industry with large network of experienced suppliers.
- Nationally competitive supply chain labor costs.
- Underutilized pine forest resource.
- Comprehensive transport infrastructure, including dense road network, rail access, and proximity to a major waterway providing access to the Gulf Coast.

## BDO ZONE LIABILITIES

- Wood processing facility with demand for pulpwood under construction in vicinity of Scooba.
- Investments in logging and trucking workforce development required.
- Procurement of specialized labor challenging due to remoteness of region.

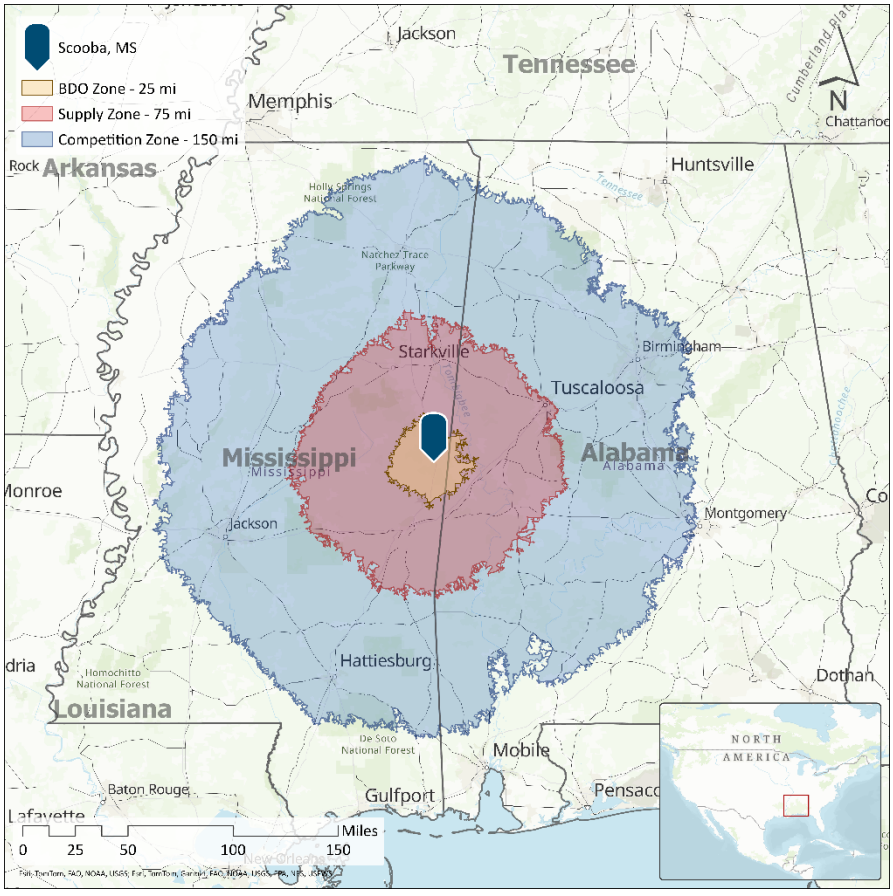
## RATING GRADE

**The Kemper County, MS, Bioeconomy Development Opportunity Zone, is rated 'A', or 'low' risk.**

Risk Rating Grades are defined as follows: AAA (extremely low), AA (very low), A (low), BBB (low-moderate), BB (moderate), B (moderate-high), and C (high).

'A' ratings denote high prospective viability of Feedstock Supply and Infrastructure and low expectations of default risk in the Zone. Capacity to support new biobased plant operations is considered strong. This capacity may, nevertheless, be more vulnerable to feedstock supply costs, transportation capacity issues, and specialized workforce availability than is the case for higher ratings.

## KEMPER COUNTY, MS BDO ZONE



## ANALYST NOTES

The Kemper County, MS BDO Zone spans east-central Mississippi and west-central Alabama. Forests cover 75% of the land area in the region and are comprised of pure softwood (lobolly pine), pure hardwood (maple-oak-poplar), and mixedwood stands. Regional forest industry capacity has consistently increased over the past decade. The over 38 wood processing facilities currently operating within a 150-mile drive distance of Scooba, MS are supported by a large network of experienced logging professionals.

A total of 1,105,000 bdt/yr of wood fiber is estimated to be available for new projects within a 75-mile drive distance of Scooba at low risk. This includes 800,000 bdt/yr of pine pulpwood, 185,000 bdt/yr of forest residue, and 120,000 bdt/yr of sawmill residue. The average delivered price is expected to range from $50 to $70/bdt for pulpwood and forest residue. The delivered price of sawmill residue is expected to range from $40 to $80/bdt, including $40 to $60/bdt for bark/hog fuel and $60 to $80/bdt for wood chips and sawdust. A description of the methods used to estimate the rated quantities and prices is presented in Section B.

Risks relevant to the rated quantities and prices were assessed using 88 Risk Indicators from the US Standards for Biomass Supply Chain Risk (BSCR). Details of the risk assessment are presented in Section C. The following is a summary of the most significant assets and liabilities of the BDO Zone, as inferred from the risk assessment.

### BDO ZONE ASSETS

The capacity of wood processing facilities in the region has expanded over the past decade, leading to continued supply chain workforce development. At the same time, demand for pine pulpwood has declined significantly. Although recruitment of equipment operators and procurement of additional equipment will likely be required to ensure timely deliveries of the rated quantities, the overall health of the regional forest industry is an asset. Long-term industry viability is supported by nationally competitive labor costs.

The regional pine forest resource is large and underutilized. Thinning treatments and final removals in pine plantations are not occurring at the rate required to optimize growth, yield, and landowner returns. A new facility willing to pay the rated price range would incent increased thinning and harvesting activity, ensuring a steady supply of pine pulpwood.

Transportation infrastructure also represents a significant asset for the BDO Zone. The evaluated site is located adjacent to a major state highway and railroad and is 30 miles from the Tombigbee Waterway. The Waterway provides efficient access to international shipping and receiving from Gulf Coast ports.

### BDO ZONE LIABILITIES

Construction of a new OSB facility in Shuqualak, MS, with a potential demand of one million bdt/yr of pine pulpwood began in 2023. Operations are expected to commence in early 2026. A new project located near Scooba would be in direct competition with this facility, as it is located only 15 miles away and is more favorably positioned in relation to pine pulpwood resources. Although the rated quantity and pricing was determined after accounting for the demands of this facility, competition risks are elevated.

There is also uncertainty in regional logging and trucking capacity. Despite the continued growth of biobased industries in the region, workforce attrition has continued to occur in Alabama and Mississippi. In particular, inadequate logging truck capacity was noted during outreach, similar to previous BDO Zone ratings issued for Grenada County, MS and Conecuh County, AL. Overall risks associated with labor availability are assessed as medium-to-high after accounting for the mitigating effects of the network of institutions in Alabama and Mississippi that encourage forestry workforce development.

### INFRASTRUCTURE PROFILE

The 34-acre Kemper County site has excellent connectivity to regional transportation infrastructure. The site is located in proximity to Kansas City Southern (KCS) rail service and Highway 45, a key four-lane corridor. Water freight access to ports on the Gulf Coast is enabled by the Tombigbee Waterway, located within a 35-mile drive distance from Scooba.

To support industrial operations, the site has received extensive utility infrastructure investments. Electric

service upgrades to 160kV will enhance reliability and meet the demands of energy-intensive operations. New natural gas feeder lines are under construction. Kemper County is also proactively expanding water availability within the industrial park.

Retaining a skilled workforce to support a new bio-project could be challenging. The nearest large cities (Jackson, MS and Birmingham, AL) are located over 120 miles from Scooba, potentially confounding recruitment of workers. Marginal local healthcare and educational resources may also encumber workforce recruitment. However, there are also elements of local infrastructure that would likely contribute to workforce attraction, including lower housing costs and cost of living.

## SCORING & RATING METHODOLOGY

In assessing the biomass supply chain risk for the Bioeconomy Development Opportunity (BDO) Zone, 88 Risk Indicators from the US Standards for Biomass Supply Chain Risk (BSCR) were applied. These BDO Zone Risk Indicators are the subset of BSCR Risk Indicators applicable to evaluating feedstock risk within a BDO Zone.

Feedstock quantities are expressed in bone dry tons per year (bdt/yr), while feedstock costs and prices are expressed in United States dollars (USD). The rated price range is based on a 50- to 75-mile drive distance from the center point (Scooba, MS).

The BDO Zone rating is based on an aggregation of the scores assigned to each BDO Zone Risk Indicator (RI) assessed in this report. First, each BDO Zone Risk Indicator is given a **Raw Risk Likelihood (RRL)** score, which denotes the likelihood of a risk to future BDO Zone projects due to the Risk Indicator. RRL Scores are scaled as either very low (2), low (4), medium (6), high (8), or very high (10).

Each BDO Zone Risk Indicator is given a **Raw Risk Impact (RRI)** score, which denotes the impact on a future BDO Zone project due to the Risk Indicator. RRI scores are scaled as either very low (2), low (4), medium (6), high (8), or very high (10). Impact level scores are based on the impact level of a risk on the successful development and deployment of a BDO Zone project with no mitigation measures.

The **Gross Risk Indicator (GRI)** score is then calculated as the product of the RRL and the RRI scores. For example, if the 'Competitor Price and Price Sensitivity' is scored at an RRL of 2 and an RRI of 8, then the GRI for this risk indicator is 2 X 8 = 16.

If the analyst deems that a typical bio-based project could implement economically reasonable measures or best practices that mitigate the likelihood (RRL), the impact (RRI), or both, then the GRI will be notched accordingly.

The **Loaded RI** score for each Risk Indicator is the product of the GRI score and any notched scores. Loaded RIs are the final score for a Risk Indicator.

Loaded RI scores of 4 or less are deemed very low risk; scores between 5 and 16 are deemed low risk; scores between 17 and 36 are deemed medium risk; scores between 37 and 64 are deemed high risk; and scores of 65 and greater are deemed very high risk.

The total risk rating for the BDO Zone is the average of all Loaded RI scores and Infrastructure Indicators. The BDO Zone score for Kemper County, MS is ***19.95 out of 100, resulting in an 'A' designation.***

All scoring and rationale for each Risk Indicator are provided in Section D.

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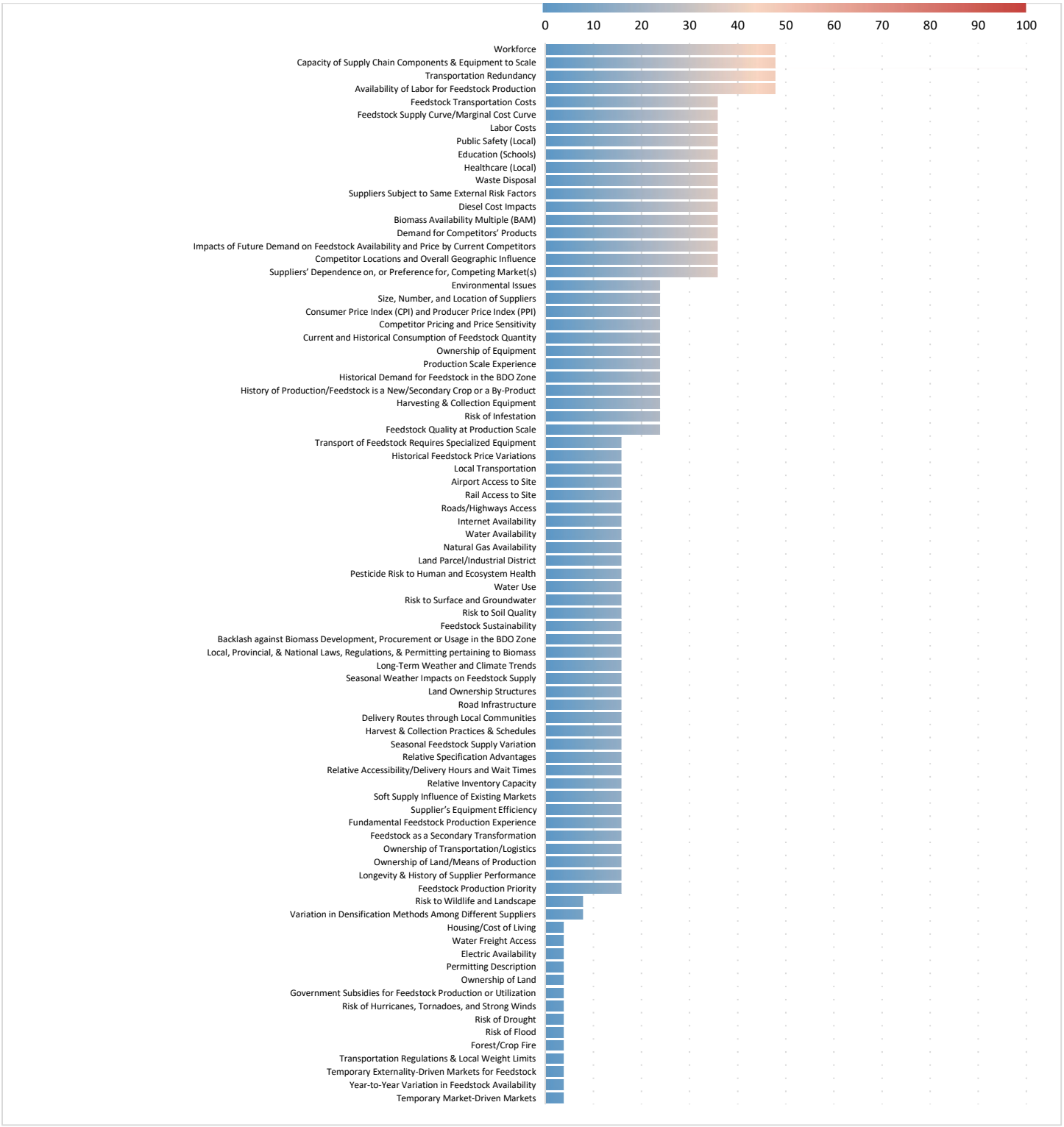
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## SECTION A: RISK INDICATOR SUMMARY

### Figure A-1. All Risk Indicators Sorted by Risk Level



## Table A-1. Risk Indicators and Associated Scores

| Feedstock Supply Chain Risk Indicators | Raw Risk Likelihood | Raw Risk Impact | Gross Risk Indicator | Mitigation /Notching | Loaded RI Score |
|---|---|---|---|---|---|
| **Category 1.0: Supplier Risk** | | | | | |
| *1.1 Risk Factor: Credit-Worthiness/Future Solvency of Suppliers* | | | | | |
| 1.1.1 Longevity & History of Supplier Performance | 4 | 4 | 16 | NN | 16 |
| *1.2 Risk Factor: Conflicts of Interest/Vested Interest with Competing Market(s)* | | | | | |
| 1.2.1 Suppliers' Dependence on, or Preference for, Competing Market(s) | 6 | 6 | 36 | NN | 36 |
| *1.3 Risk Factor: Supplier Control Over Production and Transportation* | | | | | |
| 1.3.1 Ownership of Land/Means of Production | 4 | 4 | 16 | NN | 16 |
| 1.3.2 Ownership of Equipment | 6 | 4 | 24 | NN | 24 |
| 1.3.3 Ownership of Transportation/Logistics | 4 | 4 | 16 | NN | 16 |
| 1.3.4 Feedstock as a Secondary Transformation | 4 | 4 | 16 | NN | 16 |
| *1.4 Risk Factor: Supplier Experience* | | | | | |
| 1.4.1 Fundamental Feedstock Production Experience | 4 | 4 | 16 | NN | 16 |
| 1.4.2 Production Scale Experience | 6 | 4 | 24 | NN | 24 |
| *1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity* | | | | | |
| 1.5.1 Supplier's Equipment Efficiency | 4 | 4 | 16 | NN | 16 |
| *1.6 Risk Factor: Supplier Motivation* | | | | | |
| 1.6.1 Feedstock Production Priority | 4 | 4 | 16 | NN | 16 |
| **Category 2.0: Competitor Risk** | | | | | |
| *2.1 Risk Factor: Influence on Feedstock Supply of Existing Markets* | | | | | |
| 2.1.1 Competitor Locations and Overall Geographic Influence | 6 | 6 | 36 | NN | 36 |
| 2.1.2 Current and Historical Consumption of Feedstock Quantity | 4 | 6 | 24 | NN | 24 |
| 2.1.3 Competitor Pricing and Price Sensitivity | 4 | 6 | 24 | NN | 24 |
| 2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors | 6 | 6 | 36 | NN | 36 |
| 2.1.5 Soft Supply Influence of Existing Markets | 4 | 4 | 16 | NN | 16 |
| 2.1.6 Temporary Market-Driven Markets | 2 | 2 | 4 | NN | 4 |
| *2.2 Risk Factor: Specific Competitors' Competitive Advantage* | | | | | |
| 2.2.1 Relative Inventory Capacity | 4 | 4 | 16 | NN | 16 |
| 2.2.2 Relative Accessibility/Delivery Hours and Wait Times | 4 | 4 | 16 | NN | 16 |
| 2.2.3 Relative Specification Advantages | 4 | 4 | 16 | NN | 16 |
| 2.2.4 Demand for Competitors' Products | 6 | 6 | 36 | NN | 36 |
| **Category 3.0: Supply Chain Risk** | | | | | |
| *3.1 Risk Factor: Feedstock Availability* | | | | | |
| 3.1.1 Biomass Availability Multiple (BAM) | 6 | 6 | 36 | NN | 36 |
| 3.1.2 Feedstock Supply Curve/Marginal Cost Curve | 6 | 6 | 36 | NN | 36 |
| 3.1.3 Seasonal Feedstock Supply Variation | 4 | 4 | 16 | NN | 16 |
| 3.1.4 Year-to-Year Variation in Feedstock Availability | 2 | 2 | 4 | NN | 4 |
| *3.2 Risk Factor: Historical Issues* | | | | | |
| 3.2.1 Historical Feedstock Price Variations | 4 | 4 | 16 | NN | 16 |
| 3.2.2 Historical Demand for Feedstock in the BDO Zone | 6 | 4 | 24 | NN | 24 |
| 3.2.3 History of Production/Feedstock is a New/Secondary Crop or a By-Product | 6 | 4 | 24 | NN | 24 |
| *3.3 Risk Factor: Non-Weather Based Externalities* | | | | | |
| 3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI) | 6 | 4 | 24 | NN | 24 |
| 3.3.2 Currency Risk | NR | NR | NR | NR | NR |
| 3.3.3 Border Risk | NR | NR | NR | NR | NR |
| 3.3.4 Temporary Externality-Driven Markets for Feedstock | 2 | 2 | 4 | NN | 4 |
| *3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection* | | | | | |
| 3.4.1 Harvest & Collection Practices & Schedules | 4 | 4 | 16 | NN | 16 |
| 3.4.2 Harvesting & Collection Equipment | 6 | 4 | 24 | NN | 24 |
| 3.4.3 Variation in Densification Methods Among Different Suppliers | 2 | 4 | 8 | NN | 8 |
| 3.4.4 Availability of Labor for Feedstock Production | 6 | 8 | 48 | NN | 48 |
| *3.5 Risk Factor: Transportation* | | | | | |
| 3.5.1 Feedstock Transportation Costs | 6 | 6 | 36 | NN | 36 |
| 3.5.2 Diesel Cost Impacts | 6 | 6 | 36 | NN | 36 |
| 3.5.3 Transport of Feedstock Requires Specialized Equipment | 4 | 4 | 16 | NN | 16 |
| 3.5.4 Delivery Routes through Local Communities | 4 | 4 | 16 | NN | 16 |
| 3.5.5 Transportation Regulations & Local Weight Limits | 2 | 2 | 4 | NN | 4 |
| 3.5.6 Road Infrastructure | 4 | 4 | 16 | NN | 16 |
| 3.5.7 Transportation Redundancy | 8 | 8 | 64 | 25% | 48 |

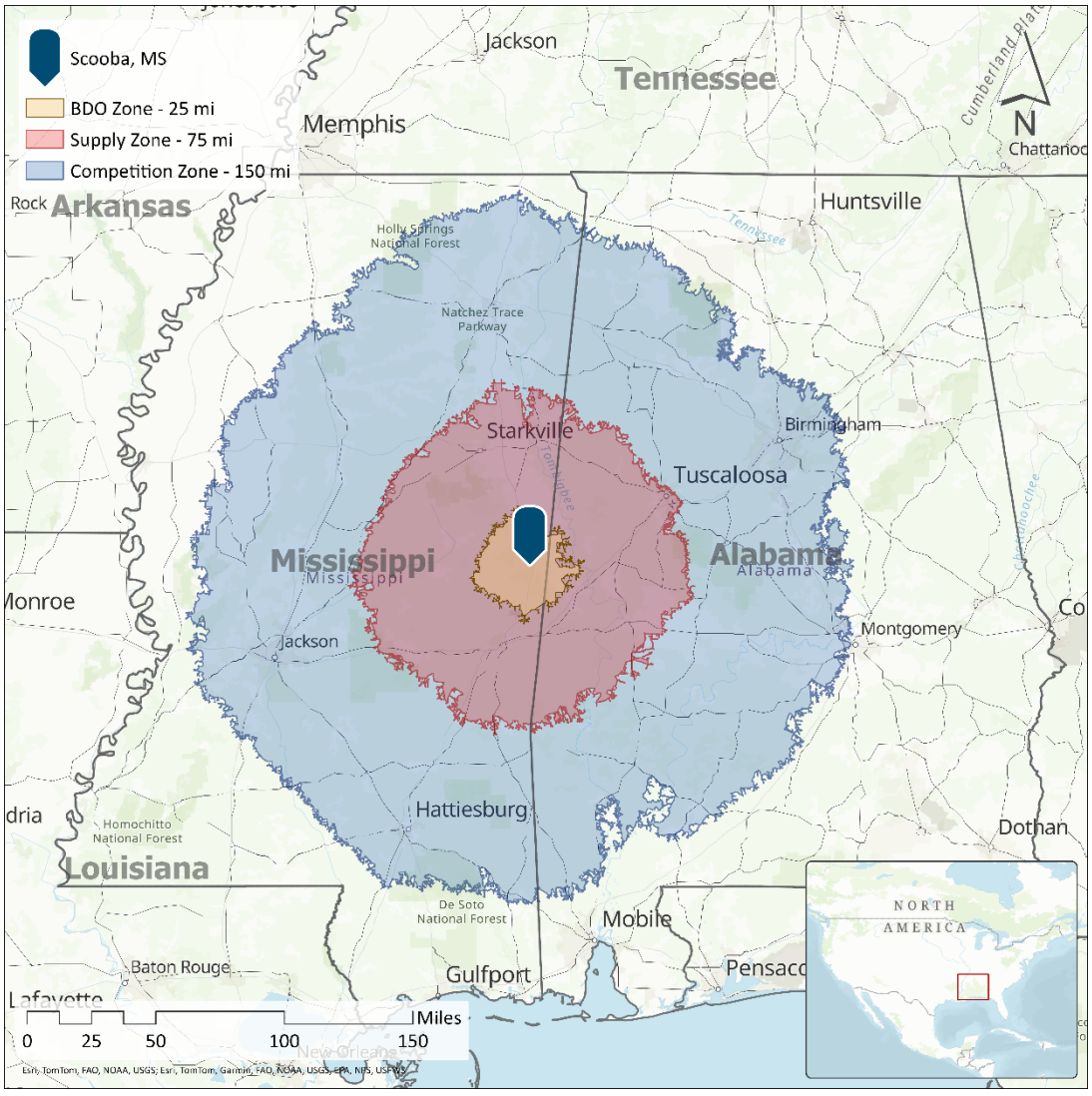
| | | | | | |
|---|---|---|---|---|---|
| ***3.6 Risk Factor: Supply Chain Resiliency*** | | | | | |
| 3.6.1 Size, Number, and Location of Suppliers | 6 | 4 | 24 | NN | 24 |
| 3.6.2 Suppliers Subject to Same External Risk Factors | 6 | 6 | 36 | NN | 36 |
| 3.6.3 Land Ownership Structures | 4 | 4 | 16 | NN | 16 |
| ***3.7 Risk Factor: Climate and Natural Risks*** | | | | | |
| 3.7.1 Seasonal Weather Impacts on Feedstock Supply | 4 | 4 | 16 | NN | 16 |
| 3.7.2 Long-Term Weather and Climate Trends | 4 | 4 | 16 | NN | 16 |
| 3.7.3 Forest/Crop Fire | 2 | 2 | 4 | NN | 4 |
| 3.7.4 Risk of Infestation | 6 | 4 | 24 | NN | 24 |
| 3.7.5 Risk of Hail | NR | NR | NR | NR | NR |
| 3.7.6 Risk of Flood | 2 | 2 | 4 | NN | 4 |
| 3.7.7 Risk of Drought | 2 | 2 | 4 | NN | 4 |
| 3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds | 2 | 2 | 4 | NN | 4 |
| 3.7.9 Risk of Low Temperatures | NR | NR | NR | NR | NR |
| ***3.8 Risk Factor: Political and Social*** | | | | | |
| 3.8.1 Government Subsidies for Feedstock Production or Utilization | 2 | 2 | 4 | NN | 4 |
| 3.8.2 Local, Provincial, & National Laws, Regulations, & Permitting pertaining to Biomass | 4 | 4 | 16 | NN | 16 |
| 3.8.3 Backlash against Biomass Development, Procurement, or Usage in the BDO Zone | 4 | 4 | 16 | NN | 16 |
| 3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations | NR | NR | NR | NR | NR |
| 3.8.5 Food Security Concerns | NR | NR | NR | NR | NR |
| ***3.9 Risk Factor: Sustainability and Environmental Concern*** | | | | | |
| 3.9.1 Feedstock Sustainability | 4 | 4 | 16 | NN | 16 |
| 3.9.2 Risk to Soil Quality | 4 | 4 | 16 | NN | 16 |
| 3.9.3 Risk to Surface and Groundwater | 4 | 4 | 16 | NN | 16 |
| 3.9.4 Water Use | 4 | 4 | 16 | NN | 16 |
| 3.9.5 Pesticide Risk to Human and Ecosystem Health | 4 | 4 | 16 | NN | 16 |
| 3.9.6 Risk to Wildlife and Landscape | 4 | 2 | 8 | NN | 8 |
| 3.9.7 Biomass Classified as Genetically Modified Organism (GMO) | NR | NR | NR | NR | NR |
| **Category 4.0: Feedstock Scale-up Risk** | | | | | |
| ***4.1 Risk Factor: Feedstock Scale-Up*** | | | | | |
| 4.1.1 Feedstock Quality at Production Scale | 6 | 4 | 24 | NN | 24 |
| 4.1.2 Capacity of Supply Chain Components & Equipment to Scale | 8 | 8 | 64 | 25% | 48 |
| **Category 5.0: Infrastructure** | | | | | |
| ***5.1 Risk Factor: Physical Infrastructure*** | | | | | |
| 5.1.1 Land Parcel/Industrial District | 4 | 4 | 16 | NN | 16 |
| 5.1.2 Ownership of Land | 2 | 2 | 4 | NN | 4 |
| 5.1.3 Permitting Description | 2 | 2 | 4 | NN | 4 |
| 5.1.4 Environmental Issues | 4 | 6 | 24 | NN | 24 |
| ***5.2 Risk Factor: Utilities*** | | | | | |
| 5.2.1 Natural Gas Availability | 4 | 4 | 16 | NN | 16 |
| 5.2.2 Electric Availability | 2 | 2 | 4 | NN | 4 |
| 5.2.3 Water Availability | 4 | 4 | 16 | NN | 16 |
| 5.2.4 Waste Disposal | 6 | 6 | 36 | NN | 36 |
| 5.2.5 Internet Availability | 4 | 4 | 16 | NN | 16 |
| ***5.3 Risk Factor: Transportation/Logistics*** | | | | | |
| 5.3.1 Roads/Highways Access | 4 | 4 | 16 | NN | 16 |
| 5.3.2 Rail Access to Site | 4 | 4 | 16 | NN | 16 |
| 5.3.3 Airport Access to Site | 4 | 4 | 16 | NN | 16 |
| 5.3.4 Water Freight Access | 2 | 2 | 4 | NN | 4 |
| ***5.4 Risk Factor: Social Infrastructure*** | | | | | |
| 5.4.1 Healthcare (Local) | 6 | 6 | 36 | NN | 36 |
| 5.4.2 Education (Schools) | 6 | 6 | 36 | NN | 36 |
| 5.4.3 Local Transportation | 4 | 4 | 16 | NN | 16 |
| 5.4.4 Public Safety (Local) | 6 | 6 | 36 | NN | 36 |
| 5.4.5 Housing/Cost of Living | 2 | 2 | 4 | NN | 4 |
| ***5.5 Risk Factor: Labor*** | | | | | |
| 5.5.1 Workforce | 8 | 6 | 48 | NN | 48 |
| 5.5.2 Labor Costs | 6 | 6 | 36 | NN | 36 |
| | | | | ***Average*** | **19.95** |

# SECTION B: BIOMASS AVAILABILITY AND PRICING

## OVERVIEW

BDO Zone Risk Indicators are scored with reference to specific feedstock quantities and prices. The rated quantities are determined by first estimating the potential amount of biomass feedstock that can be produced within the Supply Zone, defined by a 75-mile drive distance from Scooba, MS (Map B-1). Biomass availability for new bio-projects is then estimated by subtracting the current demand for the rated feedstock types in the Competition Zone (150-mile drive distance from Scooba, MS) from the estimate of total potential production. The rated quantity is then determined by dividing the availability estimate by a Biomass Availability Multiple (BAM) of between 1.5 and 4.0. The BAM is applied to account for uncertainty in underlying data, models, assumptions, and future operating conditions. The resulting rated feedstock quantities are conservative estimates of biomass availability for new projects. The price range associated with each rated quantity is determined through outreach and market analysis in the Competition Zone and reflects the anticipated price that a new bio-project would have to pay to secure the rated quantity of biomass.

**Map B-1. Map of BDO Zone, Supply Zone, and Competition Zone**



## EVALUATED FEEDSTOCKS

**Pulpwood:** Roundwood derived from trees between 5-11 inches in diameter that cannot be milled into solid wood products due to small diameter, irregular form, or other defect. Also referred to as low grade roundwood.

**Forest residue:** Branches and the top section of stems that are recovered during forest operations but that cannot be sectioned into roundwood. Recovery of forest residue typically requires the use of mobile chippers or grinders capable of comminuting the material into smaller, homogenous particle sizes. Chip trucks are subsequently used to transport the material to the destination.

**Sawmill residue:** Byproducts of sawmill operations produced from the conversion of sawlogs into lumber and finished wood products. A typical lumber mill converts 40-60% of sawlogs into finished wood products. The remaining portion of sawn timber is transformed during milling into sawmill residue, including wood chips, sawdust, planer shavings, and bark.

## SUPPLY ANALYSIS

Over 90% of the timberland in the Supply Zone is privately owned. Forests are comprised of over 20 tree species groups, the most common being pine, maple, oak, and poplar. Pine-dominant softwood forests comprise 70% of the timberland in the Supply Zone. Seventeen sawmills with capacities larger than 5 MMBF/yr (average of 100 MMBF/yr) are located within a 75-mile drive distance of Scooba, in east-central Mississippi and west-central Alabama (Map B-2). The identified mills have an aggregate lumber production capacity of 1,750 MMBF/yr, producing an estimated 3.3 million bdt of sawmill residue annually, including 1.5 million bdt/yr of wood chips, 750,000 bdt/yr of sawdust, 650,000 bdt/yr of planer shavings, and 300,000 bdt/yr of hog fuel/bark (Table B-1).[1]

[1] Based on outreach and internal model.

## Map B-2. Location of Sawmills Within a 75-mile Drive Distance of Scooba

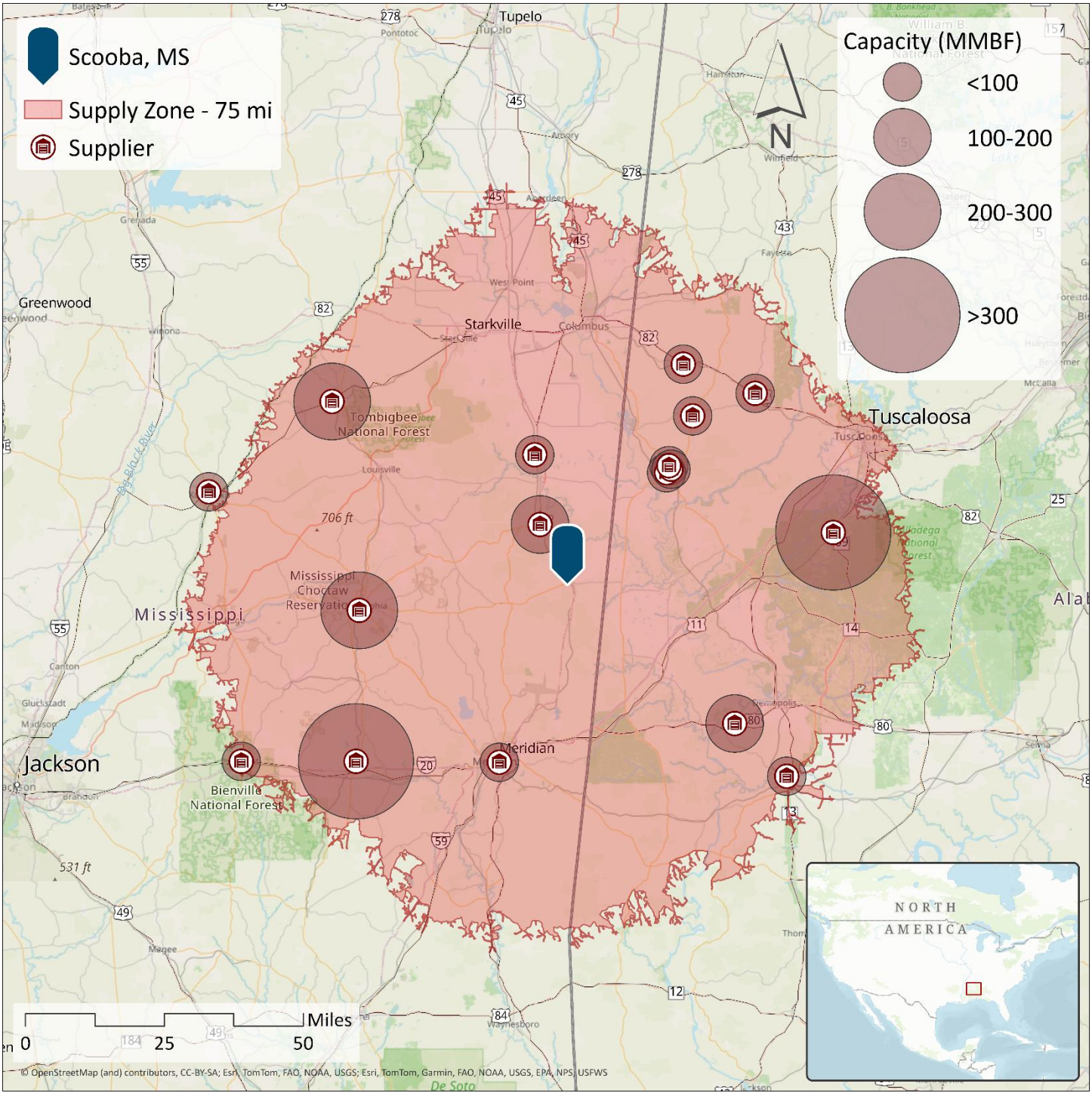
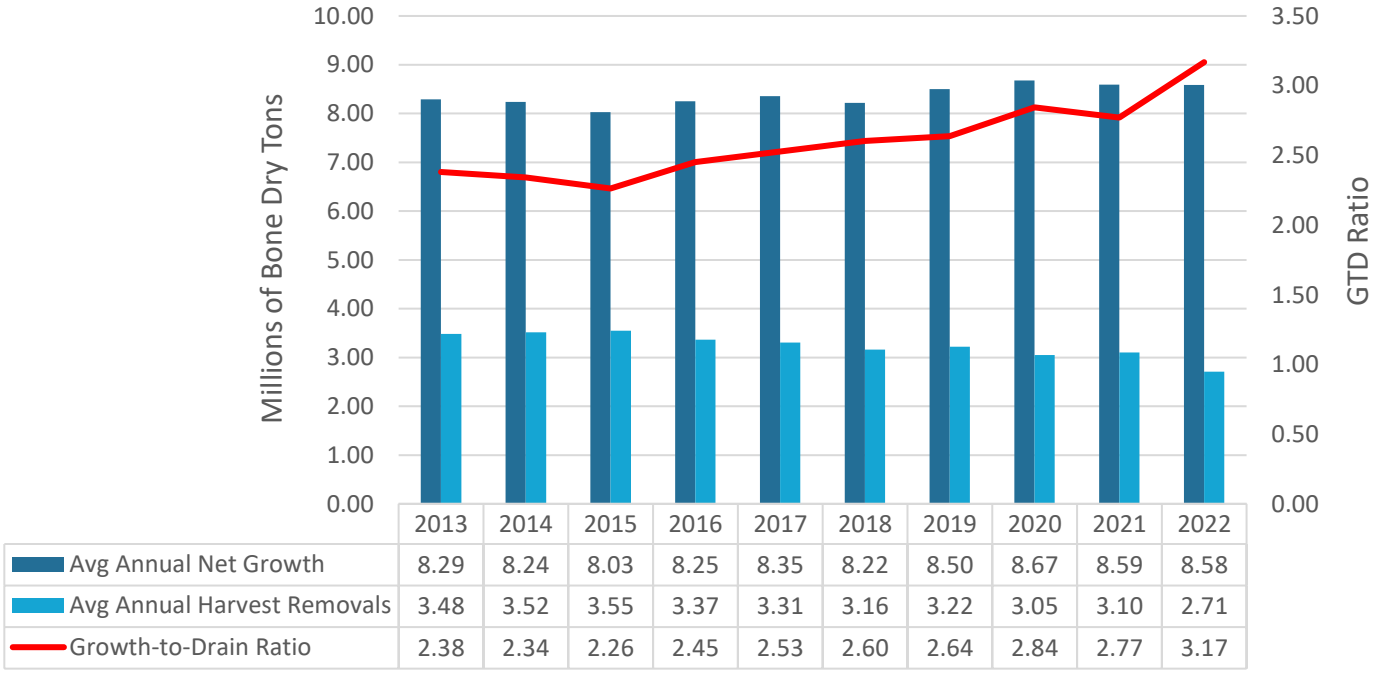


**Table B-1. Sawmill Residue Generation in the Supply Zone**

| Sawmill Residue Type | Annual Production (bdt/yr) |
|---|---|
| **Wood chips** | 1,530,000 |
| **Sawdust** | 750,000 |
| **Planer shavings** | 650,000 |
| **Hog fuel/bark** | 300,000 |
| **Total** | 3,265,000 |

Climatic and soil conditions support high levels of timber harvesting without compromising long-term resource sustainability. United State Forest Service (USFS) Forest Inventory and Analysis (FIA) data shows that over the 2013-2022 period, the growth-to-drain (GTD) ratio in the Supply Zone averaged 1.82, indicating that further removals can be accommodated without affecting long-term wood supply (Figure E-1, Section E).[2] A total of 2.7 million bdt of pulpwood was harvested from the Supply Zone in 2022. The average pulpwood removal for the 2013-2022 period was 3.2 million bdt/yr. Over this period, the GTD ratio for pulpwood did not drop below 2.25 and averaged 2.60 (Figure B-1).

**Figure B-1. Pulpwood Average Annual Net Growth, Harvesting Removals, and Growth-to-Drain Ratio**




| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|
| Avg Annual Net Growth | 8.29 | 8.24 | 8.03 | 8.25 | 8.35 | 8.22 | 8.50 | 8.67 | 8.59 | 8.58 |
| Avg Annual Harvest Removals | 3.48 | 3.52 | 3.55 | 3.37 | 3.31 | 3.16 | 3.22 | 3.05 | 3.10 | 2.71 |
| Growth-to-Drain Ratio | 2.38 | 2.34 | 2.26 | 2.45 | 2.53 | 2.60 | 2.64 | 2.84 | 2.77 | 3.17 |

The amount of pulpwood that could be available for new projects was estimated by calculating the additional pulpwood removals that could have been supported over the 2013-2022 period while maintaining an average pulpwood GTD ratio of 1.2. A total of 3.7 million bdt/yr of pulpwood is estimated to be available for new projects based on this methodology.[3] This is in addition to the approximately 2.7 million bdt/yr of pulpwood that is currently harvested in support of existing operations. Total potential pulpwood production in the Supply Zone is therefore estimated to be 6.4 million bdt/yr. USFS

[2] The growth-to-drain ratio is estimated by dividing net growth (gross growth minus natural mortality) by harvesting removals. A GTD ratio of 1.2 or greater is generally regarded as indicative of sustainable harvesting levels.

[3] FIA AHR data was corroborated using county-level estimates of pulpwood production available through the Alabama Department of Revenue (https://www.forestry.alabama.gov/Pages/Management/Forms/Forest_Resource_Report_2023.pdf, p.44).

FIA data also indicates that an average of 750,000 bdt/yr of tops and branches from trees with DBH greater than 11 inches are theoretically available as a byproduct of conventional sawtimber operations. Final estimates of total potential feedstock production within the Supply Zone are presented in Table B-2.

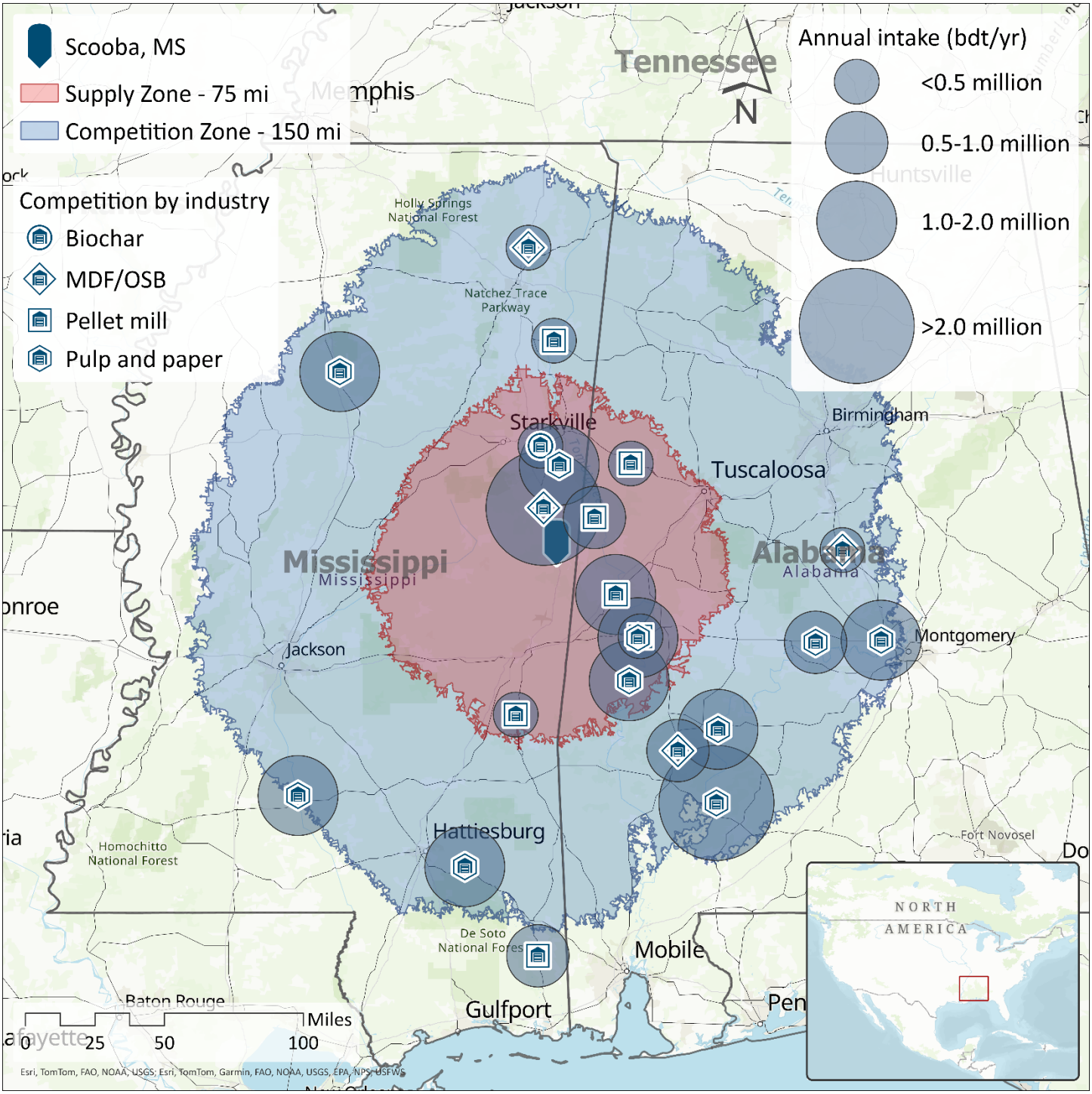
**Table B-2. Total Annual Generation of Feedstock in the Supply Zone**

| Feedstock Type | Annual Availability (bdt/yr) |
|---|---|
| **Sawmill residue** | 3,265,000 |
| **Pulpwood** | 6,400,000 |
| **Forest residue** | 750,000 |
| **Total** | 10,415,000 |

## COMPETITION ANALYSIS

There are a total of 22 facilities located within the Competition Zone (150-mile drive distance from Scooba, MS) that intake sawmill residue and/or pulpwood, including ten pulp and paper mills, eight pellet mills, three fiberboard plants, and a biochar production facility (Map B-3). Six of the pulp and paper mills and at least one sawmill also operate combined heat and power (CHP) units. The total estimated feedstock intake capacity for the identified facilities and CHP units is approximately 19 million bdt/yr. After adjusting for the overlap of each facility's theoretical procurement area with the Supply Zone, the identified facilities have an estimated feedstock intake from regional sawmills and the forests of the Supply Zone of approximately 6.5 million bdt/yr. Approximately half of this quantity (3.5 million bdt/yr) is comprised of sawmill residue sourced from the region's sawmills (including sawmills outside of the Supply Zone), and the remaining portion (3 million bdt/yr) is comprised of pulpwood sourced from forest operations that occur in the Supply Zone. This is verified by the USFS FIA pulpwood removals data, which shows an average annual removal of 3.25 million bdt/yr over the 2013-2022 period (Figure B-1).

**Map B-3. Location of Competitors Within a 150-mile Drive Distance of Scooba**



It was determined through outreach to local forestry professionals that hardwood pulpwood is unlikely to be available for new entrants, whereas pine pulpwood is in sufficient abundance to support new projects. Current competition for pine pulpwood within a 75-mile drive distance of Scooba is limited to a specialty pulp mill in Columbus, MS, and a pellet mill in Epes, AL. The Columbus mill tends to buy pine pulpwood exclusively from Weyerhaeuser timberlands, whereas the pellet mill consumes 1.1 million bdt/yr, approximately 50% of which is comprised of pine pulpwood. Purchases from other parties are inconsistent during most times of the year.

A significant increase in pine pulpwood demand is expected in the near future. A large OSB facility located in Shuqualak, MS (15 miles from Scooba) is expected to begin operations in the first quarter of 2026. The facility will consume up to 1 million bdt/yr of pine pulpwood. Some level of competition is also likely to develop as a result of the completion of a biochar production line at a steel manufacturing facility in Columbus, MS (50 miles from Scooba). The facility could consume approximately 150,000 bdt/yr of pine pulpwood and sawmill residue once operational in early 2025.

## RATED QUANTITIES AND PRICING

As discussed in the Supply Analysis subsection, FIA harvest removals data indicates that the total amount of pulpwood the could be sustainably available for new projects is approximately 3.7 million bdt/yr. Outreach to logging companies in the area confirmed that large quantities of surplus pine pulpwood are available. Pine sawtimber and pulpwood prices in Mississippi and Alabama have declined significantly in past decades.[4] Thinning operations crucial to optimal growth and yield in pine plantations have become more difficult to support given rising logging and trucking rates. A new project willing to pay the price range of $50-$70/bdt would, therefore, secure the vast majority of pine pulpwood that is available in the Supply Zone (after accounting for the future demands of the OSB facility in Shuqualak, MS).

The rated quantity of pulpwood was estimated by first multiplying the available pulpwood estimate of 3.7 million bdt/yr by the total proportion of pine in the Supply Zone (70%). This results in a pine pulpwood availability estimate of 2.6 million bdt/yr. This amount was then reduced to 1.6 million bdt/yr based on expected demand from the OSB facility 15 miles from Scooba that is scheduled to begin operations in early 2026. A Biomass Availability Multiple (BAM) of 2.0 was then applied to this quantity, resulting in a rated quantity of 800,000 bdt/yr.[5] The rated quantity of forest residue (185,000 bdt/yr) was determined by applying a BAM of 4.0 to the generation estimate. The high BAM value reflects the lack of regional forest residue supply chain experience.

The rated quantity of sawmill residue (120,000 bdt/yr) is equivalent to 3.7% of the total quantity of residue estimated to be generated annually in the Supply Zone. We confirmed through outreach that most of the 120,000 bdt/yr of sawmill residue is likely to be sourced from within 15 miles of Scooba, MS. The rated price range for wood chips, sawdust, and bark was determined with reference to pricing data available from TimberMart South (Figure E-2, Section E) and through outreach to local forestry professionals.

[4] Between 2003 and 2013, stumpage prices for pine sawtimber in Mississippi decreased from $50/ton to $25/ton (https://extension.msstate.edu/sites/default/files/topic-files/timber-prices/timber-prices-1986-2013/2013_Quarter4.pdf). Pine sawtimber prices have approximated $25/ton since 2013. Softwood pulpwood prices decreased from a high of over $10/ton in 2009 to less than $5/ton in 2023 (https://extension.msstate.edu/sites/default/files/topic-files/timber-prices/timber-prices-2013-present/4Q%202020%20Price%20Report.pdf).

[5] The BAM accounts for uncertainty in underlying data, models, assumptions, and future operating conditions.

**Table B-3. Available and Rated Quantities and Corresponding Rated Price Range for the Evaluated Feedstocks**

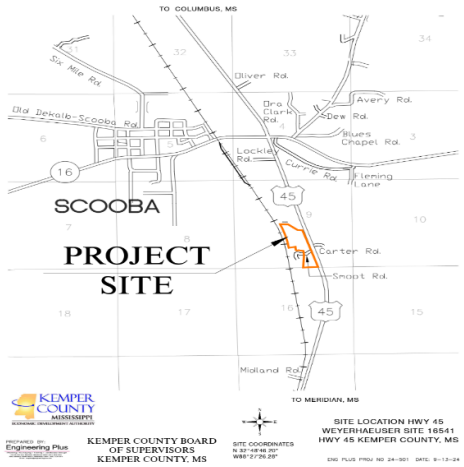
| Feedstock Type | Available Quantity (bdt/yr)[6] | Rated Quantity (bdt/yr) | Rated Price Range ($/bdt delivered)[7] |
|---|---|---|---|
| **Pulpwood** | 1,600,000 | 800,000 | $50-$70 |
| **Forest residue** | 750,000 | 185,000 | $50-$70 |
| **Sawmill residue – Chips** | 1,530,000 | 70,000 | $60-$80 |
| **Sawmill residue – Sawdust** | 750,000 | 30,000 | $60-$80 |
| **Sawmill residue – Shavings** | 675,000 | 0 | N/A |
| **Sawmill residue – Bark** | 310,000 | 20,000 | $40-$60 |
| **Total** | 5,615,000 | 1,105,000 | $40-$80 |

## OPERATIONAL CONSIDERATIONS

Accessing the rated quantity of biomass would require approximately 40 dedicated logging crews.[8] An additional 4-6 forestry companies specialized in mobile chipping/grinding would be required to procure the rated quantity of forest residue.[9] Approximately 95 logging trucks, 20 chip trucks, and an equivalent number of truck drivers would also be required.[10] It is expected that workforce development could be achieved over a period of two-to-three years, given the rated price range. A new project proponent willing to proactively support logging and trucking workforce development through existing institutions would likely expedite the rate of scale-up.

[6] Estimated by considering current and expected future demand, total supply potential, logistical constraints, and other factors.
[7] Prices based on outreach to local forestry professionals, logging cost of $40/bdt, transportation cost of $0.38/bdt/loaded mile over an average distance of 50 miles, and reference to previous BDO Zone ratings in the region (Grenada, MS and Conecuh County, AL).
[8] Assumes a single logging crew produces 30-40 truckloads per week, 28 tons per truckload, and 45 operating weeks per year.
[9] Assumes a single comminution crew processes 25 bdt/hour, operates 6-8 productive hours/day, and works 200 days/year.
[10] Assumes payload of 14 bdt, three trips per day, and 200 working days per year.

## SECTION C: INFRASTRUCTURE




### PROPERTY OVERVIEW

| | |
|---|---|
| **Address:** | 16541 Highway 45 |
| **City:** | Scooba, Mississippi |
| **County:** | Kemper |
| **Acres:** | 34 +/- |
| **Pricing Note:** | $7.500 / Acre - Negotiable |
| **Lease Available:** | Yes |
| **Topography:** | Gently rolling |
| **Zoning:** | Industrial-Light, Industrial - heavy, Commercial |

### SITE CONTACT

Steven Lockley
Executive Director
Kemper County Board of Supervisors
280 Veterans St. De Kalb, MS 39328
601-480-0505
steven@kempereda.com

*Infrastructure Sites Contact*
Bob Buckingham
BDO Zone Infrastructure
bob@ecostrat.com

### PROPERTY PROFILE

A 34-acre site situated alongside the Canadian Pacific Kansas City Railroad and Highway 45 is available for immediate development. Essential utilities, including electricity, natural gas, and water, are either in place or in proposal phases. The site is within a 35-mile drive distance of a major inland waterway that enables commercial shipping and receiving to and from the Gulf Coast.

#### *Transportation*

**Nearest Highway:** MS Highway 45, 4-lane
**Nearest Interstate:** I-20 (35 miles)
**Nearest Airport:** Meridian Regional (45 miles), Limited commercial traffic
**Nearest Commercial Airport:** Birmingham, AL Int'l Airport (155 miles)
**Rail Served:** Yes, CP Kansas City RR (KCS)
**Rail Accessible:** Yes
**Rail Infrastructure in Place:** Yes
**Distance to Nearest Port**: Tennessee-Tombigbee waterway at Epes, AL (33 miles east)

#### *Electric Service*

**Supplier:** East MS Electric Power Assoc
**Ownership:** Cooperative
**Power Provider:** TVA
**Phone:** 888-349-4332
**Website:** https://www.emepa.com
**All Utilities Extend to Site:** Yes
**Capacity**: >10 MWs
**Nearest Substation:** <200 yds 46kV
**Capability:** Existing 25kV line along the eastern site boundary, 46kV along the northern border. Upgrade to 161kV is planned by EMEPA.

#### *Natural Gas*

**Supplier:** Kemper County Utility District
**Ownership:** County
**Phone:** (404) 584-4000
**Website:** https://kempercountyms.gov
**Size of Main:** 6" (proposed)
**Pressure:** 80 psi
**Capability:** Line is currently under construction

#### *Water*

**Supplier:** Porterville Water Association
**Ownership:** Member owned
**Phone:** 662-323-9071
**Website:** www.causeiq.com/organizations/porterville-water-association,640508507/
**Size of Main:** 6"
**Peak Capacity:** 400,000 gals/day
**Capability:** Existing 6" line along eastern property border

#### *Wastewater*

**Supplier:** Town of Scooba
**Ownership:** Municipal
**Phone:** 662-476-8451
**Website:** https://townofscooba.net
**Size of Main:** 12" (proposed)
**Capability:** <400,000 gals/day

#### *Telecommunications*

**Supplier:** AT&T
**Ownership:** IOU
**Phone:** 844-215-3940
**Website:** www.att.com
**Platforms:** Fiber, wireless
**Capability:** AT&T can deliver 1Gbps of fiber service at this site utilizing their Switched Ethernet Product. Additionally, they can provide POTS, 1FB, and T1 circuits.

# SECTION D: RISK INDICATOR SCORING METRICS

## CATEGORY 1.0: SUPPLIER RISK

### *1.1 Risk Factor: Credit-Worthiness/Future Solvency of Suppliers*

*1.1.1 Longevity & History of Supplier Performance*

**Rationale:** Number of years in business is a positive indicator of future solvency. Historical performance is an indicator of future performance.

**Risk Information:** Capacity additions in the Supply Zone over the past decade have outpaced closures, leading to an 80% increase in sawmill capacity over the 2012-2024 period (Figure E-3, Section E). Most wood processing facilities in the region have been operating for decades. There is, therefore, low risk associated with the future solvency of potential suppliers, including sawmills and the network of forestry companies that carry out forest operations in the region.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *1.2 Risk Factor: Conflicts of Interest/Vested Interest with Competing Market(s)*

*1.2.1 Suppliers' Dependence on, or Preference for, Competing Markets*

**Rationale:** Suppliers may have a vested interest or preference in supplying specific competitors with biomass feedstock. Preferences may be due to historical, long-term, or personal relationships, less stringent feedstock quality requirements, more flexible operating hours by competing markets, or suppliers' dependence on competing markets to accept or purchase other products/by-products. During periods of feedstock shortage, such suppliers may be more likely to allocate the scarce supply to competitors, resulting in supply disruptions for the Issuer.

**Risk Information:** Suppliers located within a 30-mile drive distance of Scooba – including the sawmill in Shuqualak, MS and forestry companies – have been experiencing market limitations over the past decade. Current buyers of pine pulpwood and sawmill byproducts are located over 40 miles away from Shuqualak and, therefore, a project located in Scooba would have a locational advantage. Although a large OSB plant in Shuqualak could begin purchasing up to two million tons/yr of pine pulpwood in early 2026, private timberlands in the region are likely to support production of the rated quantity for new projects. Risk is assessed as medium due to uncertainty related to the future regional influence of the OSB plant and sawmill residue supplies from more distant sawmills, many of which are located in close proximity to current buyers.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |

| | |
|---|---|
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *1.3 Risk Factor: Supplier Control Over Production and Transportation*

#### *1.3.1 Ownership of Land/Means of Production*

**Rationale:** Suppliers that own land or a production facility where feedstock is produced tend to have better control of supply chains and present lower degrees of supply risk.

**Risk Information:** Mississippi forests are predominantly privately owned (89%), with only 11% under the ownership of the federal (9%) and state (2%) governments.[11] Wood supply for new projects is most likely to be sourced from private lands less than 100 acres in size; larger corporate tracts of timberland are dedicated to incumbents, including larger pulp and paper mills and sawmills. A new project willing to pay the rated price range would have access to pine pulpwood generated during clearcuts and thinnings on non-corporate private lands in the area. Additional quantities could be available from the Bienville and Tombigbee National Forests.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

#### *1.3.2 Ownership of Equipment*

**Rationale:** In most cases, suppliers that own or lease equipment for harvest, collection, and processing feedstock are at lower risk than those that are not. For example, third-party harvesting equipment may not be available when required. Short harvest windows may be missed if a farmer and company cannot schedule convenient harvest times,

[11] https://www.mfc.ms.gov/wp-content/uploads/2021/01/Mississippi-Forest-Action-Plan-January-2021-compressed.pdf

and quantity shortages can result. However, in some circumstances, reliance on third-party equipment to harvest or produce feedstock can decrease supply chain risk. For example, when harvesting agricultural residue such as corn stover, using a third-party company with standard equipment specializing in harvesting, collection, and transportation may decrease quality variations (e.g., ash content) of the final feedstock.

**Risk Information:** Logging equipment tends to be owned by logging companies. Mobile comminution equipment (chippers and grinders) has not been used by local forestry companies since the late 1990s/early 2000s but is available from retailers in the area. Risk likelihood is assessed as medium due to high inflation in the costs of forestry equipment in recent years and the likely need to investment in mobile chippers and/or grinders.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *1.3.3 Ownership of Transportation/Logistics*

**Rationale:** In most cases, suppliers that own or lease transportation equipment necessary to transport biomass from forests or fields are at lower risk than those that do not. However, in some circumstances, reliance on third parties to transport biomass is common practice and does not contribute to risk.

**Risk Information:** Logging trucks tend to be owned by logging companies; there are few independent trucking companies and owner-operators. Logging companies tend to own two-to-three trucks. Chip trucks are owned by a mixture of sawmills and dedicated trucking companies that work closely in support of the pulp and paper and pellet mills. Additional trucks and trailers that may be required to ensure timely delivery of the rated quantities would likely be purchased under favorable offtake agreements.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment. | **NN** |

| | |
|---|---|
| The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *1.3.4 Feedstock as a Secondary Transformation*

**Rationale:** Secondary transformation is dependent upon the production of primary products. Forest residue, corn stover, bark, and sawmill chips (unless from a dedicated chip mill) are all secondary transformations of a primary product.

Risks are higher if the feedstock is a secondary transformation of a primary, more valuable product. In the absence of markets for the primary product, it may not be economical for suppliers to produce biomass on their own. For example, a supplier may produce dimensional lumber as its primary product and wood chips as a by-product, therefore relying on the health of the housing market for production levels. If the demand for dimensional lumber drops, so can the availability of sawmill residue.

In the case of agricultural feedstocks, such as corn stover, the feedstock is a by-product of a primary crop. Since the primary crop is significantly more lucrative than the residue, it will be a priority for the producer. If the production of the primary crop requires resources to be taken away from the production of the secondary crop (e.g., shorter harvesting windows due to weather), the secondary feedstock supply will suffer. In times of stretched resources, suppliers may also perceive the harvest and collection of the feedstock as a nuisance, potentially decreasing production levels.

Understanding the economic drivers for suppliers' primary products can help gauge risk levels for secondary transformation biomass products.

**Risk Information:** The sawmilling industry in Mississippi and Alabama has been growing over the past decade, driving demand for sawtimber. Pulpwood, forest residue, and sawmill residue are generated as a byproduct of sawtimber harvesting and processing. Significant quantities of pulpwood are also likely to be secured from thinnings in pine plantations by a new project for the rated price range. It is unlikely that primary wood product markets will exhibit a downturn given historical trends and therefore risk is assessed as low.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *1.4 Risk Factor: Supplier Experience*

#### *1.4.1 Fundamental Feedstock Production Experience*

**Rationale:** Risk is higher when suppliers have limited experience with planting, growing, harvesting, processing, and/or collecting biomass. Limited experience may be common for stover or forest residue supply chains where farmers or forestry producers may have no previous experience.

**Risk Information:** Logging companies in the region have been active for generations and are capable of responding to increases in demand. Aggregate sawmilling capacity in the Supply Zone has increased considerably over the past decade, providing assurances that the rated quantities can be supplied at low risk. Any future downturns in wood product markets are not likely to affect the ability of a new project to secure the rated quantities of sawmill residue due to aggregate sawmill capacity in the region. Forest residue supply experience is limited but the rated quantity is not likely to impose undue pressures on the regional workforce for the rated price range over a scale-up period of three-to-five years.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

#### *1.4.2 Production Scale Experience*

**Rationale:** Scale-up entails risk. Risk is higher when suppliers have limited experience producing the required quantity of feedstock.

**Risk Information:** Roundwood harvest removals in the Supply Zone over the 2013-2022 period averaged 8 million bdt/yr (Figure E-1, Section E). There is therefore very low risk associated with pulpwood and sawmill residue production scale experience. Risk is elevated by the lack of forest residue supply chains in the region.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)* | **NN** |

| |
|---|
| No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. **24** |

### *1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity*

#### *1.5.1 Supplier's Equipment Efficiency*

| |
|---|
| **Rationale:** Equipment efficiency significantly influences the supplier's feedstock production capacity. Understanding the supplier's equipment capability enables understanding of their ability to produce feedstock of suitable quality. |
| **Risk Information:** Forestry operations in the region tend to involve clearcutting, whole-tree harvesting (removal of stems and branches), and roadside- or landing-based delimbing and product separation. In pine plantations, stands are often thinned to optimize growth and yield. Smaller logging companies with three-to-six crews have a typical efficiency of 30-40 loads of roundwood per week (~500 bdt/week) whereas large logging companies with over ten crews can reach efficiencies of over 100 loads per week (~1,500 bdt/week). The efficiency of 500 bdt/week would lead to a total roundwood production per crew of 20,000 bdt/yr for a 40-week work year.[12] |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *1.6 Risk Factor: Supplier Motivation*

#### *1.6.1 Feedstock Production Priority*

| |
|---|
| **Rationale:** When biomass feedstock is a secondary or non-core line of business, a by-product, or a residual from a more valuable product, suppliers may not put in sufficient effort for consistent production. The risk of breach increases when feedstock production and/or delivery compromise a supplier's ability to make a primary product.<br><br>When biomass feedstock is a by-product of another main higher margin or main product such as corn stover (e.g., corn) or forest residue (e.g., pulpwood), supply may not be a top priority for a supplier. |
| **Risk Information:** None of the rated feedstock quantities pose a risk to the production of lumber or other value-added forest products. Pulpwood can be readily recovered during conventional forest operations. While large-scale recovery of forest residue from private forest operating areas has yet to be proven, it is unlikely to disrupt sawtimber production. |
| **Raw Risk Likelihood (RRL)** **Score** |

[12] Assuming half of the produced roundwood is pulpwood, a new project would require 40 dedicated crews, or approximately 7 to 14 companies.

| | |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

## CATEGORY 2.0: COMPETITOR RISK

### *2.1 Risk Factor: Influence on Feedstock Supply of Existing Markets*

#### *2.1.1 Competitors' Locations and Overall Geographical Influence*

**Rationale:** Competitors' locations relative to siting locations within a BDO Zone can affect the viability of procuring feedstock and the cost of that feedstock. Accurate and detailed competitor mapping provides an understanding of a competitor's geographical influence on new plants within a BDO Zone, including competitive advantages such as short hauling.

**Risk Information:** Forestry professionals who regularly operate in the region that were contacted during outreach agreed that pine pulpwood generally does not travel further than 50 miles given current market prices (<$50/bdt delivered). Further, loggers are frequently put on quotas by the pulp and paper industry. Pine pulpwood is particularly difficult to sell in the area near Scooba, as the only nearby buyer in Columbus tends to buy exclusively from a single large supplier. Although existing demand is relatively high, the analysis of FIA data in Section B shows that the rated quantities can be made available to new projects without impacting the wood supply of incumbents. Note, however, nearby competitors, including the planned OSB mill in Shuqualak, MS (15 miles from Scooba) and a large pellet mill in Epes, AL (30 miles from Scooba), have the potential to increase pine pulpwood purchases, depending on end product markets.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score** | **Score** |

| | |
|---|---|
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **36** |

### *2.1.2 Current and Historical Consumption of Feedstock Quantity*

**Rationale:** Clear understanding of feedstock consumption by key competitors for each rated feedstock type in the BDO Zone is essential to quantifying competitor risk.

Understanding current consumption and historical trends of feedstock utilization can provide valuable information about feedstock price elasticity during shortages and insight into events that may impact future supply conditions. It can enable more accurate estimates of the sensitivity of feedstock availability to potential future consumption levels or the impact of external events (e.g., weather events, structural economic changes, seasonality, or policy change).

**Risk Information:** As reported in Section B, total intake by the identified competitors is 6.5 million bdt/yr after adjusting for overlap with the Supply Zone. Approximately 3 million bdt/yr of this is expected to be comprised of pulpwood and the remainder sawmill residue. Feedstock consumption by competitors in the Competition Zone has been increasing over the past decade. Pulp and paper capacity increased by 8% whereas pellet production capacity increased by a factor of five (Figure E-4, Section E). However, recent closures of chipping yards within the Supply Zone, depressed pine pulpwood prices, and outreach to forestry professionals indicate that demand for pine pulpwood has been decreasing over time. Overall risk is assessed as low-to-medium.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *2.1.3 Competitor Pricing and Price Sensitivity*

**Rationale:** Understanding how much competitors pay (or receive) for different feedstock types is essential in determining the Issuer's competitiveness and accurately assessing the delivered cost range in the BDO Zone rating.

Current and historical prices paid/received by competitors provide insight into their procurement behaviors and exert pressure on suppliers in the BDO Zone, such as the ability/willingness to pay premiums for feedstock during times of feedstock shortage or reduce prices (or cut-off deliveries) during gluts. Competitors that have the ability to offer higher prices for feedstock during feedstock shortages can pose a significant risk to the Issuer.

Knowledge of competitor pricing and price sensitivity is also an essential prerequisite to formulating a feedstock cost curve, which can enable predictions of feedstock redundancy, i.e., how much feedstock could become available at different pricing levels (see Category 3–Supply Chain Risk 3.1.3).

**Risk Information:** Pine pulpwood prices currently average ~$25/ton delivered ($50/bdt). Logging costs in clearcut operations generally do not permit transportation distances of more than 50 miles for this price. In thinning operations, low sawtimber recovery and logging costs further constrain economical transport distance. As a result, the regional pine pulpwood resource is underutilized. It is expected that the rated quantity could be secured at the rated price range of $50-$70/bdt. Local experts contacted during outreach stated that buyers of pine pulpwood in the area around Scooba have not paid more than $25/ton ($50/bdt) in recent years. During the 2020-22 COVID-19 pandemic, pine pulpwood prices increased to up to $35/ton, but this was temporary. Regional pine pulpwood prices exhibited a gradual decline over the 2010-2023 period (Figure E-2, Section E).

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors*

**Rationale:** Feedstock utilization in a BDO Zone can change over time. Expansion of feedstock demand by current competitors can put additional pressure on feedstock and lead to higher prices, feedstock disruptions, shortages, supplier breaches, or other types of supply chain disruption.

If current markets for feedstock have been publicly signaling the potential for increased demand for feedstock (in the case of a sawmill adding a shift or pulp mill potentially expanding into the production of renewable chemicals, for example), high interest in a supply zone can make suppliers overconfident, leading to a supplier-controlled market where short-term contracting becomes the norm and supply chain reliability is compromised for the Issuer. If and when it occurs, increased demand on feedstock may decrease availability and increase cost for new plants within the BDO Zone.

**Risk Information:** The history of competitor capacity increases indicates that there is a low risk of future demand by the regional pulp and paper industry and medium-to-high risk of future demand by the regional wood pellet industry (Figure E-4, Section E). The planned OSB facility in Shuqualak, MS and the existing pellet mill in Epes, AL increase risk due to their proximity to Scooba. The rated quantity of pulpwood (800,000 bdt/yr) was determined after accounting for the expected demands of the new OSB facility.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |

| | |
|---|---|
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *2.1.5 Soft Supply Influence of Existing Markets*

**Rationale:** In some cases, existing markets for feedstock may be able to exert high degrees of pressure over local suppliers, effectively enabling control of feedstock, especially during times of shortage. This control can derive from qualitative or "soft" factors, such as long previous relationships between local suppliers and existing markets for feedstock.

**Risk Information:** Pulp and paper facilities have consistently imposed quotas on the amount of pulpwood they are willing to buy. Given the lack of demand for pine pulpwood in recent years and the large volumes available, we associate low risk for this feedstock type. Sawmill residue is fully utilized and is a priority feedstock for the pellet and pulp and paper industries. Risk of soft supply influence of existing markets on the rated quantities of sawmill residue is low-to-medium, as the rated quantities represent only 3.7% of total production and were determined on the basis of direct calls to sawmills. There is no current demand for forest residue.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *2.1.6 Temporary Market-Driven Markets*

**Rationale:** Alternative, non-traditional, market-driven competitors for feedstock can drive feedstock demand in unusual circumstances. A BDO Zone Rating Issuer based on corn stover as a feedstock, for example, would not typically compete with higher-end animal feed markets due to quality issues. However, in times of significant hay shortage (e.g., during

drought), farmers use corn stover in place of hay, driving the price of feedstock and decreasing availability for bio-projects.[13]

**Risk Information:** A review and analysis of the quarterly feedstock prices for pulpwood, sawdust, hog fuel and whole tree chips does not indicate any seasonal variation in pricing. In addition, no temporary markets were identified.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **4** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

## *2.2 Risk Factor: Specific Competitors' Competitive Advantage*

### *2.2.1 Relative Inventory Capacity*

**Rationale:** The more inventory a competing biomass facility is able to store, the more competitive pressure it can exert on supply. The ability to store large inventories allows competitors to purchase inventory when the prices are low, potentially giving it an economic advantage. Additionally, the ability to store inventory during feedstock supply surpluses can enable competitors to continue to intake feedstock when the Issuer's plant (with lesser inventory capacity) may be forced to put suppliers on quota. Larger inventory capacity on the part of competing markets creates supplier loyalty and can make it more difficult for new projects to secure supply without paying a significant premium.

**Risk Information:** The pulp and paper industry has a very large inventory capacity. Most pulp and paper mills in the region have large holding yards. There are also approximately five chipping yards that are used to stockpile and chip pulpwood for supply to mills. The number of chipping yards used by the regional pulp and paper industry has been declining, with yard closures in Meridian and Louisville, MS in recent years. Risk is diminished due to the high availability of pine pulpwood in the region. While many competitors have the ability to stockpile sawmill residue, this is not likely to impose a risk to the rated quantities.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment. | **NN** |

[13] Bergtold, 2018.

| |
|---|
| *RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *2.2.2 Relative Accessibility/Delivery Hours and Wait Times*

| |
|---|
| **Rationale:** The value attributed by suppliers to local competing markets for biomass is often directly related to the degree of flexibility the market provides in terms of delivery hours and the more efficient discharge can occur. |
| **Risk Information:** Through outreach to individuals involved in logging and trucking operations, we found that truck drivers must often wait up to two hours to get unloaded at some pulp and paper facilities in the region. The fact that pulp and paper facilities have consistently imposed quotas on pulpwood deliveries further reduces risk that the rated quantity of pulpwood will not be available. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *2.2.3 Relative Specification Advantages*

| |
|---|
| **Rationale:** When choosing a market for biomass feedstock, suppliers not only look at price but also at relative quality requirements or specifications. It is important to understand feedstock quality specifications for competing markets within the BDO Zone in order to accurately quantify the risk that competitors can exert on the Issuer's supply chain. |
| **Risk Information:** No relative specification advantages were identified. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)* |

| | |
|---|---|
| No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *2.2.4 Demand for Competitors' Products*

**Rationale:** Increased demand for the competitor's final product can cause increased demand for feedstock by the competitor. For example, an increased demand for wood pellets due to high energy prices in Europe or for biofuels due to a favorable clean fuels policy can cause increased pellet/biofuel production by competing markets. Thereby driving demand for feedstock within a BDO Zone.

**Risk Information:** The pulp and paper industry in the U.S. South has managed to avoid curtailments and closures in the past decades, due in large part to the relatively low delivered cost of wood.[14] However, growth has been marginal due to reduced pulp and paper product prices (Figure E-4, Section E). The pellet industry has expanded by a factor of five over the past decade but growth in recent years has been modest (Figure E-4, Section E). Risk is elevated due to close proximity of the planned OSB mill in Shuqualak, MS and the Epes, AL pellet mill.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

## CATEGORY 3.0: SUPPLY CHAIN RISK

### *3.1 Risk Factor: Feedstock Availability*

### *3.1.1 Biomass Availability Multiple (BAM)*

**Rationale:** Biomass Availability Multiple (BAM) indicates the degree of redundancy in an Issuer's supply chain in relation to the rated quantity in the BDO Zone. BAM is the mean ratio of biomass feedstock available to a project in relation to delivered cost, divided by the Issuer's mean rated quantity. BAM is a strong indicator of supply chain resilience when stressed by a supply shortage and/or supplier breach. BAMs of 1.5 or higher are generally signals of lower feedstock risk for new projects in BDO Zones.

**Risk Information:** After accounting for the demands of the OSB facility in Shuqualak and the need to maintain a GTD ratio of 1.2, the amount of pine pulpwood available for new projects was estimated to be 1.6 million bdt/yr. A Biomass Availability Multiple (BAM) of 2.0 was applied to this quantity, resulting in a rated quantity of 800,000 bdt/yr.[15] The

[14] Labor, land, and capital costs in the U.S. South are some of the lowest in the country.
[15] The BAM accounts for uncertainty in underlying data, models, assumptions, and future operating conditions.

rated quantity of forest residue (185,000 bdt/yr) was determined by applying a BAM of 4.0 to the availability estimate. The high BAM value reflects the lack of regional forest residue supply chain experience. The rated quantity of sawmill residue is equivalent to 3.7% of the total quantity of residue estimated to be generated annually in the Supply Zone. This quantity was estimated on the basis of direct outreach to local sawmills. Due to the coarse resolution of FIA data and uncertainty associated with many of the assumptions and estimates that underlie the supply and competition analyses, the risk that these estimates are inaccurate is assessed as medium.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **36** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **36** |

### *3.1.2 Feedstock Supply Curve/Marginal Cost Curve*

**Rationale:** The greater the feasible transport distance, the more feedstock is accessible to the Issuer, but at a higher delivered cost. The feedstock supply curve, sometimes referred to as the marginal cost curve, is a function of feedstock availability over its cost, which is primarily, but not exclusively, a function of distance. The feedstock supply curve is used to determine the availability of redundant feedstock at various price points, as well as the cost of replacing feedstock with substitutes located at different distances.

Feedstock cost curves are useful in determining supply chain resilience; they provide information about the cost of feedstock availability in times of supply disturbance. Biomass supply chains are prone to supply disturbances over time; suppliers can become insolvent, or weather events can temporarily disrupt feedstock availability. When a disturbance occurs, the Issuer may need to source replacement feedstock from different suppliers at different locations and at different costs. A biomass supply curve indicates quantities of feedstock available at various price levels from suppliers generally located further away than the core supplier.

**Risk Information:** FIA data indicates that over half of the pulpwood annually harvested in the Supply Zone is located over 60 miles from Scooba (Figure E-5, Section E). This is corroborated by information provided by representatives of logging companies during outreach, who noted that large quantities of pine pulpwood remain unharvested in the area around Louisville, MS, 50 miles from Scooba. The marginal cost curve shows that pulpwood can be available for delivered prices less than $70/bdt for a travel distance of up to 75 miles (Figure E-6, Section E). Although a new project would likely be supplied with pulpwood sourced from distances of up to 75 miles given the rated price range ($50-$70/bdt), the higher transport distances increase risk to diesel price spikes, competition from other buyers of pine pulpwood (particularly the OSB mill in Shuqualak), and other factors. Proponents of a new project will need to engage in a more detailed geographic supply assessment to further resolve the likely areas from which pulpwood is likely to be sourced.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *3.1.3 Seasonal Feedstock Supply Variation*

**Rationale:** Biomass supply can present significant seasonal variations. Seasonal supply variations, combined with limitations associated with longer-distance transportation and storage, can lead to BDO Zone biomass supply imbalances,[16] which can manifest in shortages and higher costs for Issuers.

**Risk Information:** There are no significant seasonal operational disruptions in this area of the United States. During the wet season (late-November to mid-March), logging activity is restricted to upland areas but overall operational activity is not significantly affected. Operations are sometimes put on hold during periods of heavy rainfall but this does not lead to significant disruptions in wood supply.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *3.1.4 Year-to-Year Variation in Feedstock Availability*

**Rationale:** Biomass can have significant year-to-year supply variations due to variability in yield from biomass harvesting operations, particularly with agricultural biomass.

[16] Golecha & Gan, 2016.

| |
|---|
| **Risk Information:** Sawmilling capacity has increased over the past decade and timber harvesting operations have expanded to meet this demand. Harvesting activity in the U.S. South is the highest in the country. Risk is assessed as very low. |
| **Raw Risk Likelihood (RRL)** **Score** |
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. **2** |
| **Raw Risk Impact (RRI)** **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. **2** |
| **Gross Risk Indicator (GRI)** **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. **4** |
| **Mitigation/Notching** **Notch** |
| *RRL Mitigation (Notch)* **NN** |
| No adjustment. |
| *RRI Mitigation (Notch)* |
| No adjustment. |
| The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. **4** |

## *3.2 Risk Factor: Historical Issues*

### *3.2.1 Historical Feedstock Price Variations*

| |
|---|
| **Rationale:** If the historical feedstock price shows volatility, then the risk of future price fluctuation is elevated. If feedstock prices have historically exceeded the price at which the Issuer would have to cease operations or breach a financial covenant (i.e., the "red line" feedstock cost), then mitigation measures should be put in place. |
| **Risk Information:** As shown in Figure E-2, prices for pine pulpwood and sawmill residue have not exhibited significant volatility over the past decade. Prices for pine pulpwood decreased by approximately 50% between 2003 and 2013 and have not rebounded.[17] |
| **Raw Risk Likelihood (RRL)** **Score** |
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch** |
| *RRL Mitigation (Notch)* **NN** |
| No adjustment. |
| *RRI Mitigation (Notch)* |
| No adjustment. |
| The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

[17] https://extension.msstate.edu/sites/default/files/topic-files/timber-prices/timber-prices-1986-2013/2013_Quarter4.pdf

### *3.2.2 Historical Demand for Feedstock in the BDO Zone*

**Rationale:** If Issuer BDO Zone does not have a history of developed large-scale feedstock procurement, suppliers may not have sufficient expertise in feedstock production to ensure reliable supply, especially in the early years. This can be particularly true for forest residue, where, typically, the infrastructure for collection, processing, and delivery is immature.

Where supply chains are not well-established, risk can be mitigated when new bio-based plants control a higher degree of feedstock processing. For example, if a BDO Zone rating is issued for clean wood chips and the historical demand in the Zone has been exclusively for pulpwood, then supply chain risk will be decreased for new bio-based plants that intake pulpwood and manage log debarking and chipping internally, rather than requiring inexperienced suppliers to deliver debarked wood chips.

**Risk Information:** Demand for feedstock in the Supply Zone has increased over the past decade (Figure E-4, Appendix E). This demand has mainly been supplied with sawmill residuals, as pulpwood prices have declined (Figure E-2, Appendix E). Forest residue supply chains are uncommon in the two states but we expect that the workforce would be able to recover the rated quantity over a scale-up period of two-to-three years.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *3.2.3 History of Production/Feedstock is a New/Secondary Crop or By-Product*

**Rationale:** If the feedstock is a new/secondary crop or a by-product, suppliers may either lack sufficient experience to mitigate risk or be unable to react to such risk. Secondary crops or by-product producers may be less likely to prioritize production.

For new crop types, inexperience in planting, harvest, collection, and yield data may pose higher levels of risk.

If the feedstock is a secondary transformation (i.e., wheat straw, corn stover, or forest residue), then production can be subject to variables beyond suppliers' control (e.g., changing demand for sawtimber or primary crop prices).

**Risk Information:** Pulpwood and sawmill residuals are produced as byproducts of sawtimber and lumber production and are ultimately subject to oscillations in final product markets (e.g., lumber, veneer, plywood). The history of sawmill capacity stability and growth in the region provides assurances that final product markets remain stable (Figure E-3, Appendix E). Forest residue presents some risk because forest residue supply chains are uncommon in the region.

| |
|---|
| However, the workforce is sufficiently skilled and experienced to ensure reliable delivery of the rated quantities over a scale-up period of two-to-three years. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 24 out of 100. **24** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. **24** |

### *3.3 Risk Factor: Non-Weather Based Externalities*

#### *3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)*

| |
|---|
| **Rationale:** CPI and PPI can impact feedstock cost of harvest and collection over time. Sensitivities to worst-case scenarios should be run. |
| **Risk Information:** Between 2021 and 2022, the Consumer Price Index (CPI) for the U.S. South increased significantly due to the COVID-19 pandemic and associated lockdowns. The national Producer Price Index (PPI) experienced a comparable increase during this period. However, since 2023, these inflationary pressures have started to stabilize, partly due to the Federal Reserve's interest rate hikes. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 24 out of 100. **24** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. **24** |

### *3.3.2 Currency Risk*

**Rationale:** Where feedstock is purchased in a currency different than that which a new bio-based plant will locate in a BDO Zone, currency exchange rates and volatility can constitute risk exposure. BDO Zones that cross the US-Canada border, for example, which intake feedstock from both countries, are exposed to such currency risk.

**Risk Information:** Not relevant.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |
| The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

### *3.3.3 Border Risk*

**Rationale:** Where feedstock is transported cross-border to another country, risk exposure to border closures and crossing delays becomes present. The availability of trucks willing to do cross-border runs is limited, which can decrease supply chain flexibility and resilience. Plants near the US-Canada border, which intake feedstock from both countries, are exposed to these risks.

**Risk Information:** Not relevant.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |
| Click or tap here to enter text.The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

### *3.3.4 Temporary Externality-Driven Markets for Feedstock*

**Rationale:** Alternative, non-traditional, externality-driven competitors for feedstock can drive feedstock demand (and cost) in unusual circumstances. For example, an Issuer using corn stover as a feedstock would not typically compete with the higher-end animal feed market. However, in times of significant hay shortage (e.g., during drought), farmers may use corn stover as hay replacement, driving the price of stover feedstock and decreasing its availability for bio-projects.[18]

**Risk Information:** No temporary markets were identified.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |

[18] Bergtold, 2018.

| | |
|---|---|
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

### *3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection*

#### *3.4.1 Harvest & Collection Practices & Schedules*

**Rationale:** Differences in harvest timing and practices used can create risk to both the quantity and quality of feedstock. For example, feedstock harvested by different suppliers in different windows can undergo varying levels of exposure to sun, wind, and moisture, leading to variations in delivered feedstock quality.

For example, agricultural feedstocks and energy crops have optimal harvesting windows to ensure minimal moisture content. In certain BDO Zones, these harvesting windows may coincide with heightened weather risks, such as frost or rain.

For forestry biomass, unsightly clear-cuts and slash piles (even on plantation forests and especially when located near communities) can provoke unwanted public backlash even when suitable and sustainable replanting regimes are followed.

**Risk Information:** Pine pulpwood is produced during clearcut and thinning operations. Clearcut operations are driven by demand for sawtimber, whereas thinnings are dependent on adequate pine pulpwood prices. Discussions with local forestry professionals confirmed that the rated price range would be sufficient to incent timberland owners and logging companies to thin pine plantations, a requirement for growth and yield optimization. There are no other notable practices and schedules relevant to the risk assessment of pulpwood. For forest residue, it is expected that companies would comminute slash after operations have concluded, minimizing risk of operational inefficiency. Current practice is to spread slash in cutovers or at roadside, or to pile and burn.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment. | **Notch**<br>**NN** |

| | |
|---|---|
| The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *3.4.2 Harvesting & Collection Equipment*

**Rationale:** Different types of harvesting and collection equipment used by suppliers in a BDO Zone can have a significant impact on the quality and availability of feedstock. Using different types and combinations of harvesting, collection, and processing equipment among suppliers can lead to non-homogeneous feedstock. Equipment that is not designed specifically for biomass cultivation, harvesting, and collection can increase feedstock quality risks.

Relevant equipment should be specified for the sake of product consistency and risk reduction.

**Risk Information:** Logging equipment used in the region is conventional and includes harvesters, skidders, and loaders. Forest residue recovery will likely require the purchase or lease of additional chipping or grinding units, therefore, risk is increased.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *3.4.3 Variation in Densification Methods Among Different Suppliers*

**Rationale:** The shape and density of the unit in which feedstock is supplied can impact feedstock cost and quality. Standard feedstock densification modes for biomass consist of round or square bales, pellets, cubes, chips, or grindings. The size of wood fiber processed in a grinder is less homogenous than if a chipper is used.

Bales of different densities can absorb moisture at different rates. In certain cases, round bales have been viewed as problematic due to their uneven moisture content distribution.[19]

**Risk Information:** Densification methods for pulpwood and forest residue are restricted to chipping and grinding, which are conventional. Variation in densification methods used (e.g., chipping vs. grinding) is not expected to affect project operations as long as the supply chain is managed appropriately.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |

[19] Huhnke, 2018.

| | |
|---|---|
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 8 out of 100. | **Score**<br>**8** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100. | **Score**<br>**8** |

### *3.4.4 Availability of Labor for Feedstock Production*

**Rationale:** Skilled labor shortages can be difficult to remedy in the short term. The availability of suitable labor in an area can impact the ability to procure sufficient feedstock quantities on required schedules. Labor risks are higher where supply chains are not yet active or for Issuers for whom large feedstock requirements or the development of new (or expanded) supply chains demand significant additions to the local labor force.

**Risk Information:** Accessing the rated quantity of biomass would require approximately 40 dedicated logging crews and 215 logging trucks and operators (See Section B). An additional four-to-six forestry contractors specialized in in-woods chipping/grinding would be required to procure the rated quantity of forest residue. There are no official statistics available on current logging workforce size in the region. While some portion of these demands could be met with the current workforce, sourcing the rated quantity of pulpwood will require recruitment of additional forestry equipment and logging truck operators. There has been a long-term downward trend in workforce size throughout the U.S. South. Long-term workforce attribution could be mitigated through training programs. Training of equipment operators is offered through the Logging Equipment Operator Academy, hosted by Hinds Community College in Raymond, MS (140 miles from Scooba) in partnership with the Mississippi Loggers Association and Mississippi Forestry Commission. Simulator- and field-based training is provided under the program. There are, however, no dedicated training institutions for logging truck operators.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed high, therefore the RRI is 8 out of 10. | **Score**<br>**8** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 48 out of 100. | **Score**<br>**48** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100. | **Score**<br>**48** |

## *3.5 Risk Factor: Transportation*

### *3.5.1 Feedstock Transportation Costs*

**Rationale:** Transportation can be one of the most significant cost components of biomass supply chains. The average transport cost and percentage of total feedstock cost attributable to transport should be known.

Transport distances of 80-120 km for biomass feedstocks are typical, but larger distances can be common. Where the average transport distance from suppliers to Issuers is high, the supply chain is subject to greater sensitivities to risks, such as increases in diesel cost, weather impacts, mechanical breakdown, and the demand for scarce feedstock from competitors closer to the source.

Understanding average transport distance can help flag higher-risk BDO Zones where transport distance materially exceeds the average.

**Risk Information:** USFS FIA harvesting removal data indicates that the majority of pulpwood harvesting in the Supply Zone in recent years has occurred at distances of over 60 miles from Scooba, MS (Figure E-5, Section E). This was confirmed during outreach. Logging professionals who operate in the region reported extensive private timberlands are available for harvesting in the area around Louisville, MS, approximately 50 miles NW of Scooba. Risk is assessed as medium-to-high due to the relatively long transport distances that may be required and the presence of a large competitor. Trucking costs are approximately $0.38/bdt/loaded mile. An OSB plant with an intake of 1 million bdt/yr of pine pulpwood located in Shuqualak (15 miles from Scooba) will begin operating in early 2026. The plant has a locational advantage to the available pulpwood supplies. Delivered pulpwood prices to new facilities located in the vicinity of Scooba may be near the high end of the reported price range ($70/bdt).

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **36** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **36** |

### *3.5.2 Diesel Cost Impacts*

**Rationale:** Changes in diesel costs impact transport costs over time. Sensitivities to worst-case scenarios should be run.

**Risk Information:** Over the 1995-2023 period, Gulf Coast PADD 3 diesel prices have been an average of $0.14/gallon less expensive than average US diesel prices (Figure E-7, Section E). Peak inflation-adjusted diesel prices were reached in 2008, 2011-2014, and 2022 (Figure E-8, Section E). As of September 2024, the US EIA forecasts a slight decline in retail diesel prices in 2025. A new project may have to consistently source pulpwood from distances greater than 60 miles (see Risk Indicator 3.5.1) and therefore overall risk associated with diesel costs is judged to be medium.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|

| | |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *3.5.3 Transportation of Feedstock Requires Specialized Equipment*

| | |
|---|---|
| **Rationale:** Requirements for specialized transport equipment (e.g., walking-floor trailers) can increase supply chain risk. Where there is low availability of required transportation equipment, equipment owners have increased leverage over transportation prices, and supply chain resiliency can be lower. | |
| **Risk Information:** No specialized equipment is required to transport the roundwood or residue. | |
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *3.5.4 Delivery Routes through Local Communities*

| | |
|---|---|
| **Rationale:** Transportation of biomass can become a nuisance to local communities, especially if a large number of trucks pass through residential and school areas. Local communities often have the power to force regulations regarding truck transport, impeding the ability of BDO Zone suppliers to transport feedstock. | |
| **Risk Information:** Local populations are familiar with forestry truck traffic. No instances of opposition to road traffic were identified during literature review and outreach. | |
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)** | **Score** |

| | |
|---|---|
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *3.5.5 Transportation Regulations & Local Weight Limits*

**Rationale:** In many BDO Zones, transportation is regulated based on seasonal road conditions. These regulations (e.g., "frost laws") often take the form of weight restrictions or limits on the number of trucks allowed on roads. Such regulations can impede the project's ability to source sufficient feedstock or increase the cost of doing so at certain times of the year.

**Risk Information:** Under transportation regulations in MS and AL, a typical logging truck configuration can deliver a payload of 27-28 tons. No issues related to weight limits were identified during outreach.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

### *3.5.6 Road Infrastructure*

**Rationale:** Feedstock cost and availability can be a function of road infrastructure, in particular the accessibility the infrastructure provides to feedstock. Issues with road networks will translate directly to risks to feedstock supply.

**Risk Information:** No issues associated with the quality of roads and bridges were identified during outreach. Many areas of Mississippi are known to have below-average road quality but the forestry workforce is accustomed to these deficiencies, such that productivity is not affected.[20]

[20] Roads infrastructure is particularly deficient in central-western MS (https://www.clarionledger.com/story/news/local/2024/01/21/why-are-mississippi-roads-so-bad-filled-with-dips-and-humps/72165996007/).

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *3.5.7 Transportation Redundancy*

**Rationale:** Transport equipment redundancy is important for dealing with seasonally variable feedstock supplies as well as the risk of equipment breakdowns.

**Risk Information:** The number of logging trucks and chip trucks in the region is insufficient for current industry demands, leading to occasional delivery delays. Long-term attrition of experienced truck drivers can be linked to rising insurance rates and labor competition with other industries. Approximately 95 logging trucks, 20 chip trucks, and an equivalent number of truck drivers would be required to ensure reliable delivery of the rated quantities.[21] While some portion of this demand will be met with existing capacity, this is a significant scale-up challenge.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed high, therefore the RRL is 8 out of 10. | **Score**<br>**8** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed high, therefore the RRI is 8 out of 10. | **Score**<br>**8** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 64 out of 100. | **Score**<br>**64** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>There are a number of proactive workforce development institutions and programs present in the region that are relevant to logging truck driver recruitment. The Forestry Works! Initiative, led by the Forestry Workforce Training Institute and industry partners, has the goal of ensuring a long-term supply of qualified workers for the logging and wood product manufacturing industries. The Alabama Department of Commerce Workforce Development, Alabama Industrial Development Training, and community colleges and universities in Alabama and Mississippi also provide services and programs that encourage forestry workforce development.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**25%** |
| **Loaded RI Score** | **Score** |

[21] Assumes payload of 14 bdt, three trips per day, and 200 working days per year.

| The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100. | **48** |
|---|---|

### *3.6 Risk Factor: Supply Chain Resiliency*

#### *3.6.1 Size, Number, and Location of Suppliers*

**Rationale:** In general, a supply portfolio involving multiple suppliers of various sizes (and from multiple BDO Zones) is important for ensuring steady and uninterrupted feedstock supply with minimal price fluctuations. If a small number of large suppliers provides a high proportion of total feedstock, a disruption or supplier breach will have greater impact on the supply chain. In such cases the risk of disruption is lower, but the impact of those disruptions is higher. Conversely, many small suppliers are less likely to have the capacity to withstand internal disruptions and thus may be more likely to breach. Here, risk of disruption is higher, but their likely impact is lower. The number of suppliers as well as the ratio of small to large suppliers should be optimized.

There is no pre-determined number or optimal ratio of suppliers, although having too many or too few can both pose higher degrees of risk.

**Risk Information:** The majority of loggers in the region are companies with multiple crews (three to six crews per company, on average). There are also a few larger logging companies with over ten crews but these tend to work exclusively for large incumbents. The 17 sawmills located within 75 miles of Scooba range in capacity from 5 to 350 MMBF/yr, with an average capacity of approximately 100 MMBF/yr. We determined through outreach that a new project might have initial problems finding loggers willing to supply some portion of the rated quantity and, therefore, risk likelihood is assessed as medium.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

#### *3.6.2 Suppliers Subject to Same External Risk Factors*

**Rationale:** When a single risk event can impact the feedstock production ability of all (or most) suppliers, then feedstock risk is higher and supply chain resiliency is lower. Resilience is maximized when biomass supply chains exhibit diversity in spatial location (i.e., geography), production practices, and other elements of supply chain structures such that the impact of single high-risk events have varying impacts on suppliers.

**Risk Information:** Pine sawtimber stumpage prices in MS have averaged $20-$25/ton since 2013.[22] Private landowners are generally willing to harvest at these prices. Any significant change in demand for pine products would have a

[22] https://extension.msstate.edu/sites/default/files/topic-files/timber-prices/timber-prices-2013-present/4Q%202020%20Price%20Report.pdf

| |
|---|
| significant impact on clearcutting activity but would not significantly affect thinning activity. Risk is assessed as medium due to the dependence of the majority of the rated feedstocks on pine sawtimber demand and pricing. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36** |

### *3.6.3 Land Ownership Structures*

| |
|---|
| **Rationale:** The ownership (or control) of the land base on which feedstock is produced can have a significant impact on the Issuer's feedstock risks. Risk of long-term variation in stumpage cost for wood fiber (i.e., the cost that one pays to a landowner for the right to cut and purchase their wood fiber), for example, is much higher in the US, where >90% of the land is private, and thus stumpage cost is determined on a competitive auction basis. Conversely, in Canada, >90% of the land is owned by the Crown, and stumpage is allocated by the government. |
| **Risk Information:** Private timberland owners are expected to allow harvesting given the rated price range, which would ensure a pulpwood stumpage price at or above recent historic market prices for pulpwood ($3/green ton). Small private landowners in Mississippi and Alabama have a long history of supporting the forest industry through active management and harvesting of timber resources. Approximately 90% of timberland in the Supply Zone is privately owned. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

## *3.7 Risk Factor: Climate and Natural Risks*

### *3.7.1 Seasonal Weather Impacts on Feedstock Supply*

**Rationale:** Seasonal weather impacts are defined as those deriving from natural weather variations (e.g., spring thaws, rainy seasons, or dry seasons—as opposed to singular weather events like fires, droughts, or hurricanes). Seasonal weather changes can be a significant risk factor affecting feedstock availability, quality, and price.

Given the significant influence that weather has on multiple aspects of growing, harvesting, and transporting biomass, it is difficult to predict the availability of biomass at a specific location at different points in the future with a high degree of certainty. However, it is still possible, using past data and statistical models, to generate reasonable upper/lower bound estimates of biomass production in any given year in a wider supply zone. Such estimates are essential in assessing feedstock risk and enable accurate assessment of the efficacy of the Issuer's mitigation methods.

**Risk Information:** As described in Risk Indicator 3.1.3, there are no significant seasonal forest operational disruptions in this area of the United States. Operations are sometimes put on hold during periods of heavy rainfall but this does not lead to significant disruptions in wood supply.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *3.7.2 Long-Term Weather and Climate Trends*

**Rationale:** In certain BDO Zones, climatic trends and significant potential changes to future weather patterns can create feedstock risk.

**Risk Information:** No long-term weather or climate change risks to feedstock supply were identified.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)* | **NN** |

| |
|---|
| No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *3.7.3 Forest/Crop Fire*

**Rationale:** Forest/crop fires, especially when occurring on a large scale, destroy feedstock and create shortages.

Fire-prone conditions are predicted to increase across Canada. This could potentially result in a doubling of the amount of area burned by the end of this century compared with amounts burned in recent decades. Boreal forests, which have been historically greatly influenced by fire, will likely be especially affected by this change.

Other climate change impacts that could add damaged or dead wood to the forest fuel load (e.g., as a result of insect outbreaks, ice storms, or high winds) may increase the risk of fire activity. New research is aimed at refining these climate change estimates of fire activity and investigating adaptation strategies and options to deal with future fire occurrences. There is growing consensus that as wildfire activity increases, fire agency suppression efforts will be increasingly strained. However, analyses of fire history suggest that the effect of climate variability on precipitation regimes is the primary reason for the decreasing fire activity in the southern BDO Zone of Canada.

**Risk Information:** Wildfires in Mississippi and Alabama affect a very small percentage of total forestland area. For example, in 2023 approximately 20,000 acres were burned in Mississippi out of 19.2 million acres of forestland.[23] It was confirmed through outreach that wildfires have never affected wood supply in the region.

| |
|---|
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. **2** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. **2** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. **4** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. **4** |

### *3.7.4 Risk of Infestation*

**Rationale:** Risk of future infestation, including its estimated consequences on feedstock supply, should be calculated into the overall risk profile.

Since forest insect populations are influenced by environmental conditions, future changes in climate can be expected to significantly alter the outbreak dynamics of certain forest insect species. In some cases, larger and more frequent

[23] https://www.mfc.ms.gov/wildfires/

insect outbreaks may occur, but in other cases, recurring outbreaks may be disrupted or diminished. As the climate continues to change, we can expect more situations, particularly at the margins of tree ranges, where sub-optimal conditions for tree growth and reduced tree vigor can lead to outbreaks of forest insects.

**Risk Information:** Southern pine beetle infestations have occurred in southern areas of MS but have not had a significant impact on tree mortality in recent years.[24]

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

### *3.7.5 Risk of Hail*

**Rationale:** Hail has negligible impact on forestry biomass but is one of the principal destroyers of agricultural crops in North America.

There is much uncertainty about the effects of anthropogenic climate change on the frequency and severity of extreme weather events like hailstorms and their subsequent economic losses. Some studies indicate a strong positive relationship between hailstorm activity and hailstorm damage, as predicted by minimum temperatures using simple correlations. This relationship suggests that hailstorm damage may increase in the future if global warming leads to further temperature increases.

**Risk Information:** Not relevant.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |
| The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

[24] https://www.researchgate.net/profile/John-Riggins/publication/299604697_Forest_Management_and_Southern_Pine_Beetle_Outbreaks_A_Historical_Perspective/links/5702a01608ae646a9da87681/Forest-Management-and-Southern-Pine-Beetle-Outbreaks-A-Historical-Perspective.pdf

### *3.7.6 Risk of Flood*

**Rationale:** Floods can cause catastrophic disruption and delay in feedstock supply. Where there is a high risk of flood and thus a negative impact on feedstock supply, the BDO Zone rating should account for this risk.

**Risk Information:** Floods do not occur with sufficient regularity, extent, and intensity to affect forest operations and wood supply in the Supply Zone.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

### *3.7.7 Risk of Drought*

**Rationale:** Droughts can cause significant disruptions to feedstock supplies across entire BDO Zones for extended periods of time, especially in the case of agricultural residue and energy crops. Parts of Western Canada are experiencing more frequent and severe droughts, and scientists expect drought to affect new areas across Canada going forward.

Tree species are adapted to specific moisture conditions. Having less water available through drought has a range of negative impacts on the health of forest ecosystems. Direct impacts include reduced growth, increased tree mortality, and failure to regenerate. Indirect impacts include reduced ability to defend against insects and disease and increased fire risk. These impacts can affect the availability of wood fiber for an Issuer.

**Risk Information:** There are no records of drought having significant tree mortality effects in the region.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score** | **Score** |

| | |
|---|---|
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

### *3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds*

**Rationale:** Hurricanes, tornadoes, and strong winds can destroy timber stands, crops, and feedstock piles. They can also delay forestry and agricultural operations. Hurricanes and tornadoes can indirectly cause temporary shortages of available transportation as available trucking moves to handle higher-value disaster-related contracts. For example, Katrina cleanup limited the availability of live-bottom trailers in the North and South East of the US for several months as truckers shifted operations to handle more lucrative government contracts.

Although scientists are uncertain whether climate change will lead to an increase in the number of hurricanes, warmer ocean temperatures and higher sea levels are expected to intensify their impacts.

Recent analyses conclude that the strongest hurricanes occurring in some BDO Zones, including the North Atlantic, have increased in intensity over the past two to three decades.

**Risk Information:** Outreach confirmed that blowdown events are uncommon in the region.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **4** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

### *3.7.9 Risk of Low Temperatures*

**Rationale:** Low temperatures can cause crop failure, leading to shortages of biomass. Additionally, low temperatures can have adverse impacts on the operations of feedstock processing equipment in Northern BDO Zones.

**Risk Information:** Not relevant.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |
| The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

### *3.8 Risk Factor: Political and Social*

#### *3.8.1 Government Subsidies for Feedstock Production or Utilization*

**Rationale:** Feedstock that is directly subsidized through government programs can pose greater long-term risk than feedstock that is not. Subsidies may be subject to amendment or repeal, sometimes with minimal notice.

*NOTE: This risk indicator refers to direct feedstock subsidies only; it does not apply to government subsidies that pertain indirectly to the Issuer's operations, such as Loan Guarantees, or to the markets for products produced by the Issuer*.

**Risk Information:** There are no subsidies for feedstock production and supply in the region.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

#### *3.8.2 Local, Provincial, & National Laws, Regulations, & Permitting Pertaining to Biomass*

**Rationale:** Feedstock whose production is directly dependent on local, provincial, or national laws or government regulations can pose greater long-term risk than feedstock, which is not, since laws and regulations may be subject to amendment or repeal.

If biomass utilization requires specific permits (e.g., percentage removal of forest residue or corn stover, allowable cut limits, air emission, storage permits, rights-of-way, overweight permits for trucks, cross-border permitting for shipment of biomass, chain of custody, or certification of sustainability), the likelihood of obtaining such permits and/or complying with permitting requirements should be examined.

**Risk Information:** There are no regulations or permits that are likely to impact the rated quantities of biomass feedstock.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment. | **Notch**<br>**NN** |

| |
|---|
| *RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *3.8.3 Backlash Against Biomass Development, Procurement, or Usage in the Region*

| |
|---|
| **Rationale:** Public backlash against biomass development in the Issuer BDO Zone can directly impact the Issuer's ability to procure, transport, trans-load, store, or utilize feedstock by affecting local policies, regulations, and the Issuer's ability to obtain necessary permitting. |
| **Risk Information:** Public opposition to forestry has been restricted to occasional media releases by environmental NGOs (e.g., criticism of the pellet industry). There is no evidence that these efforts have led to facility cancellations or wood supply disruptions and therefore risk is assessed as low. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations*

| |
|---|
| **Rationale:** Where new project development on or near Indigenous or First Nation land, or where near Indigenous or First Nations exert influence over feedstock producing areas, consent of, and cooperation with, Indigenous communities and First Nations decreases Issuer risk. |
| **Risk Information:** Not relevant. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). **NR** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed not relevant, therefore the RRI is not rated (NR). **NR** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is not rated. **NR** |
| **Mitigation/Notching** **Notch**<br>The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). **NR** |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. **NR** |

### *3.8.5 Food Security Concerns*

**Rationale:** Despite the fact that any significant correlation between food prices and biofuel production is unclear, claims that biofuel production has driven up food prices, taken food from communities or had a negative impact on land use can fuel public backlash. For example, the removal of biomass may raise public concerns relating to food security if Issuer feedstock requires the use of land that would otherwise be used for growing food.

**Risk Information:** Not relevant.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |
| The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

## *3.9 Risk Factor: Sustainability and Environmental Concern*

### *3.9.1 Feedstock Sustainability*

**Rationale:** Public concerns about the sustainability of feedstock production can jeopardize biomass feedstock operations. Sustainability certification schemes should be utilized where applicable to ensure that feedstock comes from sustainable sources.

Canada leads all countries with 166 million hectares of certified forests, a figure that is nearly four times more than second-place United States at 47 million hectares.

**Risk Information:** The rated quantities are derived from sustainable harvesting levels, as evidenced by the growth-to-drain ratio reported in Section B. Wood processing facilities and timberland owners are certified under nationally and internationally recognized sustainability certification institutions, including the Sustainable Forestry Initiative (SFI), Forest Stewardship Council (FSC), and the American Tree Farm System (ATFS).

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *3.9.2 Risk to Soil Quality*

**Rationale:** Soil sustainability can be defined as the management of soil in a way that does not exert any negative or irreparable effects either on the soil itself or any other systems. There is a diversity of approaches to soil sustainability in jurisdictional guidelines for forest biomass harvesting and production. For different feedstock types, there are also different thresholds at which feedstock removal causes significant negative consequences on the soil.

Poor soil quality that negatively impacts the long-term sustainability of the feedstock can entail long-term feedstock risk. Sub-optimal soil management can leave exposed soil post residue-harvest, which can lead to soil wash-off and soil carbon loss from precipitation and wind. Over-harvesting of biomass also depletes the carbon stock in the soil and creates a negative feedback loop that can degrade the soil and its nutrients.

**Risk Information:** All sustainability certification institutions, including SFI, FSC, and the ATFS, include criteria relevant to soil quality. For example, the SFI has criteria that pertains to erosion control, avoidance of soil contamination, and road and trail construction. Risk is assessed as low.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *3.9.3 Risk to Surface and Groundwater*

**Rationale:** Excessive nutrient runoff from biomass feedstock production can accumulate in surface waters and result in algal blooms and hypoxia, which can lead to habitat loss for aquatic species higher up the food chain and alter aquatic ecosystem food webs. Damage to aquatic ecosystems can cause social and regulatory backlash. Water intake issues can also increase risk.

**Risk Information:** The SFI, FSC, and ATFS include criteria related to water resource conservation, including water quality maintenance, riparian zone protection, and wetlands protection. Risk is assessed as low.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)* | **NN** |

| |
|---|
| No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *3.9.4 Water Use*

| |
|---|
| **Rationale:** Biomass feedstock operations can have significant impacts on the hydrological flux (infiltration, groundwater recharge, interception, and transpiration) of ecosystems. This can lead to water shortages, lower yields, and backlash from regulatory bodies if management plans are not properly instituted. |
| **Risk Information:** Logging activities on private timberlands are subject to the federal Clean Water Act. |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |
| **Mitigation/Notching** **Notch**<br>*RRL Mitigation (Notch)* **NN**<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). |
| **Loaded RI Score** **Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16** |

### *3.9.5 Pesticide Risk to Human and Ecosystem Health*

| |
|---|
| **Rationale:** Application of pesticides (i.e., herbicides, fungicides, and insecticides) on agricultural and forest landscapes can result in adverse health effects for humans and ecosystems. If pesticide application is required in feedstock production, the impact must be considered in the BDO Zone rating. |
| **Risk Information:** Pesticide use on private and public timberlands in MS and AL is governed by regulations and guidelines developed by third-party sustainability institutions (e.g., SFI, FSC, ATFS) and by state and federal levels of government. The Mississippi State University Extension provides detailed guidelines for proper use and monitoring of pesticide applications so as to minimize environmental impacts.[25] |
| **Raw Risk Likelihood (RRL)** **Score**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4** |
| **Raw Risk Impact (RRI)** **Score**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. **4** |
| **Gross Risk Indicator (GRI)** **Score**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16** |

[25] http://extension.msstate.edu/publications/forest-herbicide-safety-environmental-concerns-and-proper-handling

| Mitigation/Notching | Notch |
|---|---|
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | NN |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

### *3.9.6 Risk to Wildlife and Landscape*

**Rationale:** Biomass production and supply chain operations with negative impacts on wildlife and landscape are at a greater long-term risk of encountering project setbacks and disruptions.

**Risk Information:** Federal regulations that have bearing on forestry activities on private lands, including the Clean Water Act and the Endangered Species Act, have no significant impact on wood supply in Mississippi and Alabama. Harvesting on federal forestlands is subject to environmental impact assessment and other requirements under the National Environmental Protection Act (NEPA).

| Raw Risk Likelihood (RRL) | Score |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 8 out of 100. | **8** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100. | **8** |

### *3.9.7 Biomass Classified as Genetically Modified Organism (GMO)*

**Rationale:** There are various risks associated with GMOs, such as migration or dispersion across the landscape, which can generate community backlash and create supply chain risk. GMOs can also be heavily regulated. If planning to grow or procure GMO feedstocks, especially purpose-grown energy crops, it is important to understand the risks.

**Risk Information:** Not relevant.

| Raw Risk Likelihood (RRL) | Score |
|---|---|
| The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). | **NR** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed not relevant, therefore the RRI is not rated (NR). | **NR** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is not rated. | **NR** |
| **Mitigation/Notching** | **Notch** |

| | |
|---|---|
| The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). | **NR** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. | **NR** |

## CATEGORY 4.0: FEEDSTOCK SCALE-UP RISK

### *4.1 Risk Factor: Feedstock Scale-Up*

#### *4.1.1 Feedstock Quality at Production Scale*

**Rationale:** The physical and chemical properties of feedstock used in lab, pilot, and field testing can fail to be representative of feedstock generated by large-scale operations.

It is important to conduct tests on feedstock representative of that which will be produced by large-scale operations. Failure to adequately test the full range of parameter values can result in severe problems during scale-up.

**Risk Information:** If proper feedstock management practices are followed, pulpwood and sawmill residual quality issues are unlikely to arise. The quality of sawmill residue and pulpwood is managed through routinized procedures. However, forestry professionals in the region are unfamiliar with in-woods chipping, increasing the likelihood of forest residue quality issues.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

#### *4.1.2 Capacity of Supply Chain Components & Equipment to Scale*

**Rationale:** Scale-up risk increases if supply chain components or underlying feedstock infrastructure necessary for these components cannot scale to handle Issuer feedstock requirements and throughput capacity. Capacity to scale should be demonstrated.

**Risk Information:** As reported in Section B, accessing the rated quantity of biomass would require approximately 40 dedicated logging crews, four-to-six forestry companies specialized in mobile chipping/grinding, and a total of 95 logging trucks, 20 chip trucks, and associated drivers. This is a significant scale-up risk given the existing regional logging and trucking capacity. Current capacity is often insufficient to meet wood supply demands, leading to delivery delays. Prospects of long-term workforce recruitment and retention are improved due to the presence of training institutions in the region, in particular the Logging Equipment Operator Academy hosted by Hinds Community College in Raymond, MS. A new project proponent willing to proactively support logging and trucking workforce development would likely expedite the rate of scale-up. Note also that logging companies are unlikely to invest in chipping/grinding units without long-term supply agreements.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed high, therefore the RRL is 8 out of 10. | **Score**<br>**8** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed high, therefore the RRI is 8 out of 10. | **Score**<br>**8** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 64 out of 100. | **Score**<br>**64** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>There are a number of proactive workforce development institutions and programs present in the region. The Forestry Works! Initiative, led by the Forestry Workforce Training Institute and industry partners, has the goal of ensuring a long-term supply of qualified workers for the logging and wood product manufacturing industries. The Alabama Department of Commerce Workforce Development, Alabama Industrial Development Training, and community colleges and universities in Alabama and Mississippi also provide services and programs that encourage forestry workforce development.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**25%** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100. | **Score**<br>**48** |

## CATEGORY 5.0: INFRASTRUCTURE RISKS

### *5.1 Risk Factor: Physical Infrastructure*

*5.1.1 Land Parcel/Industrial District*

**Risk Information:** The evaluated site is a 33.6-acre, polygon-shaped parcel located in the Weyerhaeuser Industrial Park on the southern edge of Scooba, MS. The property was previously owned by Weyerhaeuser and is currently used for log storage. The site has favorable industrial zoning, access to major road, rail, and marine transportation infrastructure, and on-site utilities. Maps showing the location and attributes of the site are shown in Section E. Overall, the site represents a low risk to developers seeking a buildable site within the BDO Zone.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *5.1.2 Ownership of Land*

**Risk Information:** The parcel is owned by the Kemper County Board of Supervisors. The Board offers a streamlined and consistent approach to land transactions, reducing potential acquisition complications

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

### *5.1.3 Permitting Description*

**Risk Information:** Environmental permitting is handled by the Mississippi Department of Environmental Quality (MDEQ). The US Environmental Protection Agency (EPA) has delegated virtually all environmental monitoring for such facilities to the MDEQ. Kemper County has no regulations relevant to biomass or chemical facilities. Permitting issues are unlikely to arise for new projects due to the presence of chemical-based industrial facilities located within a five-mile drive distance of the Weyerhaeuser Industrial Park, along Highway 45.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **Score**<br>**2** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **Score**<br>**2** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **Score**<br>**4** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **Score**<br>**4** |

### *5.1.4 Environmental Issues*

**Risk Information:** Kemper County has proactively sought funding for a new Phase 1 Environmental Assessment on the site, confirming its commitment to maintaining environmental safety standards for future industrial development. Historical and recent inspections indicate no known environmental issues that would restrict new construction, and the

site's location in an air attainment area and absence of flood risks make it suitable for development from an environmental standpoint.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 24 out of 100. | **24** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100. | **24** |

## *5.2 Risk Factor: Utilities*

### *5.2.1 Natural Gas Availability*

**Risk Information:** The ongoing construction of natural gas services by the Kemper County Utility District, connecting Tennessee Valley Authority's (TVA) gas turbine facility on State Highway 16 to Scooba and Highway 45 site areas, represents a substantial infrastructure improvement. With a $1.5 million investment in collaboration with Kinder Morgan, this project enables a reliable natural gas supply to the area, Note that new construction may incur connection fees for new services. Mississippi's natural gas prices are some of the lowest in the country (less than $6/mcf)[26] therefore overall risk is deemed to be low.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **16** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **16** |

[26] https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SMS_m.htm

### *5.2.2 Electric Availability*

**Risk Information:** Electricity requirements at the Weyerhaeuser Industrial Park are served by East Mississippi Electric Power (EMSEP), powered by the Tennessee Valley Authority (TVA). A 25kV power line along the eastern parcel border provides 5 MW of available capacity, suited for small to moderate energy demands. For larger operations, the 46kV transmission line on the northern edge and its associated substation are undergoing upgrades to 161kV service, with more than 25 MW of capacity. This configuration offers flexibility and can accommodate industries with substantial energy needs.

Mississippi's average electricity rate of 11.12 cents per kWh (June 2024) includes Kemper County and ranks as the 22nd lowest in the nation, slightly under the national average.[27] This competitive rate further supports operational cost efficiency for energy-reliant industries. For new industrial tenants, the combination of scalable power capacity, competitive rates, and the ongoing infrastructure upgrades help mitigate any risk related to energy scalability or cost unpredictability.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **4** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

### *5.2.3 Water Availability*

**Risk Information:** Industrial water supply to the Weyerhaeuser Industrial Park is managed by the Porterville Water Association and is competitively priced for industrial customers. Water in Kemper County comes from a number of sources, including wells, publicly owned treatment works (POTWs), and the Lower Wilcox Aquifer. The 6" delivery line along the eastern border of the industrial property is a notable asset, as it provides a dependable source for industries with moderate water needs. This pipeline is typically capable of handling smaller to mid-sized manufacturing and bio-economy operations, offering a steady flow for processing, cooling, and general operations.

For industries requiring significant water volume, however, the 6" line may necessitate upgrades or the addition of storage facilities on-site to ensure peak demand is met without overextending the current supply. New industries are advised to collaborate directly with the Porterville Water Association to discuss potential capacity upgrades or assurance plans.

| **Raw Risk Likelihood (RRL)** | **Score** |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |

[27] https://www.eia.gov/electricity/state/mississippi/

| | |
|---|---|
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *5.2.4 Waste Disposal*

**Risk Information:** Sanitary sewer service is not currently provided to the site. However, the Town of Scooba is currently upgrading their sewer facilities. They have agreed to work with the Kemper County Board of Supervisors and Economic Development Authority as well as Mississippi Development Authority to treat sewage transported to the town by pumping station and force main.

Kemper County Landfill Company is a subsidiary of Waste Pro of Mississippi, Inc. operating a landfill approximately eight miles from the site. Waste Pro provides commercial and residential solid waste and recycling collection.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *5.2.5 Internet Availability*

**Risk Information:** Kemper County's extensive communications network is supported by major providers like AT&T, Spectrum, and Xfinity. Wireless and fiber options are capable of delivering speeds of up to 5 Gbps, enabling data-intensive operations. The presence of multiple providers ensures competitive pricing.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)** | **Score** |

| | |
|---|---|
| The risk impact is deemed low, therefore the RRI is 4 out of 10. | **4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

## *5.3 Risk Factor: Transportation/Logistics*

### *5.3.1 Road/Highway Access*

**Risk Information:** The Weyerhaeuser Industrial Park benefits from strong logistical accessibility, primarily due to its proximity to State Highway 45, a major four-lane thoroughfare running from the Gulf Coast to Canada. Interstate 20, located 35 miles to the south, connects the site to the U.S. interstate road network.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *5.3.2 Rail Access*

**Risk Information:** The Canadian Pacific Kansas City Southern (KCS) Railroad's mainline along the eastern border of the Weyerhaeuser Industrial Park is a significant asset for industries in Kemper County, especially those requiring integrated rail and ocean transport solutions. Direct rail access to Gulf Coast cities and ports offers new industries efficient freight movement for raw materials and finished products, opening doors to domestic and international markets.

New projects that locate at the evaluated site will need to establish a commercial rail spur. This involves a minimum six-month permitting process, followed by a year for build-out. This timeline should be factored into operational planning for industries heavily reliant on rail logistics. Once completed, these spurs will provide customized, direct access to the mainline.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |

| | |
|---|---|
| The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *5.3.3 Airport Access*

**Risk Information:** Proximity to the Meridian Regional Airport, just 45 miles south of Scooba, MS, is a logistical advantage for new industries establishing operations in the area. Daily direct flights (passenger and commercial) to Houston and Memphis are available through United Express, enabling convenient employee travel and time-sensitive freight movement. Air connection to Houston also facilitates access to wider domestic and international networks, benefiting industries with extended supply chains or frequent client and partner visits. For more extensive passenger options, Birmingham International Airport is 155 miles (or a 2.5-hour drive) from Scooba.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | **Score**<br>**16** |

### *5.3.4 Water Freight Access*

**Risk Information:** The Tombigbee Waterway, located 33 miles east of Scooba, MS, is a significant logistical asset for industries requiring water or ocean freight access. This navigable waterway connects the Tennessee River to the Gulf Coast near Mobile, AL, providing a transportation route for regional commodities.

For new industries in Kemper County, proximity to the Tombigbee Waterway enables efficient shipping of large or bulk goods, reducing transportation costs and streamlining supply chain logistics. Access to this waterway enhances Scooba's

appeal by offering versatile transport options beyond traditional road and rail, making it easier to reach Gulf Coast ports for broader distribution and export.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | **2** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | **2** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | **4** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

## *5.4 Risk Factor: Social Infrastructure*

### *5.4.1 Healthcare (Local)*

**Risk Information:** Healthcare and emergency medical services in the Scooba area are limited, which may pose a higher risk factor for new industries considering employee well-being. While a local Family Medical Clinic provides basic care, its lack of weekend coverage can be a concern for employees requiring urgent assistance outside regular hours. For comprehensive medical and surgical care, the nearest hospitals—Regency and Anderson Regional—are located in Meridian, MS, 45 miles away, necessitating travel for more serious health needs.

In emergencies, Life Care EMS offers both ground and air ambulance services to Scooba, ensuring access to critical care despite the distance. However, this arrangement may be seen as a drawback for potential employees, particularly those with families or ongoing medical needs.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **36** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **36** |

### *5.4.2 Education (Schools)*

**Risk Information:** The education system in Scooba, MS, managed by Kemper County Public Schools, serves approximately 450 students[28] across elementary, middle, and high school levels. The District has a national ranking at 30th percentile in quality and graduation rates, which in in the lower half of similar sized school systems

Scooba is home to East Mississippi Community College, which offers two-year certification programs and vocational training, supporting workforce development in skilled trades. Additionally, the remote campus of Mississippi State University in Meridian, just 45 miles away, provides four-year degrees in agriculture, engineering, social sciences, and health services.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **Score**<br>**6** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **Score**<br>**6** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **Score**<br>**36** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |
| **Loaded RI Score**<br>The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **Score**<br>**36** |

### *5.4.3 Local Transportation*

**Risk Information:** Despite its small size, Scooba, MS, has reliable public transportation options, enhancing connectivity to surrounding areas and benefiting local residents and industries alike. The Kemper County Transit,[29] operated by the City of Meridian, offers regular bus services between Scooba and Meridian. Scooba also has taxi services that offer direct routes within the town or to nearby areas.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)**<br>The risk likelihood is deemed low, therefore the RRL is 4 out of 10. | **Score**<br>**4** |
| **Raw Risk Impact (RRI)**<br>The risk impact is deemed low, therefore the RRI is 4 out of 10. | **Score**<br>**4** |
| **Gross Risk Indicator (GRI)**<br>The Gross Risk Indicator (RRL X RRI) is 16 out of 100. | **Score**<br>**16** |
| **Mitigation/Notching**<br>*RRL Mitigation (Notch)*<br>No adjustment.<br>*RRI Mitigation (Notch)*<br>No adjustment.<br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **Notch**<br>**NN** |

[28] https://www.niche.com/k12/kemper-county-high-school-dekalb-ms/#students
[29] https://www.transitlink.org/ms/kemper-co

| Loaded RI Score | Score |
|---|---|
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. | 16 |

[30]

### *5.4.4 Public Safety (Local)*

**Risk Information:** The Scooba area has a higher-than-average crime rate of 28%, above the national average for both violent and property crimes

The Kemper County Sheriff's Office provides oversight and emergency response within the community. While the Office provides essential services, prospective employees might still view crime as a risk factor

| Raw Risk Likelihood (RRL) | Score |
|---|---|
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | 6 |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | 6 |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | 36 |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | NN |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | 36 |

### *5.4.5 Housing/Cost of Living*

**Risk Information:** The cost of living in Scooba, MS is very affordable, rated at 73.4 with 100 being the national average.[31] Housing costs are 26% below the national average.[32] This affordability extends to other essentials, such as groceries and utilities, which are also more economical compared to national averages.

| Raw Risk Likelihood (RRL) | Score |
|---|---|
| The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. | 2 |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed very low, therefore the RRI is 2 out of 10. | 2 |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 4 out of 100. | 4 |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment. | NN |

[30] https://www.areavibes.com/scooba-ms/crime/
[31] https://www.bestplaces.net/cost_of_living/city/mississippi/scooba
[32] https://www.salary.com/research/cost-of-living/scooba-ms

| | |
|---|---|
| The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. | **4** |

### *5.5 Risk Factor: Labor*

#### *5.5.1 Workforce*

**Risk Information:** In Scooba, MS, workforce availability reflects a small, rural community with a limited local labor pool, particularly for specialized roles. Local Unemployment is 4.8%.[33] Many local workers may possess skills suited to traditional sectors, such as forestry, agriculture, trade, and technical fields. For industries requiring skilled labor or specific certifications, East Mississippi Community College (located in Scooba) provides workforce training and certification programs

Scooba's proximity to Meridian (45 miles south) expands potential recruitment by tapping into a broader labor market with a range of skills and educational backgrounds. However, depending on the industry, employers may need to provide additional training programs or partner with educational institutions to help meet specific workforce needs.

| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed high, therefore the RRL is 8 out of 10. | **8** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |
| **Gross Risk Indicator (GRI)** | **Score** |
| The Gross Risk Indicator (RRL X RRI) is 48 out of 100. | **48** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100. | **48** |

#### *5.5.2 Labor Costs*

**Risk Information:** The cost of labor in Scooba, MS, lower than major metropolitan areas. As of July 2024, the minimum wage in Mississippi is $7.25 per hour,[34] the same as the federal minimum wage. While entry-level workers, skilled equipment operators, and millwrights are likely to be sourced at competitive rates, specialized labor required for advanced bioproduct manufacturing may be more difficult to procure due to the remoteness of the region. The nearest large cities are Jackson, MS and Birmingham, AL, located over 120 miles from Scooba. Companies should consider the need for ongoing training and potential incentives to attract and retain skilled workers.

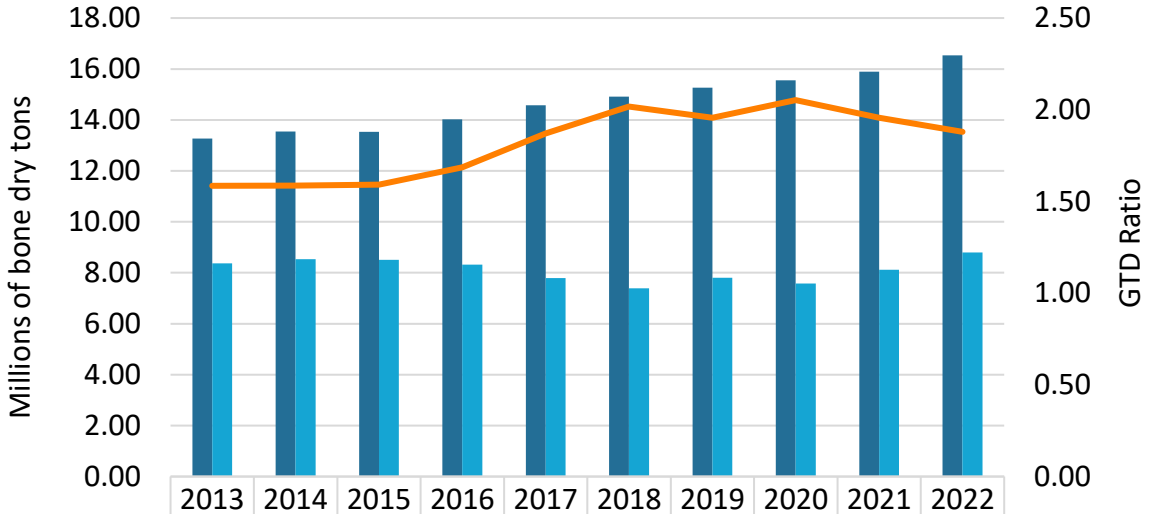
| | |
|---|---|
| **Raw Risk Likelihood (RRL)** | **Score** |
| The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. | **6** |
| **Raw Risk Impact (RRI)** | **Score** |
| The risk impact is deemed medium, therefore the RRI is 6 out of 10. | **6** |

[33] https://fred.stlouisfed.org/series/MSKEMP9URN
[34] https://www.workstream.us/wage-index/mississippi

| **Gross Risk Indicator (GRI)** | **Score** |
|---|---|
| The Gross Risk Indicator (RRL X RRI) is 36 out of 100. | **36** |
| **Mitigation/Notching** | **Notch** |
| *RRL Mitigation (Notch)*<br>No adjustment.<br><br>*RRI Mitigation (Notch)*<br>No adjustment.<br><br>The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). | **NN** |
| **Loaded RI Score** | **Score** |
| The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. | **36** |

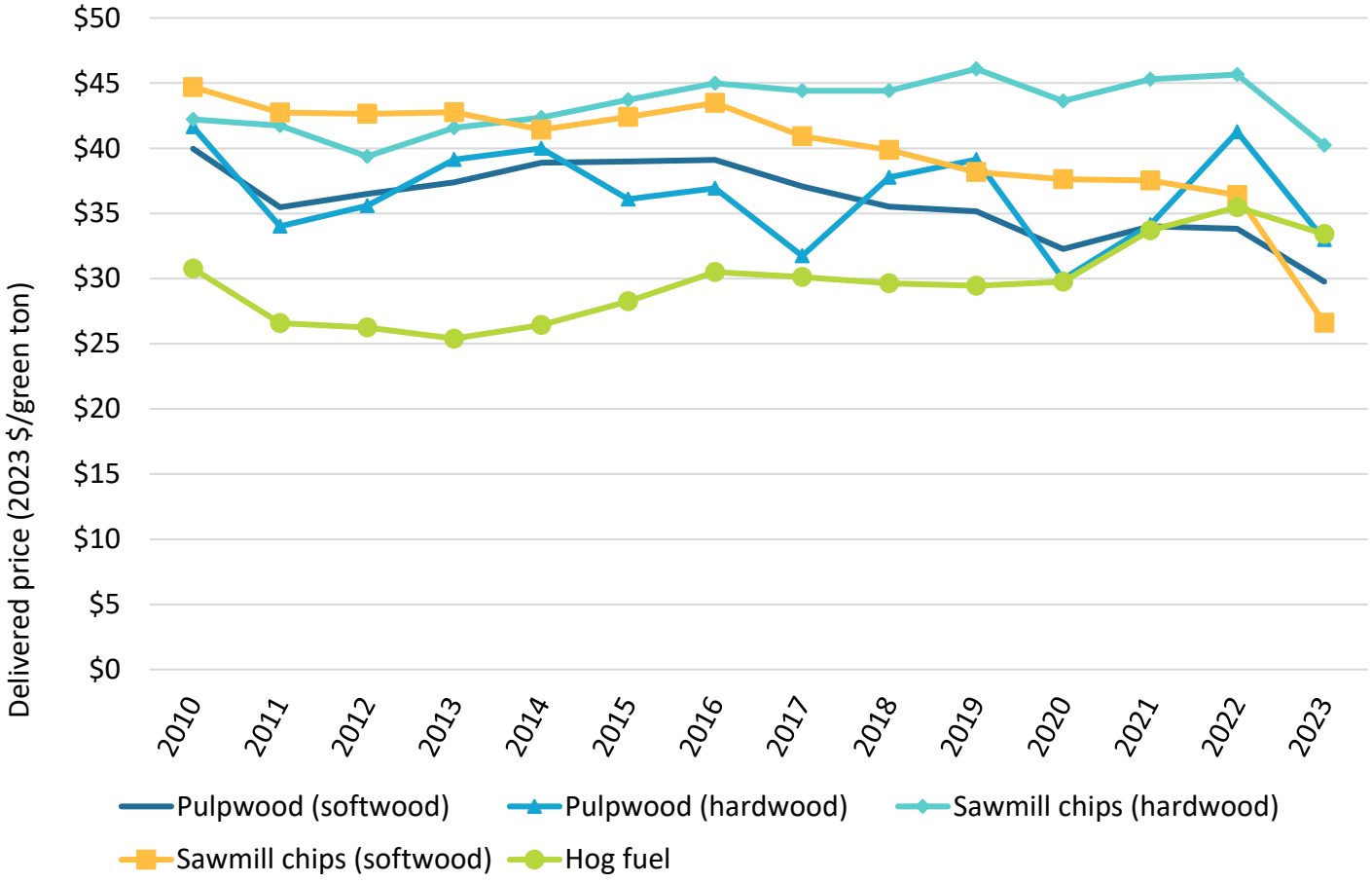
## SECTION E: TABLES AND FIGURES

**Figure E-1. Average Annual Net Growth, Harvesting Removals, and Growth-to-Drain Ratio**




| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|
| Annual net growth | 13.27 | 13.55 | 13.53 | 14.02 | 14.57 | 14.91 | 15.27 | 15.56 | 15.89 | 16.54 |
| Annual harvest removals | 8.37 | 8.54 | 8.51 | 8.32 | 7.79 | 7.39 | 7.81 | 7.58 | 8.13 | 8.79 |
| Growth-to-Drain Ratio | 1.59 | 1.59 | 1.59 | 1.69 | 1.87 | 2.02 | 1.96 | 2.05 | 1.96 | 1.88 |

**Figure E-2. Delivered Prices for Forestry Feedstock in Southeastern Mississippi[35]**




[35] Region MS2, TimberMart South data. FOB prices converted to delivered prices on basis of a $9/green ton transportation cost @50 miles.

**Figure E-3. Sawmill Capacity in the Supply Zone, 2012-2024**

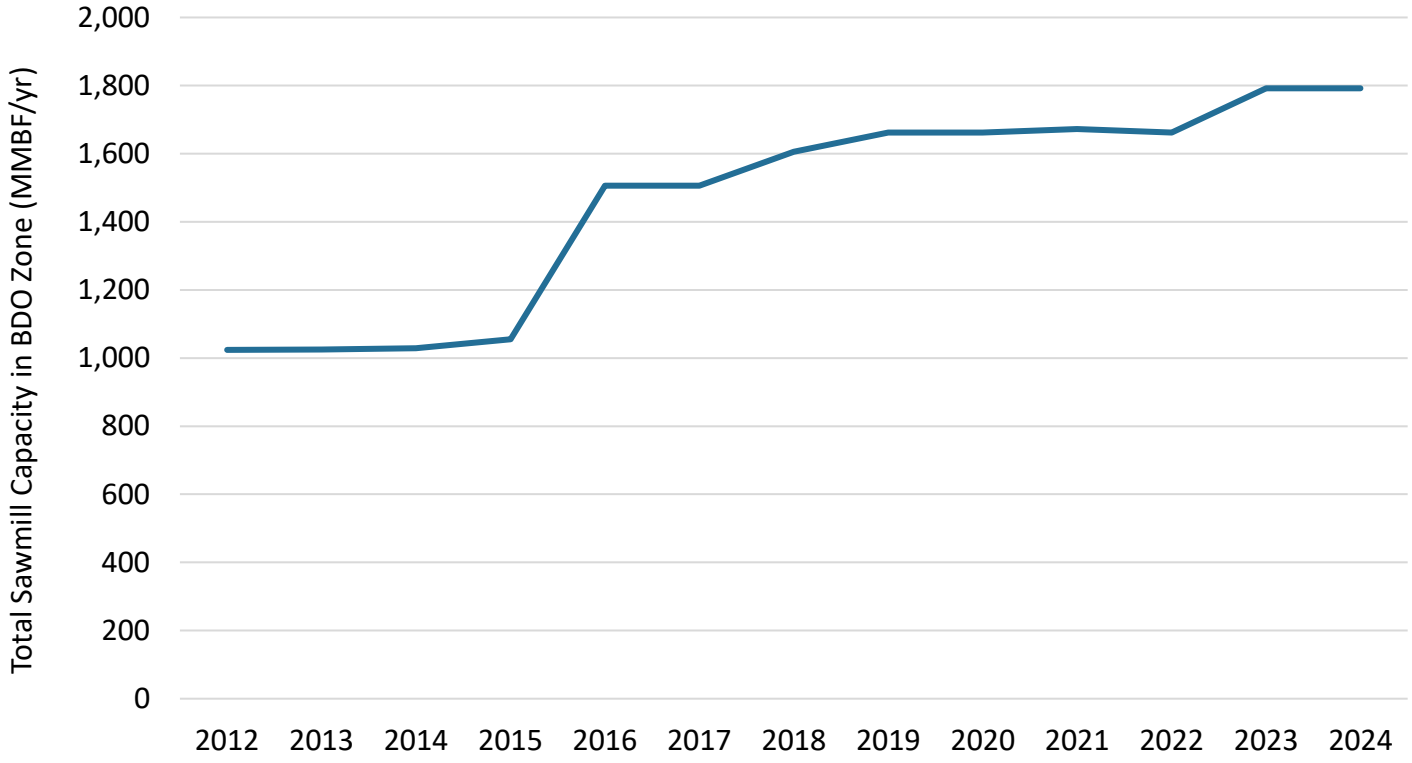


**Figure E-4. Growth in the Capacity of Pulp-Paper and Pellet Production Capacity, 2013-2025**

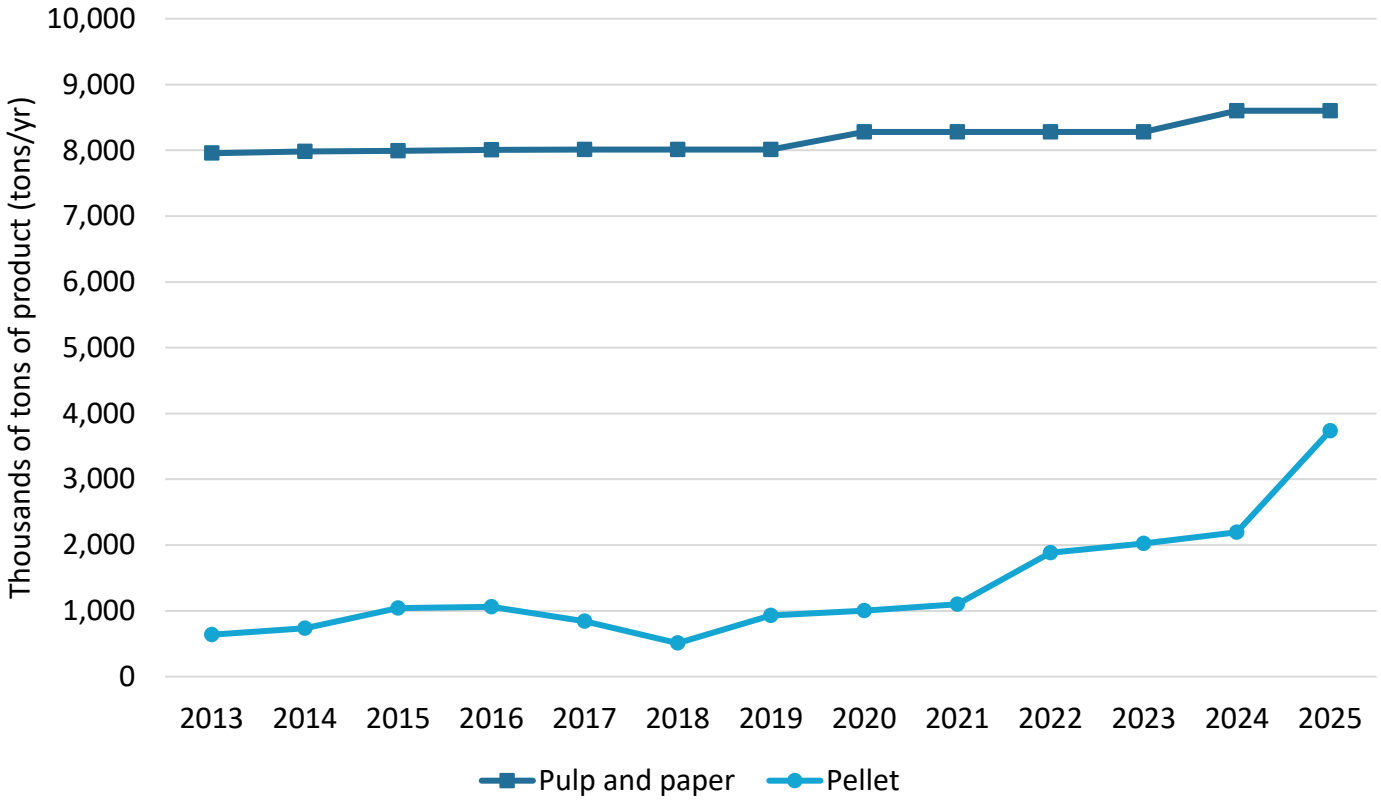


**Figure E-5. Supply Curve for Pulpwood and Sawmill Residue Produced within 75 miles of Scooba, MS**

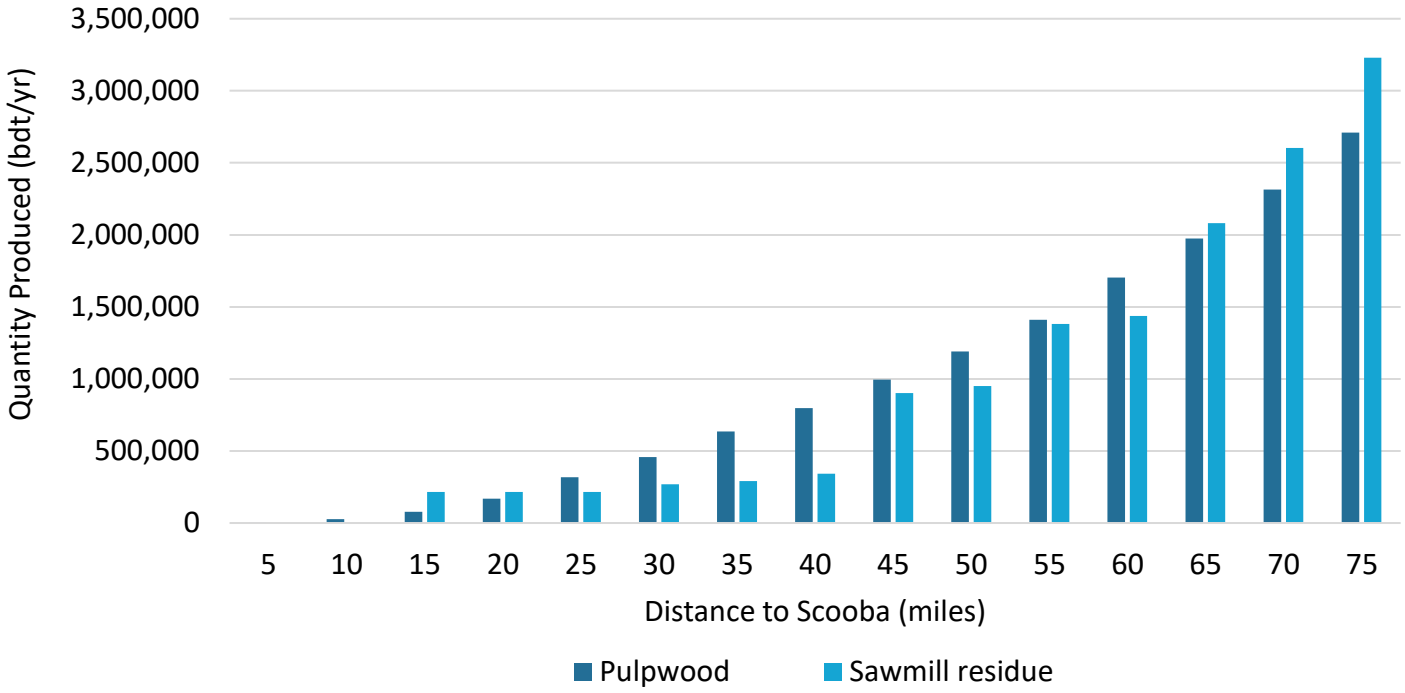


**Figure E-6. Marginal Cost Curve for Pulpwood in the Supply Zone**

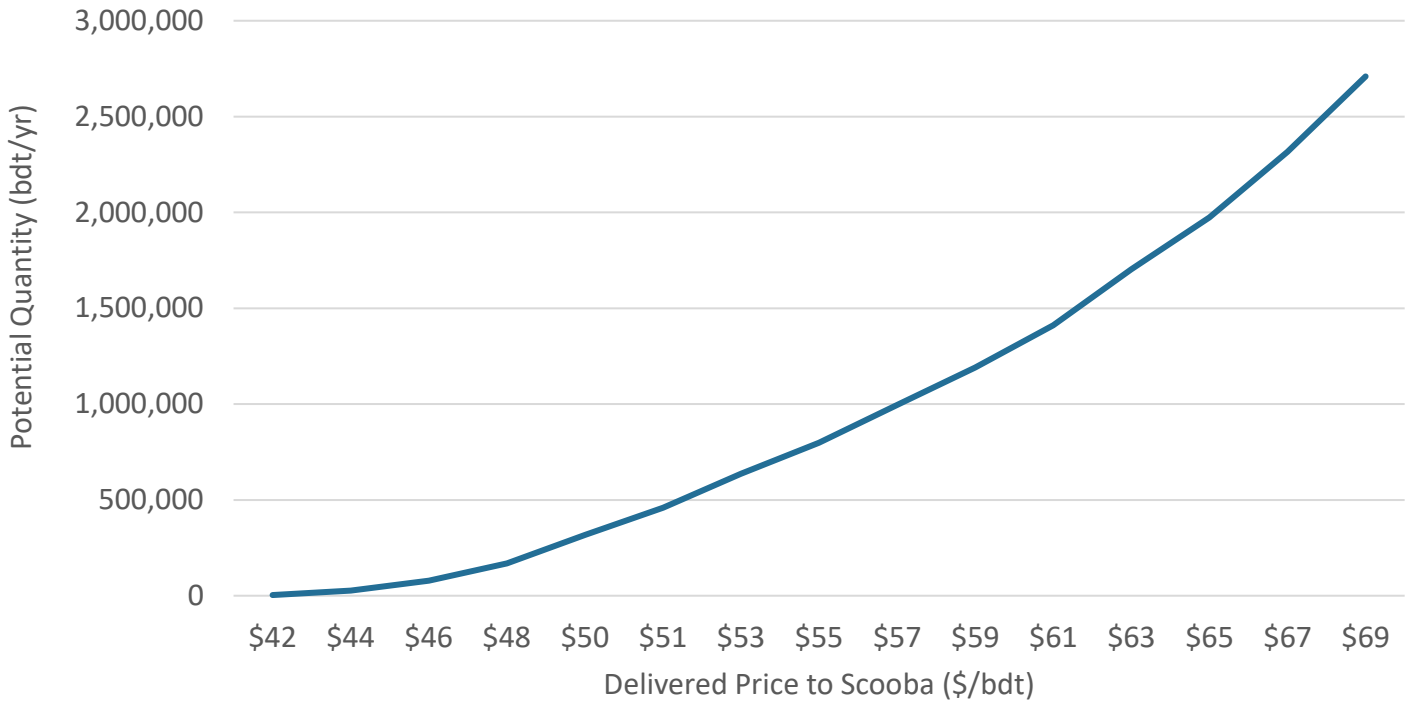


**Figure E-7. Comparison of Diesel Prices in Gulf Coast PADD 3 and the USA, 1995-2023**

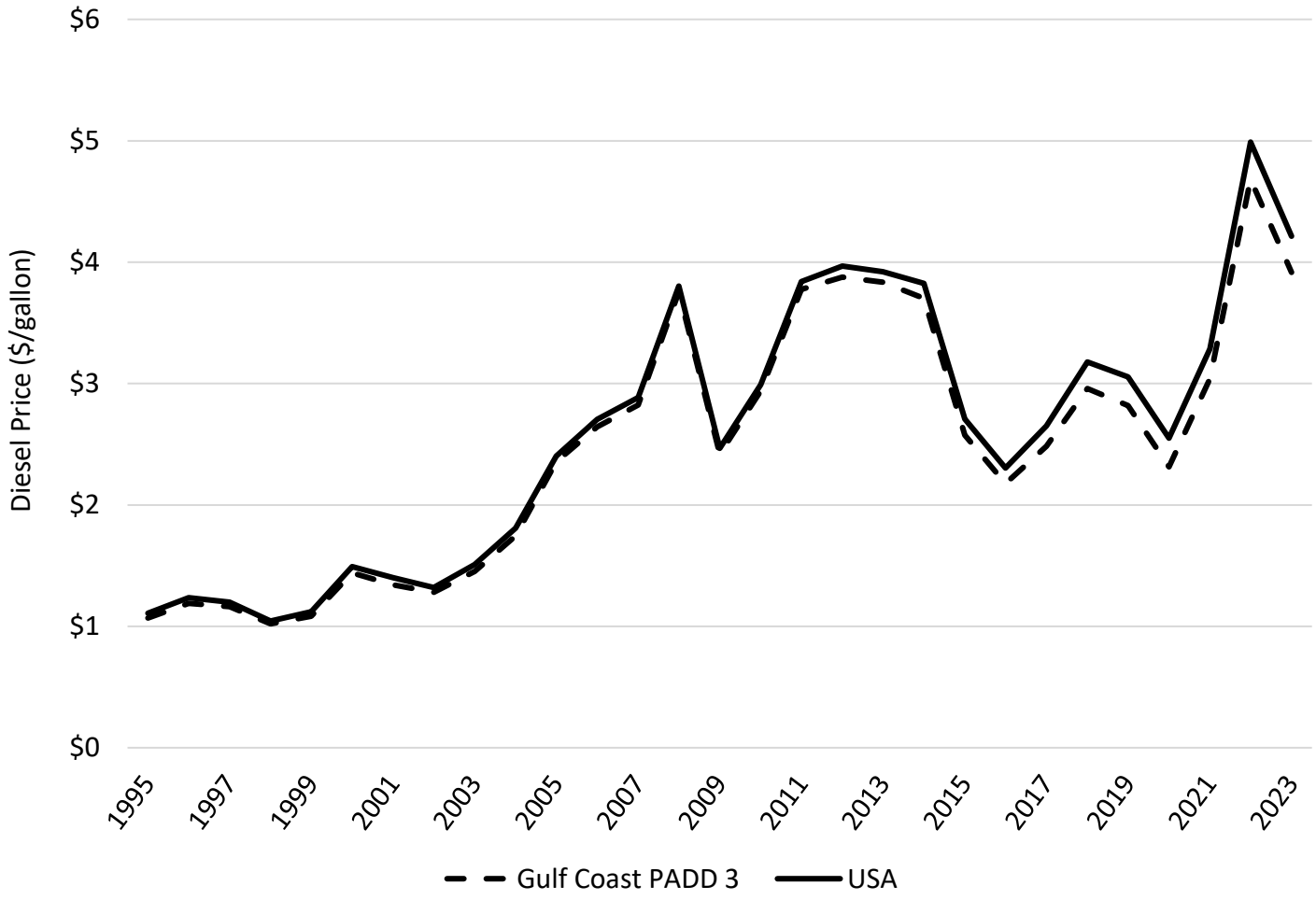


**Figure E-8. Inflation-Adjusted Diesel Prices in the Gulf Coast PADD 3, 1995-2023**

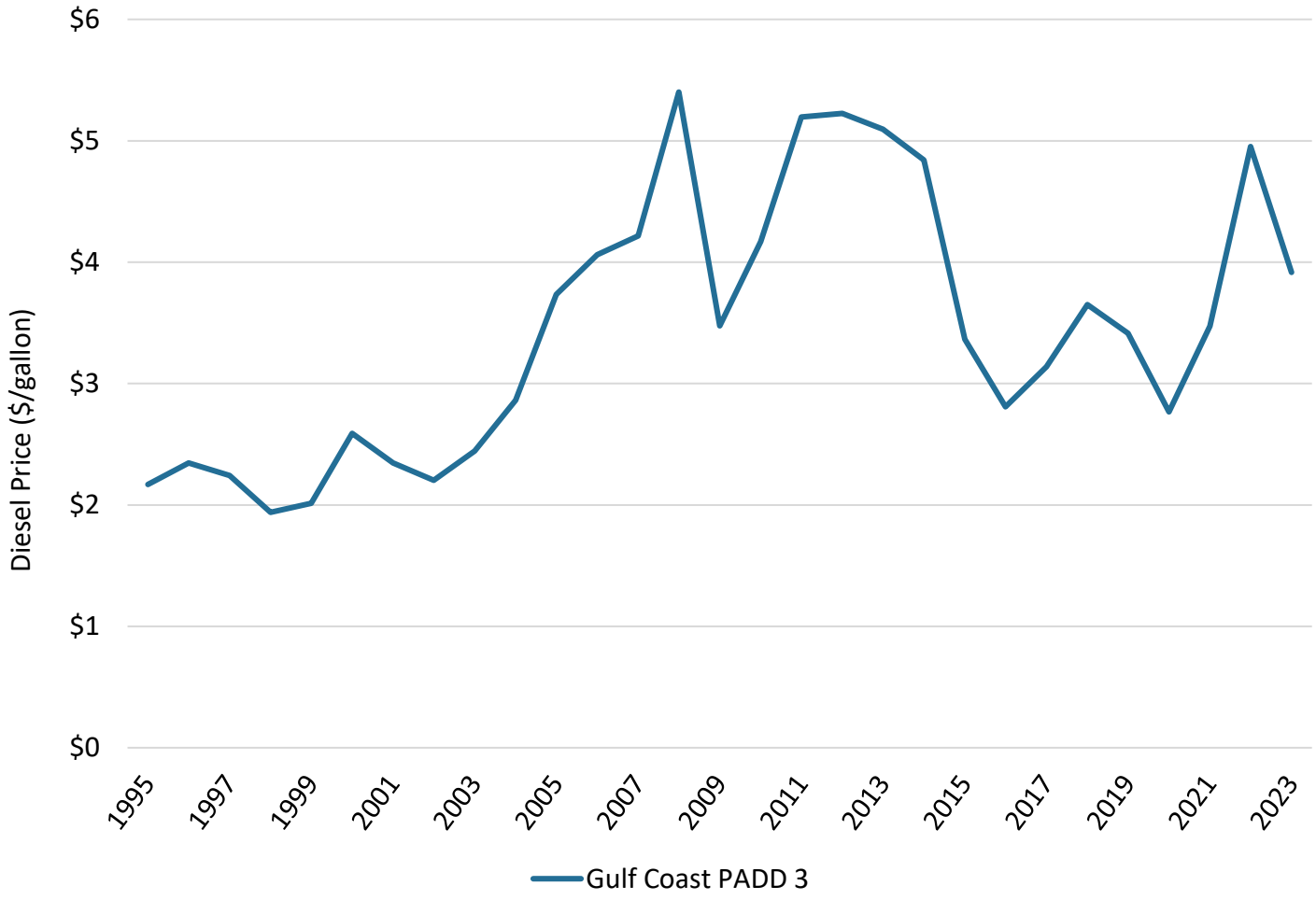


**Figure E-9. Location of Kemper County in Mississippi**

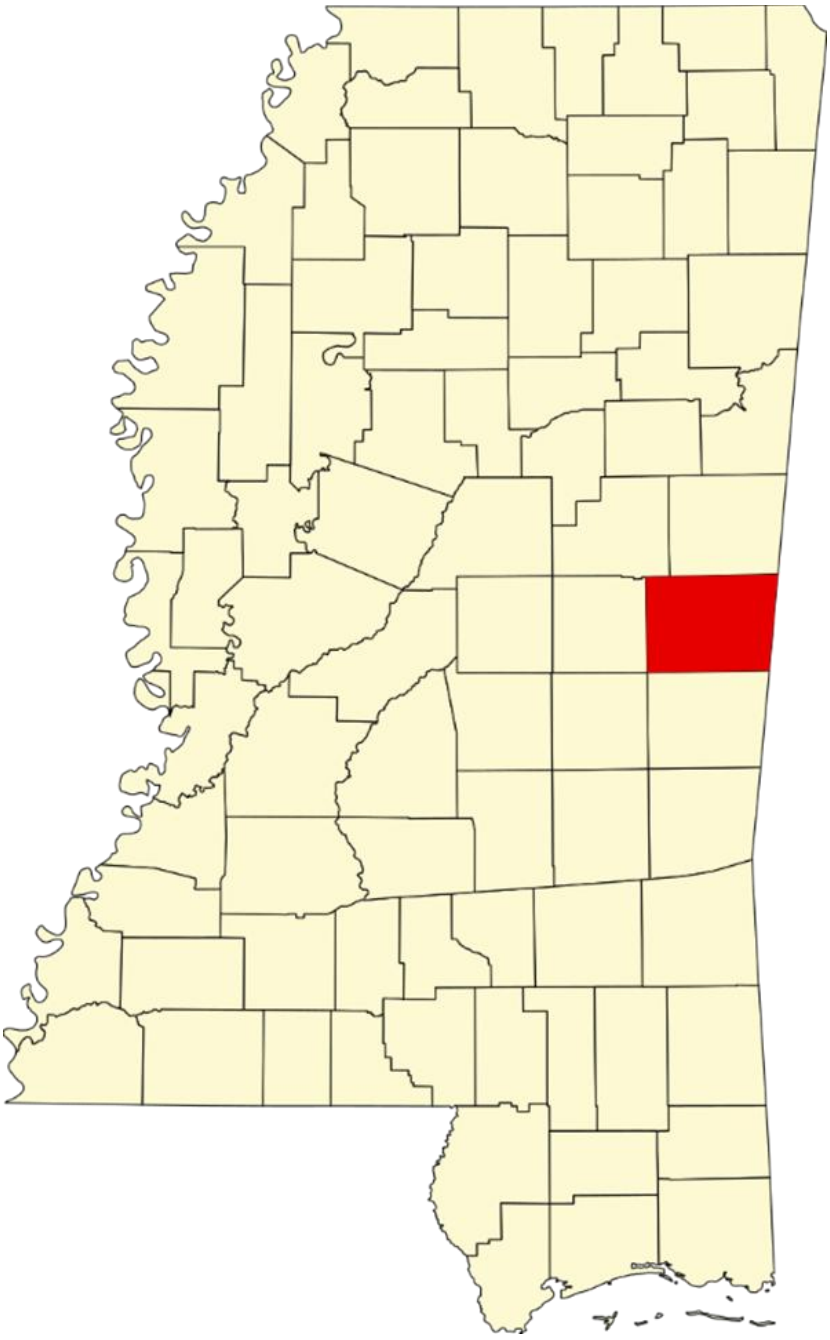


**Figure E-10. Location of Evaluated Site in Relation to Scooba and Highway 45**

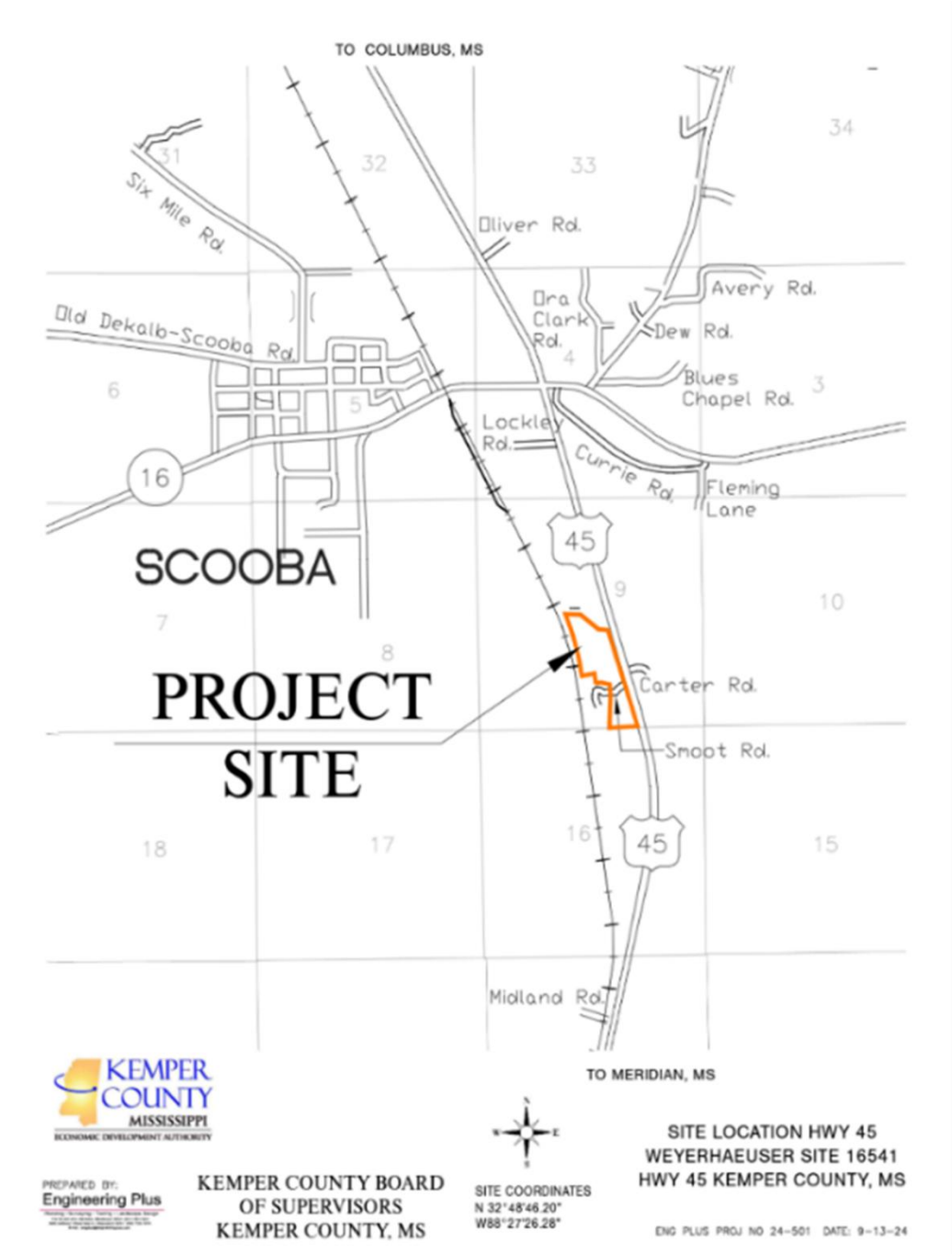


**Figure E-11. Planning Map of 34-Acre Parcel in Weyerhaeuser Industrial Park**

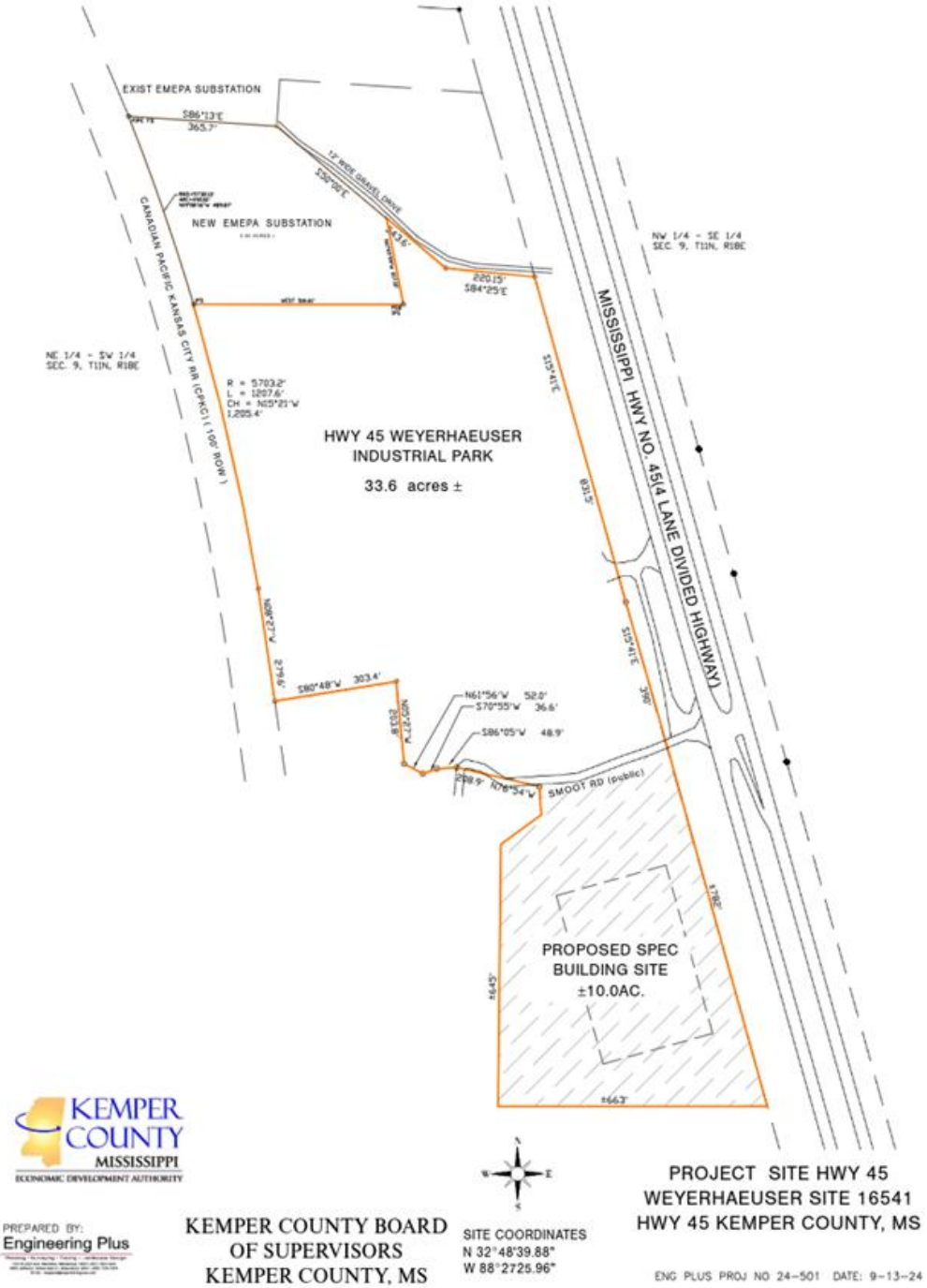


**Figure E-12. The Tombigbee Waterway in Relation to the Tombigbee River and Gulf Coast**



## SECTION F: LEGAL DISCLAIMER

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