PLACER COUNTY, CA

Biofuel Development Opportunity Zone

RATING GRADE: 'A'

Date of Issue: September 9, 2025

A
High Quality

Rating Parameters:

Category	Rated Quantity	Delivered Price	Supply Zone Size
Pulpwood	48,700 bdt/yr	$75-$95/bdt	75-mi drive distance
Forest Residues	25,900 bdt/yr	$80-$100/bdt	from Ophir, CA

BDO ZONE ASSETS

- 74,600 bdt/yr of woody biomass potentially available at low risk, with three times as much potentially available with higher risk profile.
- Minimal competition for available Pulpwood due to the absence of pulp and paper mills, leading to limited competitive pressure on pricing.
- A strong local support for utilization of biomass from regional forest restoration and wildfire fuel removal activities.
- A unique opportunity for joint development with the Placer County Water Agency (PCWA), which intends to use biomass to power its water treatment processes.

BDO ZONE LIABILITIES

- Potential fluctuations in biomass quality and quantity arising from forest restoration, salvage, and wildfire mitigation activities.
- Higher utility and labor costs compared to national averages, and a high cost of living, potentially increasing operational expenses and affecting workforce recruitment and retention.

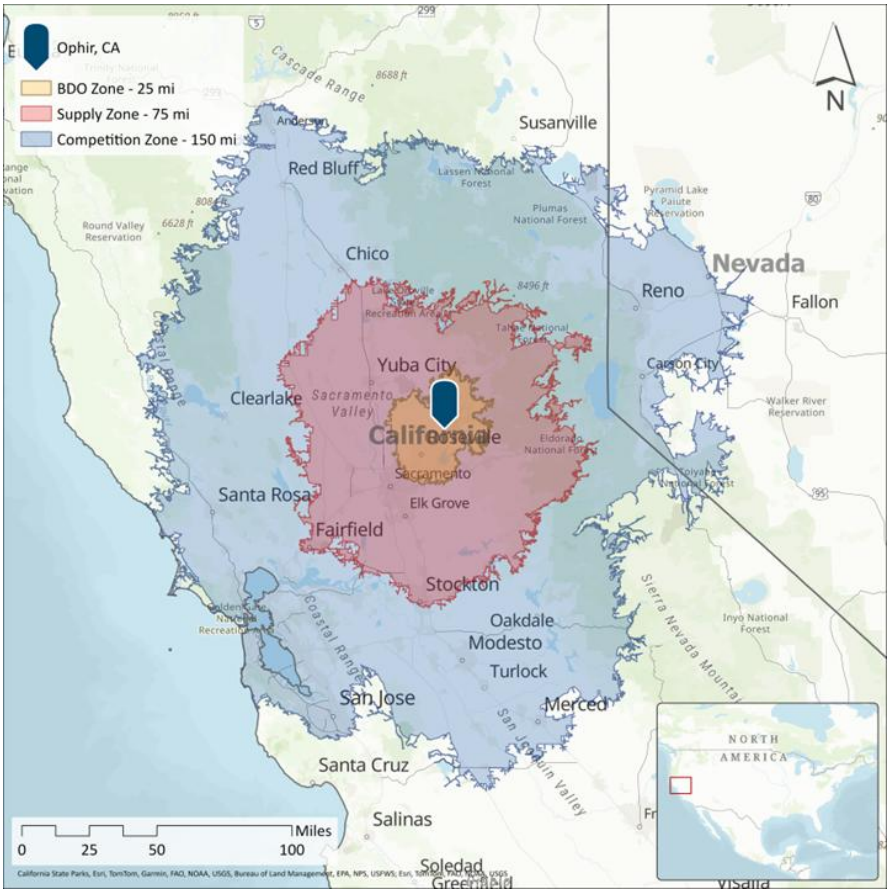
RATING GRADE

The Placer County, CA, Biofuel Development Opportunity Zone, is rated 'A', or 'low' risk.

Risk Rating Grades are defined as follows: AAA (extremely low risk), 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 community-scale plant operations is considered strong.

PLACER COUNTY, CALIFORNIA BDO ZONE



ANALYST NOTES

The Placer County Supply Zone encompasses approximately 8,910 square miles. The region's forests are predominantly softwoods, with pine and fir accounting for over 90% of tree species. The assessment highlights that forest stands exhibit substantial annual net growth, with a robust growth-to-drain (GTD) ratio of 3.3 for all live trees and 2.0 for Pulpwood. This indicates a highly sustainable harvest level and significant potential for additional biomass availability. While public ownership holds a larger share of timberland (59%), private lands contribute more to actual timber removal (52%), presenting a mixed but manageable sourcing landscape.

BDO ZONE ASSETS

A key asset for the Placer County BDO Zone is the strong local commitment to developing a community-scale bioeconomy. This initiative specifically targets biomass generated from forest restoration and fire remediation activities, aligning well with recent national and state legislative measures that provide incentives for these feedstocks.

Placer County promotes biomass access through its Wildfire Protection and Biomass Utilization Program, which encourages removal of excess woody material to reduce wildfire risk and air pollution, often converting it to energy feedstock. The county supports wildfire fuel removal through several efforts, including individual and countywide Community Wildfire Protection Plans (CWPPs); the countywide Local Hazard Mitigation Plan (currently being updated in 2025); and fuel reduction programs, including the Wildfire and Forest Resilience 10-year Action Plan.

The region benefits from a long-standing history of logging operations. The absence of pulp and paper mills in the Competition Zone results in minimal competitive demand for Pulpwood, a favorable condition for new projects. Local operators also possess extensive experience in forestry practices and have modern, efficient logging and grinding equipment, ensuring sufficient capacity for harvesting and processing the rated biomass quantities.

BDO ZONE LIABILITIES

The quality and quantity of biomass derived from salvage and wildfire fuel treatment activities can fluctuate, complicating efforts to secure consistent, high-quality feedstock streams. While overall road access to Ophir is good, certain forest road networks present challenges, including tight curves and seasonal weight restrictions, which may necessitate upgrades and careful logistical planning for biomass transport.

The dependency of non-timber forestry objectives on government subsidies for long-term biomass availability from public lands introduces a medium risk, as funding is subject to political priorities and budget constraints. Finally, long-term climate trends, including recurring droughts, increased tree mortality from insect infestations, and heightened forest fire risk, pose a medium risk to sustainable biomass production and availability over typical project lifespans, although it also ensures continual wildfire mitigation activities.

INFRASTRUCTURE PROFILE

The proposed 10-acre industrial site in Ophir represents a strong infrastructure asset. It is industrially zoned, with full utility development (electric, natural gas, water, wastewater, internet), and is located less than a mile from Interstate 80, providing excellent transportation access. A unique and notable advantage for any new biomass project is the site's ownership by the Placer County Water Agency (PCWA), which is developing it as a water treatment facility and intends to utilize biomass for its energy needs. This potential for joint development offers significant economies of scale and could lead to prioritized and expedited permitting processes.

From an operational cost perspective, utility rates for electricity and natural gas are considerably higher in Placer County than national averages, influenced by regulatory fees and regional infrastructure costs. This could significantly impact the financial viability of energy-intensive operations. It is noted, however, that behind-the-meter electricity at lower cost and with higher reliability may be potentially available in the future, subject to the development of PCWA's small-scale power unit at the industrial site.

The cost of living in Placer County (and California) generally exceeds national averages, which, combined with a reported aging forestry workforce and a shortage of truck drivers, creates a medium risk for workforce recruitment and retention, potentially increasing labor costs.

The overall 'A' rating for the Placer County BDO Zone, with a score of 16.56 out of 100, reflects its strong foundation in biomass availability and strategic infrastructure, balanced against these identifiable supply chain challenges. The focus on biomass from forest restoration and fire remediation activities is important in mitigating many of the identified risks.

PROJECT TEAM

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SCORING & RATING METHODOLOGY

In assessing the biomass supply chain risk for the Biofuel 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.

- The BDO Zone is a 25-mile drive distance from the center point, which represents the siting area for future biomass projects and is where the industrial site is located.
- The Supply Zone is a 75-mile drive distance from the center point, where feedstock availability was assessed.
- The Competition Zone is a 150-mile drive from the center point, where consumers can compete for feedstock generated in the Supply Zone.

Feedstock quantities are expressed in bone dry tons per year (bdt/yr), while feedstock costs are expressed in USD ($). Maximum transport distance is based on a 75-mile driving distance from the center point (Ophir, CA).

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 (in this case a community-scale 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 Placer County, CA, is ***16.67 out of 100, resulting in an 'A' designation.***

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



SECTION A: RISK INDICATOR SUMMARY

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

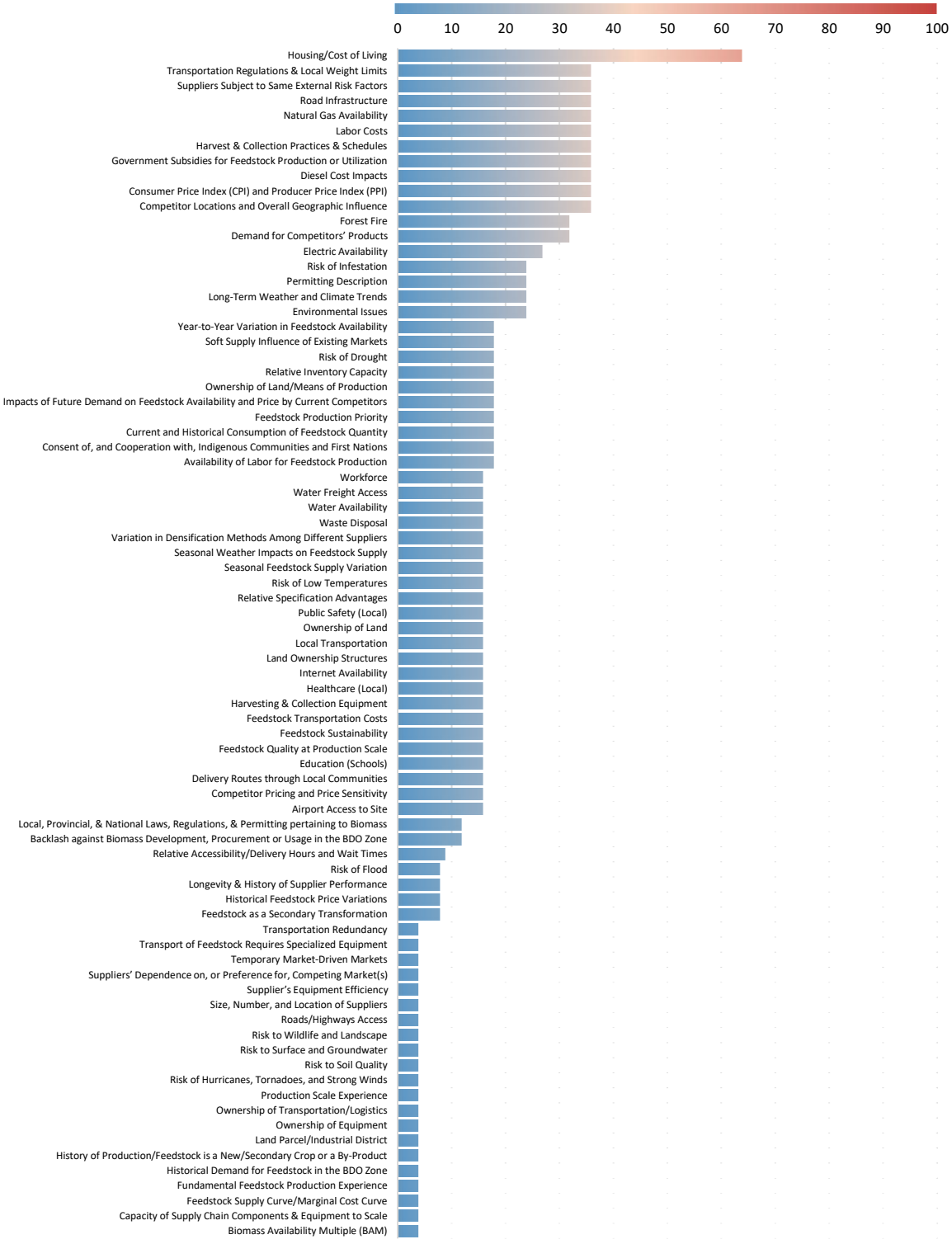


Table A-1. Risk Indicators and Associated Scores

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	50%	8
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)	2	2	4	NN	4
1.3 Risk Factor: Supplier Control Over Production and Transportation					
1.3.1 Ownership of Land/Means of Production	6	6	36	50%	18
1.3.2 Ownership of Equipment	2	2	4	NN	4
1.3.3 Ownership of Transportation/Logistics	2	2	4	NN	4
1.3.4 Feedstock as a Secondary Transformation	4	4	16	50%	8
1.4 Risk Factor: Supplier Experience					
1.4.1 Fundamental Feedstock Production Experience	2	2	4	NN	4
1.4.2 Production Scale Experience	2	2	4	NN	4
1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity					
1.5.1 Supplier's Equipment Efficiency	2	2	4	NN	4
1.6 Risk Factor: Supplier Motivation					
1.6.1 Feedstock Production Priority	4	6	24	25%	18
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	6	6	36	50%	18
2.1.3 Competitor Pricing and Price Sensitivity	4	4	16	NN	16
2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors	6	6	36	50%	18
2.1.5 Soft Supply Influence of Existing Markets	6	6	36	50%	18
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	6	6	36	50%	18
2.2.2 Relative Accessibility/Delivery Hours and Wait Times	6	6	36	75%	9
2.2.3 Relative Specification Advantages	4	4	16	NN	16
2.2.4 Demand for Competitors' Products	8	8	64	50%	32
Category 3.0: Supply Chain Risk					
3.1 Risk Factor: Feedstock Availability					
3.1.1 Biomass Availability Multiple (BAM)	2	2	4	NN	4
3.1.2 Feedstock Supply Curve/Marginal Cost Curve	2	2	4	NN	4
3.1.3 Seasonal Feedstock Supply Variation	4	4	16	NN	16
3.1.4 Year-to-Year Variation in Feedstock Availability	6	6	36	50%	18
3.2 Risk Factor: Historical Issues					
3.2.1 Historical Feedstock Price Variations	4	4	16	50%	8
3.2.2 Historical Demand for Feedstock in the BDO Zone	2	2	4	NN	4
3.2.3 History of Production/Feedstock is a New/Secondary Crop or a By-Product	2	2	4	NN	4
3.3 Risk Factor: Non-Weather Based Externalities					
3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)	6	6	36	50%	18
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	NR	NR	NR	NR	NR
3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection					
3.4.1 Harvest & Collection Practices & Schedules	6	6	36	NN	36
3.4.2 Harvesting & Collection Equipment	4	4	16	NN	16
3.4.3 Variation in Densification Methods Among Different Suppliers	4	4	16	NN	16
3.4.4 Availability of Labor for Feedstock Production	6	6	36	50%	18
3.5 Risk Factor: Transportation					
3.5.1 Feedstock Transportation Costs	4	4	16	NN	16
3.5.2 Diesel Cost Impacts	6	6	36	NN	36
3.5.3 Transport of Feedstock Requires Specialized Equipment	2	2	4	NN	4
3.5.4 Delivery Routes through Local Communities	4	4	16	NN	16
3.5.5 Transportation Regulations & Local Weight Limits	6	6	36	NN	36
3.5.6 Road Infrastructure	6	6	36	NN	36
3.5.7 Transportation Redundancy	2	2	4	NN	4

3.6 Risk Factor: Supply Chain Resiliency					
3.6.1 Size, Number, and Location of Suppliers	2	2	4	NN	4
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	8	6	48	50%	24
3.7.3 Forest Fire	8	8	64	50%	32
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	4	2	8	NN	8
3.7.7 Risk of Drought	6	6	36	50%	18
3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds	2	2	4	NN	4
3.7.9 Risk of Low Temperatures	4	4	16	NN	16
3.8 Risk Factor: Political and Social					
3.8.1 Government Subsidies for Feedstock Production or Utilization	6	6	36	NN	36
3.8.2 Local, Provincial, & National Laws, Regulations, & Permitting pertaining to Biomass	4	6	24	50%	12
3.8.3 Backlash against Biomass Development, Procurement or Usage in the BDO Zone	4	6	24	50%	12
3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations	6	6	36	50%	18
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	2	2	4	NN	4
3.9.3 Risk to Surface and Groundwater	2	2	4	NN	4
3.9.4 Risk to Hydrological Flux	NR	NR	NR	NR	NR
3.9.5 Pesticide Risk to Human and Ecosystem Health	NR	NR	NR	NR	NR
3.9.6 Risk to Wildlife and Landscape	2	2	4	NN	4
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	4	4	16	NN	16
4.1.2 Capacity of Supply Chain Components & Equipment to Scale	2	2	4	NN	4
Category 5.0: Infrastructure					
5.1 Risk Factor: Physical Infrastructure					
5.1.1 Land Parcel/Industrial District	2	2	4	NN	4
5.1.2 Ownership of Land	4	4	16	NN	16
5.1.3 Permitting Description	4	6	24	NN	24
5.1.4 Environmental Issues	4	6	24	NN	24
5.2 Risk Factor: Utilities					
5.2.1 Natural Gas Availability	6	6	36	NN	36
5.2.2 Electric Availability	6	6	36	25%	27
5.2.3 Water Availability	4	4	16	NN	16
5.2.4 Waste Disposal	4	4	16	NN	16
5.2.5 Internet Availability	4	4	16	NN	16
5.3 Risk Factor: Transportation/Logistics					
5.3.1 Roads/Highways Access	2	2	4	NN	4
5.3.2 Rail Access to Site	NR	NR	NR	NR	NR
5.3.3 Airport Access to Site	4	4	16	NN	16
5.3.4 Water Freight Access	4	4	16	NN	16
5.4 Risk Factor: Social Infrastructure					
5.4.1 Healthcare (Local)	4	4	16	NN	16
5.4.2 Education (Schools)	4	4	16	NN	16
5.4.3 Local Transportation	4	4	16	NN	16
5.4.4 Public Safety (Local)	4	4	16	NN	16
5.4.5 Housing/Cost of Living	8	8	64	NN	64
5.5 Risk Factor: Labor					
5.5.1 Workforce	4	4	16	NN	16
5.5.2 Labor Costs	6	6	36	NN	36
				Average	**16.56**

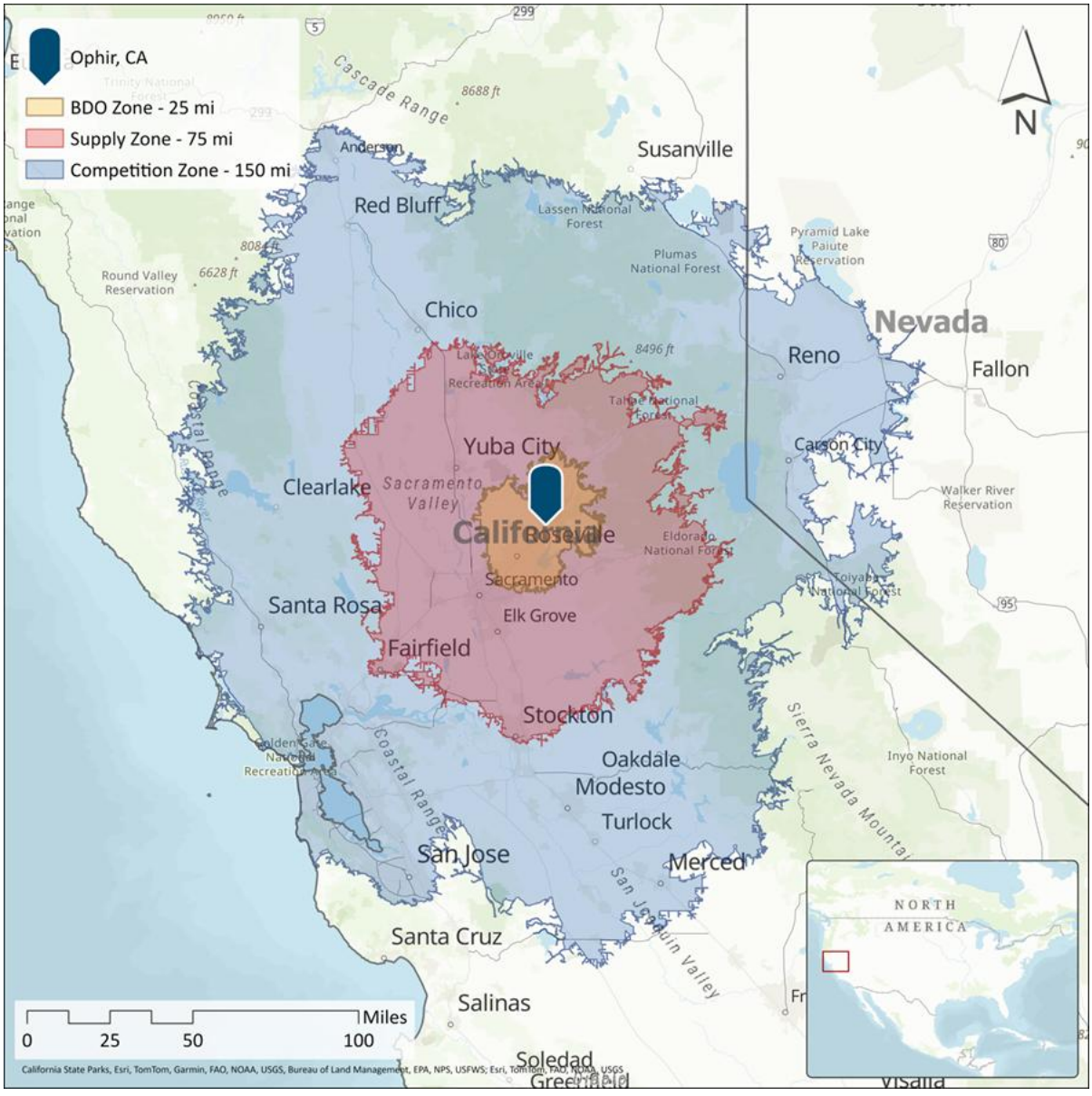
SECTION B: BIOMASS AVAILABILITY AND PRICING

OVERVIEW

This section evaluates woody biomass availability and pricing within the Supply Zone for utilization in bioenergy, biofuels, and other bio-based products. The center point for this assessment is Ophir, located in Placer County, California.

The analysis employs three geographic delineations: the BDO Zone, the Supply Zone, and the Competition Zone, as illustrated in Map B-1. The BDO Zone encompasses the area within a 25-mile driving distance from Ophir, CA, representing the potential location for new project development. The Supply Zone extends to a 75-mile radius and constitutes the biomass sourcing region. The Competition Zone extends to 150 miles, identifying areas where competing users may influence feedstock dynamics within the Supply Zone.

Map B-1. Map of BDO Zone and Competition Zone



The Supply Zone spans approximately 8,910 square miles across portions of 18 California counties, while the Competition Zone encompasses a broader area of 35,590 square miles. Softwoods constitute over 90 percent of tree species in the region, with pine and fir as dominant species. This analysis assumes competitors source biomass within a 75-mile drive distance unless otherwise noted.

EVALUATED FEEDSTOCKS[1]

The analysis focuses on two biomass resources in the Supply Zone[2]:

Pulpwood: Pulpwood consists of several sources. Pulpwood Harvest is whole trees felled during sawtimber harvesting that fail to meet sawmill specifications due to small diameter, irregular form, or other defects. Pulpwood Logs consist of the upper-stem biomass from sawtimber trees that do not meet sawmill specifications. Pulpwood Salvageable Mortality are trees killed or damaged by wildfires or disease. Pulpwood Thinnings result from wildfire fuel reduction efforts and forest remediation activities. In the Supply Zone, this material may also be referred to as non-saw, small-diameter trees, or bioenergy chips.[3]

Forest residues: Tops, branches, stumps, bark, and other woody materials generated during timber harvesting operations. These materials are typically left at landings, piled and burned, or scattered across harvest areas.

SUPPLY ANALYSIS

Pulpwood

The Supply Zone yields spruce, pine, fir sawlogs, and pulp logs, with full stem harvesting and transportation being the primary logging method in the region. Salvage of dead trees, fire remediation efforts, and forest restoration treatments are also conducted within the Supply Zone. These activities incur significantly higher costs than traditional commercial harvesting due to lower productivity and reduced accessibility. Some of these costs are offset by wildfire fuel mitigation funding, which lowers the delivered cost of biomass from fuel reduction efforts. However, a considerable amount of biomass from these treatments is either piled and burned or masticated and left on site. A new biomass project in Ophir could utilize these fuel reduction treatment materials, along with available pulp logs.

[1] Sawmill residues, including wood chips, sawdust, shavings, and bark are excluded from this rating as they are already fully committed to other industries. Also, agricultural biomass, including orchard clearings, is excluded from this assessment (refer to North San Joaquin Valley BDO Zone for an assessment of orchard clearings: https://bdozone.org/rating_award/north-san-joaquin-valley-california/).

[2] Note that both Pulpwood and Forest Residues include material that is designated as High Hazard Fuels as designated by CalFire and includes material sourced directly from forests, including whole trees removed as forest management treatments that are not otherwise used as sawtimber or veneer logs. It also includes the portions of trees not utilized by forest products manufacturers, including branches, tree tops, and the portions of a tree's main stem that are defective. California Public Utilities Commission. "Bioenergy Renewable Auction Mechanism (BioRAM)." Accessed May 20, 2025. https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/rps/rps-procurement-programs/rps-bioram.

[3] Bioenergy chips result from chipping of the various pulpwood categories. This material can be loaded onto chip vans for use at biomass energy facilities.

Figure B-1. Average Net Growth, Average Annual Removals, and GTD Ratio for All Live and Pulpwood Size Trees in the Supply Zone (2019-2021)[4]

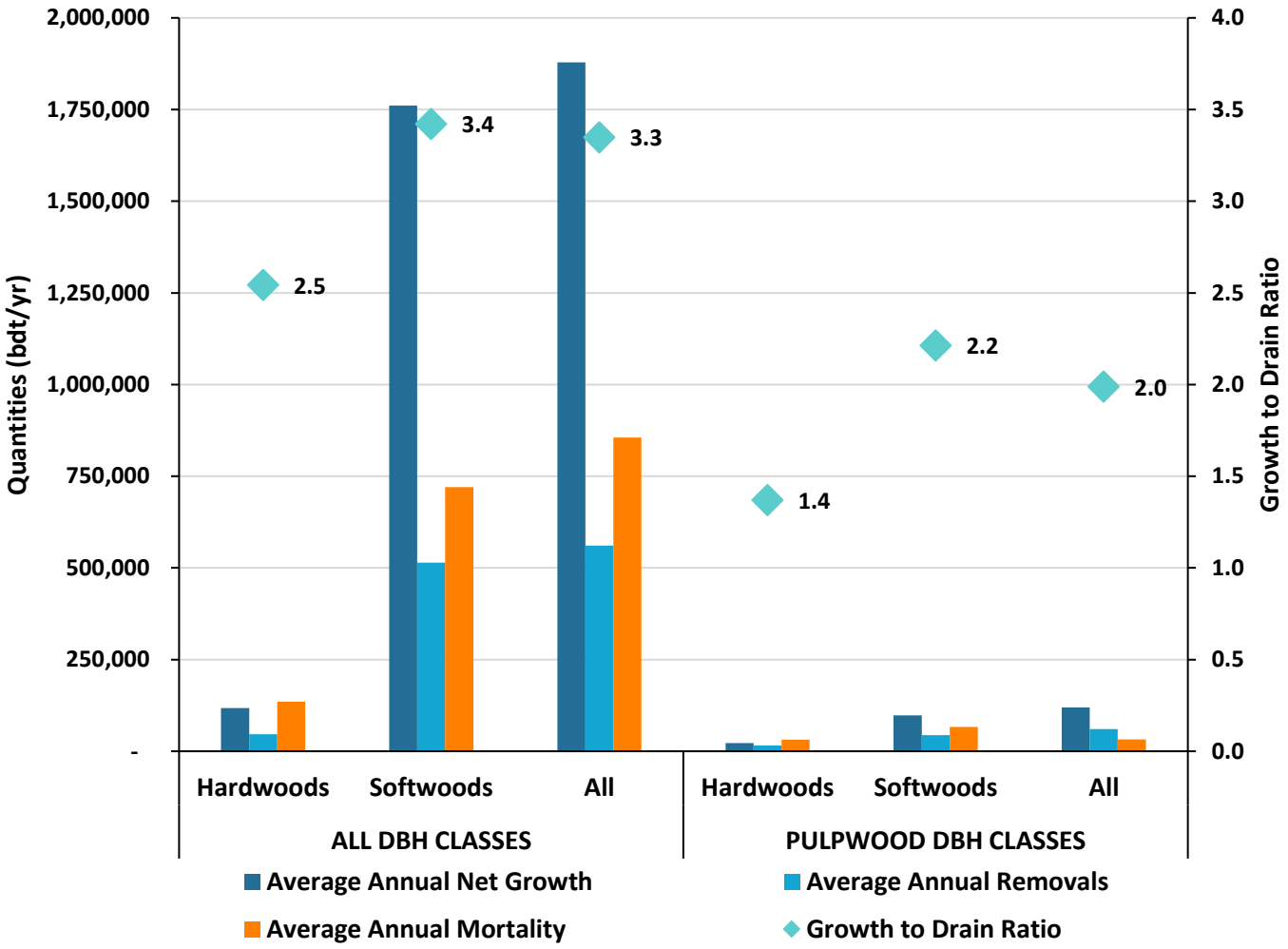


Figure B-1 presents average annual net growth, Pulpwood Salvageable Mortality, and removals per major species categories (hardwoods and softwoods) for all DBH classes (left) and Pulpwood DBH classes (right). Salvageable Mortality represents the average annual quantity of biomass from standing dead trees that could be accessed by commercial harvesting equipment.[5] Despite the declining growth, forests within the Supply Zone still exhibit an annual net growth exceeding 1.8 million bdt/yr. Of this amount, approximately 560,000 bdt are harvested annually. This results in a growth-to-drain (GTD) ratio of 3.3, which is above the benchmark value of 1.2, commonly used to indicate sustainable harvesting levels. In other words, each year there is 3.3 times as much biomass added to the Supply Zone as is taken out, providing

[4] apps.fs.usda.gov/fiadb-api/evalidator. Variables 2636: Average annual net growth of aboveground biomass of trees (at least 5 inches d.b.h./d.r.c.), in dry short tons, on timberland; 574049: Average annual removals of merchantable bole bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland; 574027: Average annual mortality of merchantable bole bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland

[5] Based on FIA mortality data filtered by slope (< 20%) and distance to road (< 1 mi).

for sustainable harvesting levels with plenty of room for additional harvests. For the Pulpwood category specifically, annual growth is estimated at 120,000 bdt, while removals total approximately 59,000 bdt per year. This yields a pulpwood GTD ratio of 2.0, indicating sustainable supply potential.

The FIA data estimated that approximately 59,000 bdt/year of Pulpwood size trees are harvested on average. Forest thinning and fuels reduction projects in Fire Hazard Severity Zones (FHSZ) represent an additional source of Pulpwood, potentially yielding approximately 43,000 bdt/yr while reducing wildfire risk. Furthermore, approximately 32,000 bdt/yr of dead pulpwood-size trees could be salvaged[6] (Figure B-1).

Additionally, FIA data indicates that approximately 24,000 bdt/yr of Pulpwood Logs[7] are generated through commercial harvesting operations in the Supply Zone. A Pulpwood Log is a log that is sorted during log processing operations as unsuitable for sawmilling or veneer production due to its size, straightness, knots, rot, or other defects. Table B-1 summarizes the total annual Pulpwood availability estimates from various sources in the Supply Zone. A total of 158,000 bdt/year of Pulpwood could be generated in the Supply Zone, assuming the 2016-21 harvest levels and salvage efforts.

Table B-1. Annual Pulpwood Availability Estimates

Source	Quantity (bdt/yr)
Pulpwood Harvest	59,000
Pulpwood Logs	24,000
Pulpwood Salvageable Mortality	32,000
Pulpwood Thinnings	43,000
Total Pulpwood Available	**158,000**

Forest residues

According to FIA data, approximately **161,000 bdt per year** of Forest Residues are generated within the Supply Zone from harvesting and salvage operations. Forest Residues consist of tops and branches remaining after log extraction. If these materials were to be harvested, they would be chipped or ground on-site and transported using chip vans.

Sawmill Residues

Within the Supply Zone, two sawmills operate with a combined annual lumber production capacity of 360 million board feet. The sawmills require an estimated 1.18 million bdt of sawlogs annually to sustain operations. Estimated volumes of sawmill residues generated within the Supply Zone are provided in Table B-2. Sawmill residues generated by the two sawmills within the Supply Zone are considered **unavailable for use by new projects**. This assessment is based on a lack of response from the sawmills regarding material availability and feedback from local experts indicating that competing operations fully utilize existing residues.

Table B-2. Sawmill Residue Production Estimates in the Supply Zone

Sawmill Residue	Chips	Sawdust	Shavings	Bark	TOTAL
Estimated Quantity (bdt/yr)	**192,000**	**39,000**	**61,000**	**56,000**	**348,000**

[6] apps.fs.usda.gov/fiadb-api/evalidator. 574027: Average annual mortality of merchantable bole bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland. Adjusted for accessibility (slope and distance to road).

[7] apps.fs.usda.gov/fiadb-api/evalidator, Variable 574054: Average annual removals of merchantable bole bark and wood biomass above the sawlog of sawtimber trees, in dry short tons, on timberland

COMPETITION ANALYSIS

There are currently 12 active competitors operating within the Competition Zone, as illustrated in Map B-2 and Table B-3. These facilities primarily utilize wood chips, sawdust, bark, or Forest Residues. The group includes one engineered wood facility, two wood pellet producers, five biomass power facilities, and four combined heat & power (CHP) facilities.

Map B-2. Biomass Competitors in the Competition Zone

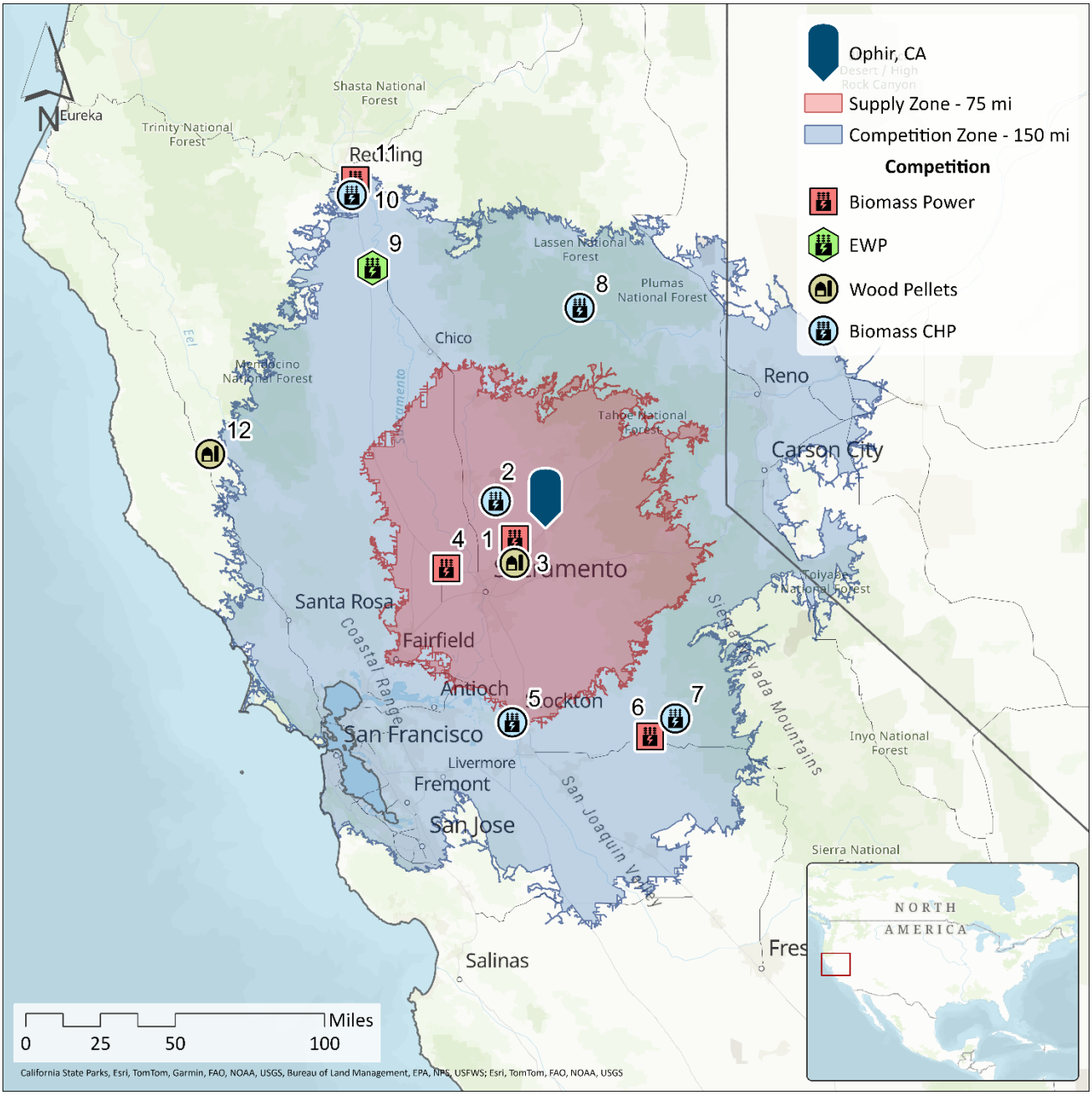


Table B-3. Current Biomass Consumers in the Competition Zone

# on Map	Name	Facility Type	Estimated Quantity Consumed at Capacity (bdt/yr)
1	DTE Stockton Biomass - Stockton, CA	Biomass CHP	360,000
2	Sierra Pacific Power Plant - Anderson, CA	Biomass CHP	270,000
3	Sierra Pacific Power Plant - Lincoln, CA	Biomass CHP	145,000
4	Sierra Pacific Power Plant - Quincy, CA	Biomass CHP	315,000
5	Sierra Pacific Power Plant - Sonora, CA	Biomass CHP	67,500
6	Pacific Ultrapower Chinese Station - Jamestown, CA	Biomass Power	144,000
7	Rio Bravo Rocklin - Lincoln, CA	Biomass Power	192,000
8	Shasta Sustained Resource Management (fmr Wheelabrator)	Biomass Power	456,000
9	Woodland Biomass Power - Woodland, CA	Biomass Power	225,000
10	Pacific Woodtech Red Bluff EWP	EWP	97,000
11	Forest Energy Mendocino	Wood Pellets	39,000
12	Mallard Creek Inc	Wood Pellets	110,000

Table B-4. Biomass Competitors Impact on The Supply Zone Wood Demand

Category	Number of Companies	Biomass Demand at Capacity (bdt/yr)	Biomass Demand on the Supply Zone (bdt/yr)	Estimated Annual Pulpwood and Forest Residue Demand Met from the Supply Zone (bdt)[8]
Engineered Wood Products	1	97,000	0	0
Wood Pellets	2	149,000	112,600	0
Biomass Combined Heat & Power	4	1,157,500	695,400	5,000
Biomass Power	5	1,017,000	108,200	90,300
Totals	**12**	**2,420,500**	**916,200**	**95,300**

The extent to which each competitor affects the wood supply available to a new project is influenced by both proximity to the Supply Zone center point and the composition of the competitor's feedstock intake. Competitors located farther from the center point have a reduced impact due to decreasing overlap with the 75-mile Supply Zone.

Wood pellet manufacturers primarily use residual wood chips from sawmills, which do not affect the availability of Pulpwood or Forest Residues. In contrast, most biomass power and combined heat and power (CHP) facilities consume Forest Residue and Pulpwood Thinnings, as well as sawmill bark and chipped orchard waste.

T**he competitive demand for Pulpwood or Forest Residue in the Supply Zone is estimated at 95,300 bdt/yr.**

[8] Demand in Supply Zone is based on the degree of overlap of each facility supply area with the Supply Zone.

Additional future competition may emerge from two announced wood pellet facilities. The Tuolumne Bioenergy Project, located near Sonora, 97 drive miles from Ophir, plans to utilize about 40,000 green tons per year of salvage wood and sawmill residuals. If completed (no commissioning date has been set), the Tuolumne facility will likely source less than 10,000 bdt/yr of feedstock from the Supply Zone. The Golden State Natural Resources Project, located near Jamestown, 95 drive miles from Ophir, was originally planned as a large-scale pellet plant, but due to community opposition, the project's original plan has been abandoned. The project may move towards wood chip production, but its future is uncertain, especially that local community backlash is expected to continue if the feedstock intake scale remains the same[9].

Table B-5 presents the total feedstock available for a new project. After adjusting for timber growth and existing competitive demand, an estimated **223,700 bdt/yr** (**146,000 bdt/yr of Pulpwood and 77,700 bdt/yr of Forest Residues**) remain available for a new project located in Ophir.

Table B-5. Woody Biomass Production, Demand, and Availability by Feedstock Type

Feedstock Type	Production (bdt/yr) Competitive	Demand (bdt/yr)	Project Availability (bdt/yr)
Pulpwood	158,000	12,000	146,000
Forest Residues	161,000	83,300	77,700
Sawmill Residues	348,000	348,000	-
Totals	**667,000**	**469,000**	**223,700**

RATED QUANTITIES AND PRICING

Table B-6 presents both technical and rated quantities of Pulpwood and Forest Residues as well as an estimated unsubsidized price range for Pulpwood and Forest Residues. A Biomass Availability Multiple (BAM) factor of 3.0 was applied to the available quantities of Pulpwood and Forest Residues to meet the overarching assumption of a small-scale community bioeconomy. The rated quantity of woody biomass, for example, will meet the demand of a carbon-negative (e.g., bioenergy unit with carbon capture) 5 MW biomass combined heat and power or a medium scale value-added (e.g., post and rail) operation. A BAM of 3.0 also accounts for uncertainty in the accuracy of existing inventory, scale-up readiness, historical harvesting practices and volumes, and sudden changes in supply and demand. However, once supply chains for the envisioned local bioeconomy were established, additional volumes will be available for expansion.

Table B-6. Rated Quantities and Delivered Price Ranges of Biomass in the Supply Zone

Feedstock Type	Available Quantity (bdt/yr)	Biomass Availability Multiple (BAM)	Rated Quantity (bdt/yr)	Delivered Price Range ($/bdt)
Pulpwood	146,000	3.0	48,700	75-95
Forest Residues	77,700	3.0	25,900	80-100
Totals	**223,700**		**74,600**	

[9] Source: https://www.nrdc.org/press-releases/californias-largest-proposed-wood-pellet-project-defeated

Table B-7 provides estimated unsubsidized delivered price ranges for Pulpwood and Forest Residues within a 75-mile haul drive distance from the center point, and an average transport distance of 50 miles. These price estimates are based on input from regional forestry professionals and cross-referenced with published sources.

Table B-7. Detailed Pricing for Delivered Feedstock

Feedstock Type	Stumpage ($/bdt)	Collection ($/bdt)	Logging ($/bdt)	Chipping ($/bdt)	Transport (bdt) (avg 50 miles)	Delivered Price Range ($/bdt)
Pulpwood Harvest[10]	0		45-60		30	75-90
Pulpwood Logs	5		45-60		30	80-95
Pulpwood Salvageable	5		45-60		30	80-95
Pulpwood Thinnings[11]	0		45-60		30	80-95
Forest Residues		15-25		35-45	30	80-100

Note that the actual market prices for feedstock are lower than the rated price range as subsidies for harvesting Pulpwood and Forest Residues are provided by grant funding,[12] state funding,[13] and USDA Forest Service contracts aimed at reducing wildfire fuel loads. As a result, these resources are not harvested based on market demand but are influenced by state policies and advocacy efforts. Recent feedstock availability studies and feedback from local experts indicate that current delivered prices can be as low as $40-$60/bdt after subsidies.

OPERATIONAL CONSIDERATIONS

Pulpwood harvesting operations within the Supply Zone generally employ crews of five to seven workers, each producing approximately 60 truckloads per week. Each truckload carries an estimated 14 bdt of logs. Transportation requirements vary based on mill proximity, with an average haul distance of 50 miles, resulting in up to four daily roundtrips. To support a biomass facility utilizing 48,700 bdt of Pulpwood annually, approximately two additional harvesting crews, totaling 12 personnel, would be required. This would also necessitate six additional log trucks and drivers. Forest Residue processing involves feeding material into a chipper that deposits chips directly into transport vans. A standard chipping crew includes two to three workers. Processing 25,900 bdt of Forest Residues annually would require two additional crews of similar size, as well as three additional trucks with chip vans and drivers.

Local sources confirmed the availability of in-woods grinding equipment. However, the accessibility of chip vans to harvesting locations is constrained by road conditions, particularly steep grades and limited turning radii on forest roads.

[10] Being a by-product, Pulpwood Harvest stumpage cost is effectively zero as it is included in sawtimber.
[11] Stumpage cost for Pulpwood Thinnings is included in the subsidy funding these operations.
[12] Sources of grant funding: Sierra Nevada Conservancy. https://sierranevada.ca.gov/grants/; CalFire Forest Health Grants. https://www.fire.ca.gov/what-we-do/grants/forest-health; CalFire Wildfire Prevention Grants. https://www.fire.ca.gov/what-we-do/grants/wildfire-prevention-grants; California Climate Investments Wildfire Prevention Grants Program. https://www.caclimateinvestments.ca.gov/fire-prevention-grants. Accessed Jan 7, 2025.
[13] Governor signs wildfire package. https://www.gov.ca.gov/2021/04/13/governor-newsom-signs-landmark-536-million-wildfire-package-accelerating-projects-to-protect-high-risk-communities/. Accessed Jan 7, 2025.

REGULATORY CONSIDERATIONS

In California, access to biomass feedstock for projects like biomass heating is regulated primarily by the California Department of Forestry and Fire Protection (CAL FIRE) under the Z'berg-Nejedly Forest Practice Act of 1973 and the associated California Forest Practice Rules. These apply to non-federal lands, including state and private timberlands in Placer County, which is part of the Sierra Nevada region with significant forested areas. Permits focus on sustainable harvesting, environmental protection, and public review, and are submitted through the online California Timber Regulation and Environmental Evaluation System (CalTREES). Multi-agency review involves entities like the California Department of Fish and Wildlife, Regional Water Quality Control Boards, and the California Geological Survey. Public lands may involve additional coordination with the U.S. Forest Service (USFS) via agreements like Master Stewardship Agreements and Good Neighbor Authority. Placer County currently holds a 10-year Master Stewardship Agreement (MSA, 2018 – 2028) with the USDA Forest Service and intends to work with the Forest Service to renew the MSA as the expiration date approaches.

Placer County itself promotes biomass access through its Wildfire Protection and Biomass Utilization Program (established 2006), which encourages removal of excess woody material to reduce wildfire risk and air pollution, often converting it to energy feedstock. However, county-level efforts defer to state permitting for actual harvesting. County-specific permits do not override state rules. Instead, the county supports projects through several planning and mitigation efforts: its strategic plan (last updated in 2014); individual and countywide Community Wildfire Protection Plans (CWPPs); the countywide Local Hazard Mitigation Plan (currently being updated in 2025); and fuel reduction programs, including the Wildfire and Forest Resilience 10-Year Action Plan, approved by the Board of Supervisors in July 2024. Additional efforts are carried out by key partners, such as the local CAL FIRE unit, Resource Conservation Districts, fire departments and fire protection districts, community services districts, water agencies, and others.

In Placer County, traditional biomass is often sourced from private timberlands (one-third owned by companies, two-thirds by families/individuals/tribes), with CAL FIRE oversight.

Wildfire Fuel Reduction Biomass

This involves thinning, brush removal, and salvage from high-hazard zones to mitigate fire risk. Regulations prioritize expedited access to encourage removal over on-site burning or mastication. Much of this occurs on public lands under fuel reduction goals, with biomass extracted for utilization.

- **Key Permits and Exemptions** (to avoid full Timber Harvesting Plan (THP) process):
    - **Forest Resilience Exemption (formerly Forest Fire Prevention Exemption)**: Allows up to 300 acres for fuel breaks and thinning in high-hazard areas; no THP needed if conditions met (e.g., no watercourse impacts).
    - **Dead, Dying, or Diseased Exemption**: For removing infested or fire-damaged trees; unlimited acreage if documented.
    - **Fuel Hazard Reduction Emergency Notice**: For immediate post-fire or preemptive thinning; valid for 1 year, extendable.
    - **Less Than 3-Acre Conversion Exemption**: For small-scale clearing, with waivers for repeated use under certain conditions.
    - **Structure Protection Fire Safe Exemption**: For 150-300 feet around structures.

These exemptions require notices filed with CAL FIRE, often with minimal review (e.g., 5-10 days). In Placer County, fuel reduction is supported by 35 state-identified priority projects (part of CAL FIRE's 45-Day Report), and the county's program

integrates with USFS for federal lands. Biomass from these activities can be accessed via contracts with LTOs, funded partly by state grants (e.g., up to $2,500/acre for contractors).

If removal involves burning residues, separate burn permits from the Placer County Air Pollution Control District are needed on permissive burn days.

Recent Changes (2023-2025)

Regulations have evolved to accelerate fuel reduction amid increasing wildfires, with updates emphasizing exemptions for faster access. No major overhauls to traditional THP processes, but refinements to exemptions:

- **AB 2276 (Effective January 2024)**: Repealed the Small Timberland Owner Exemption; renamed the Forest Fire Prevention Exemption to Forest Resilience Exemption; extended fuel reduction exemptions (e.g., Forest Resilience, Oak Woodland) until January 1, 2031.
- **AB 1526 (2023)**: Authorized waivers for one-time use of <3-acre conversion exemptions, with Board of Forestry regulations implemented in 2025.
- **Emergency Forest Resilience and Oak Woodland Exemption Amendments (Effective January 2025)**: Updated rules for exemptions, incorporating AB 2276 changes to enhance resilience-focused activities.
- **Forest Practice Rules 2025 Edition**: Incorporates all above, with forms revised July 2024 (e.g., for exemptions).
- **Wildfire and Forest Resilience Action Plan Updates**: CAL FIRE expanded fuels reduction to 100,000 acres annually by 2025, indirectly easing access via more funded projects.

No Placer County-specific changes were noted; county programs align with state updates. These shifts generally facilitate easier access to fuel reduction biomass, with minimal impact on traditional forestry permits.

SECTION C: INFRASTRUCTURE



PROPERTY OVERVIEW

Address:	10505 Ophir Rd
City:	Newcastle
State:	California
County:	Placer
Acres:	10 Acres
Pricing Note:	Yes
Topography:	Graded/loose dirt
Zoning:	M-Industrial
Building on Site:	Yes

SITE CONTACTS

Economic Development Contact
Tony Firenzi
Director of Strategic Affairs
Placer County Water Agency
53-832-4965
tfirenzi@pcwa.net

ADDITIONAL NON-RATED SITES

Infrastructure Site Contact
Tom Johnson
Placer County Water Agency
916-764-2268
tjohnson@trjllc.com

PROPERTY PROFILE

The 10-acre industrial site in Ophir, California features full utility development including electric, gas, and water service. Located less than one mile from Interstate 80, the property is owned by Placer County Water Agency and currently functions as a storage yard leased to a private company. The site contains several cleared lots with existing road access. Site preparation would require minimal tree trimming and grading. The property's industrial zoning designation permits commercial development. Transportation access includes proximity to Union Pacific Railroad (4 miles) and Auburn Municipal Airport (6 miles). Refer to Section E for map information.

Transportation/Logistics

Nearest Highway: Ophir Road
Nearest Interstate: I-80 (< 1 mile)
Nearest Airport: Sacramento International (35 miles)
Rail Served: UPRR and Amtrak (6 miles)
Rail Accessible: Transmodal to Auburn
Rail Infrastructure in Place: Not at site

Electric Service

Supplier: Pacific Gas & Electric
Ownership: Investor-Owned
Phone: 877-660-6789
Website: https://www.pge.com/
All Utilities Extend to Site: Yes
Nearest Substation: Adjacent
Capability: Service is available up to 15kV at the site
Note: Behind-the-meter electricity at lower cost and with higher reliability potentially available in the future, subject to the development of PCWA's small-scale power unit at the industrial site.

Natural Gas

Supplier: Pacific Gas & Electric
Ownership: Investor-Owned
Phone: 877-660-6789
Website: https://www.pge.com/
Size of Pipe: 6" available
Pressure: 50 psi
Capability: Easily expandable for larger industrial volumes.

Water

Supplier: Placer County Water Authority
Ownership: Municipal
Phone: 530-823-4850
Website: www.pcwa.net
Size of Main: 12"
Peak Capacity: 1.000.000 gals/day
Capability: Piping for industrial volumes

Wastewater

Supplier: County of Placer
Ownership: Municipal
Phone: 530-889-6846
Website: www.placer.ca.gov
Size of Main: 6-12"
Capability: 1,000,000 gals/day

Telecommunications

Supplier: Frontier Internet
Ownership: Private
Phone: 877-720-1153
Website: https://internet.frontier.com/
Platforms: Fiber, wireless
Capability: Primary wireless and fiber optics available.

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: Commercial logging operations in the Supply Zone began in the mid-1800s to support the gold rush and the expanding railroad industry. Over the past decade, two sawmills in the Zone, owned by Sierra-Pacific Industries, have operated consistently, producing approximately 360 million board feet of lumber. Sierra-Pacific Industries, founded in 1949, is the second-largest lumber producer in the United States. The extensive operational history and stability of key suppliers yield low risk related to supplier solvency, demonstrating commercial resilience through multiple economic cycles.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* This risk is mitigated by the overarching assumption that supply for the local bioeconomy will consist of biomass (Pulpwood and Forest Residues) generated by fire remediation and forest restoration activities. Recent national and state legislative measures provide strong incentives to access these types of feedstocks, thus, mitigating/reducing the risk associated with a downturn in sawmilling activities in the region. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100.	**Score** **8**

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: There is no evidence that suppliers have vested interest or preference in supplying the rated woody biomass to competitors.

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

Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

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: In the Supply Zone, 59% of timberland is owned by the National Forest and other public entities, while 41% is privately owned. Public ownership introduces additional complexity through regulatory requirements, permitting processes, and funding constraints that can affect harvest timing and volume. New projects face medium risk regarding feedstock security due to this ownership structure, as they must navigate both public land management policies and private landowner priorities to secure a consistent supply.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* This risk is mitigated by the rated quantities of Pulpwood and Forest Residue which can be readily available from both public and private forestlands. Moreover, as mentioned above, recent national and state legislative measures incentivize biomass harvesting in National and State forests, thus further reducing this risk. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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.

Risk Information: Loggers operate as independent contractors, with most owning their own equipment. For jobs requiring additional short-term equipment, they subcontract to other logging companies. Logging and chipping equipment is standardized across the region and readily available, supported by the increase in fuel reduction and

salvage work following recent wildfires. This ownership model carries very low risk as it provides operational flexibility and resilience in the supply chain. Equipment ownership by suppliers enhances their ability to respond to market opportunities and maintain reliable operations without dependence on third-party availability.
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**

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: Loggers typically own their own trucks. For larger contracts requiring additional trucking capacity, they hire extra truck drivers or contract with independent truck owner-operators as needed. This self-sufficiency in transportation reduces supply chain vulnerabilities and contributes to low risk in this area. The availability of supplier-owned transportation assets enhances suppliers' ability to control delivery schedules and costs, resulting in more reliable feedstock delivery for potential projects. The established practice of supplementing owned assets with contracted services during peak demand provides additional flexibility to the system.
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**

1.3.4 Feedstock as a Secondary Transformation

Rationale: Secondary transformation is dependent upon the production of primary products. Forest Residue and Pulpwood (with the exception of Pulpwood Salvageable Mortality and Pulpwood Thinning) 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 Forest Residue and Pulpwood Logs 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 Forest Residue and Pulpwood Logs.

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

Risk Information: The Forest Residue portion of the rating, which makes up 35% of total rated quantity, is considered a secondary transformation. Due to the fact that only two sawmills exist in the Supply Zone, both owned by the same company (Sierra-Pacific Industries), RI 1.3.4 for Forest Residue is rated as medium risk. On the other hand, the high BAM applied to Pulpwood, representing 65% of rated feedstock quantity, renders the risk associated with RI 1.3.4 as low ions. On balance, therefore, the risk is deemed very 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) This risk is mitigated by the overarching assumption that supply for the local bioeconomy will consist of biomass (Pulpwood and Forest Residues) generated by fire remediation and forest restoration activities. State legislative measures provide strong incentives to access these types of feedstocks, thus, mitigating/reducing the risk associated with a downturn in sawmilling activities in the region. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100.	**8**

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: The risk evaluation indicates low concern, given the extensive expertise in feedstock production throughout the Supply Zone. Logging operators, forest management professionals, and processing facilities show significant collective experience with the specified feedstock types. This robust knowledge base includes harvesting

techniques, quality control measures, and processing requirements specific to regional biomass resources. The deep industry experience substantially reduces the chance of supply disruptions due to operational inexperience, with minimal impact anticipated on feedstock quality or availability.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

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: Logging companies in the Supply Zone demonstrate capability to supply the rated quantities of Pulpwood and Forest Residue to a project located in Ophir. The risk is 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

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: The Supply Zone has a long-standing history in logging and trucking. Suppliers in this region have significant expertise in biomass harvesting, handling, and transportation. Common activities include log harvesting and thinning operations that involve in-woods chipping. Equipment efficiency is generally aligned with industry standards, creating low risk in this category. Suppliers utilize modern forestry equipment appropriate for the terrain and forest types 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

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. When biomass feedstock is a by-product of another main higher margin or main product such as Forest Residue and Pulpwood Logs, supply may not be a top priority for a supplier.

Risk Information: Forest Residue, Pulpwood Logs, and Pulpwood Harvest are dependent on sawlog production, while Pulpwood Salvageable Mortality and Pulpwood Thinnings are not. As such, 69% of potentially available woody biomass is dependent on the sawmilling industry, and 31% is not. Due to the fact that there are only two sawmills in the Supply Zone, and other sawmills located in close proximity are owned by the same company (Sierra-Pacific), the risk associated with the 69% of rated woody biomass is considered medium. Risk regarding the remaining 31% of material is considered low, given the push towards wildfire prevention, although it is difficult to say with certainty whether the current approach to biomass removal will remain over a hypothetical 20-year life of a project.

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) Notching is applied due to the high BAM, which allows for skewing the woody biomass mix towards Pulpwood Salvageable Mortality and Pulpwood Thinnings (i.e. wildfire risk reduction material).	**25%**

RRI Mitigation (Notch) No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 25%.
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100. **18**

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: Twelve competitors for Forest Residues, Pulpwood and, potentially, material derived from wildfire prevention efforts, operate within the Competition Zone (Map B-2 and Table B-4, Section B), of which four are located in a cluster close to Ophir. This geographical proximity creates medium likelihood of supply constraints with corresponding medium impact on feedstock availability and pricing. The risk also applied to Pulpwood Thinnings and Pulpwood Salvageable Mortality as these competitors may eventually increase the quantities of wildfire prevention materials, depending on pricing and quality.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

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 presented in Section B (Figure B-2), the anticipated consumption levels pose medium risk to feedstock availability for new projects, as existing and new facilities may secure supply agreements before a new entrant in Ophir will be able to establish a strong market position.

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 *RRL Mitigation (Notch)* This risk is mitigated by the assumption that a new community-sized project will focus its procurement around biomass acquired from forest fuel reduction operations. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**18**

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: The absence of pulp and paper mills within the Competition Zone results in minimal demand for Pulpwood and limited competitive pressure on pricing. Delivered prices for Pulpwood reflect combined costs of $45–$60/bdt for stumpage and logging, plus approximately $30/bdt for a 50-mile average haul. For Forest Residues, haul costs are similar, but processing costs rise to $50–$70/bdt due to higher labor and fuel inputs. These costs would render feedstock economically unviable at market rates, however, current delivered prices are substantially offset by state and federal subsidies resulting in a current delivered cost of $40-$60/bdt. Users of this material are dependent on these subsidized price structures, as unsubsidized costs would exceed what end users can afford. Despite this reliance, competitive risk from other buyers remains low, and the likelihood of price escalation due to market competition is limited.

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) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

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: No announcements of capacity expansion by current competitors in the Supply Zone were identified. However, this does not mean that such expansions will not take place eventually, especially given the county, state, and federal incentives and mandates regarding forest fuel reduction goals. In terms of proposed projects, due to distance, the two announced facilities will have a minor impact on the Supply Zone. Finally, there is uncertainty related to potential future competition that has not been announced or identified but is in early developmental stages.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* This risk is mitigated by the assumption that a new community-sized project will focus its procurement around biomass acquired from forest fuel reduction operations. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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: Long-term ties exist between suppliers and biomass consumers, especially those in close proximity. These established relationships often go beyond formal agreements, encompassing operational familiarity, dependable payments, and a shared understanding of quality standards. In times of supply shortages, suppliers tend to prioritize these long-standing customers, which may restrict availability for new market entrants. This dynamic poses a medium risk to supply security for new projects, as they must navigate the advantages held by established market players to build reliable supply chains.

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) This risk is mitigated by the assumption that a new community-sized project will focus its procurement around biomass acquired from forest fuel reduction operations. From this perspective, the existing long-term relationships are less important as the suppliers are more incented to keep all markets for removed fuels fed. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**18**

2.1.6 Temporary Market-Driven Markets

Rationale: Alternative, non-traditional, market-driven competitors for feedstock can drive feedstock demand in unusual circumstances.

Risk Information: No temporary markets for woody biomass were identified in the Supply Zone. The absence of temporary markets significantly reduces the risk of temporary supply shortages and price increases. This stability in market applications provides greater certainty for project developers regarding consistent resource availability regardless of external market conditions.

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/Notchings	**Notch**

RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **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: There is uncertainty related to establishing the amount of inventory stored by existing competitors. This uncertainty stems from a limited market response. A few data points collected to answer this question suggest inventory capacities ranging between two weeks and two months. The sheer number of industrial-scale competitors for woody biomass, including nine biomass power and CHP plants, increases the risk that competitors' relative inventory capacity is high.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* This risk is mitigated by the assumption that a new community-sized project will focus its procurement around biomass acquired from forest fuel reduction operations. The price of forest fuel reduction material is currently not driven by fluctuating demand, so competitors' inventory capacity's importance to general risk profile is less important. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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: The general market perception is that wait times for biomass deliveries to competitors are approximately 20–30 minutes, though uncertainty surrounds the actual average wait times experienced by suppliers. This 20–30 minute duration is viewed as relatively brief, and for most suppliers, it raises the operational expectations for new projects. The associated risk is considered 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) This risk is mitigated by the assumption that a new community-sized project will focus its procurement around biomass acquired from forest fuel reduction operations. A community-sized project is unlikely to experience long wait times. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 75%.	**75%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 9 out of 100.	**9**

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: Although there is uncertainty regarding exact feedstock specs current competitors accept, the general market knowledge is that the competitors in the region require and maintain high-quality standards for supplied feedstocks. These established specifications create market clarity regarding acceptable material characteristics, contamination limits, and processing requirements. A new project can effectively adopt these existing standards without facing competitive disadvantages from specification differences. This standardization shows a low risk (but not very low due to the uncertainty) regarding quality specification competition, with minimal impact anticipated on feedstock procurement for new entrants in the BDO Zone.

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) No adjustment. *RRI Mitigation (Notch)*	**NN**

No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **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: Most competitors in the woody biomass sector focus on generating power or combined heat and power, increasing the risk of limited availability and higher prices for woody biomass due to anticipated rises in demand for biomass power. State-level policies, driven by the need to manage increasing volumes of forest biomass from fuel reduction treatments, have led to new regulations requiring utilities to boost biomass power procurement. These include SB 1109 (2022), which extended and broadened mandates for electric utilities to source energy from biomass facilities, especially those using forest waste from high-hazard fire zones. In July 2025, the California Public Utilities Commission (CPUC) passed Resolution E-5288 to enforce this, requiring investor-owned utilities (IOUs) to extend existing Bioenergy Renewable Auction Mechanism (BioRAM) contracts or secure new ones. BioRAM mandates utilities to purchase power from biomass plants fueled by wildfire-related waste. Additionally, AB 706 (2025), which is still pending as of August 2025, is expected to further increase demand for biomass power. The Joint State-Federal Biomass Utilization Strategy, released in April 2025 by CAL FIRE, the California Energy Commission (CEC), and the U.S. Forest Service, is also likely to heighten demand for biomass power.

For wood pellets and fuel wood chips used in industrial and residential heating, global demand is growing, leading to increased production. This rising demand impacts feedstock needs for these facilities, potentially limiting availability for new market entrants.

Given the projected increase in demand for competitors' products, this risk indicator is considered high.

Raw Risk Likelihood (RRL) The risk likelihood is deemed high, therefore the RRL is 8 out of 10.	**Score** **8**
Raw Risk Impact (RRI) The risk impact is deemed high, therefore the RRI is 8 out of 10.	**Score** **8**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 64 out of 100.	**Score** **64**
Mitigation/Notching *RRL Mitigation (Notch)* The risk is mitigated by the assumption that a new project entrant will be a community-scale facility utilizing wildfire fuel treatment material. As such, the new entrant would significantly benefit from the same policies driving the demand for biomass power. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score	**Score**

The Loaded RI Score ((1-Total Notch) X GRI Score) is 32 out of 100.	**32**

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: A Biomass Availability Multiple (BAM) factor of 3.0 was applied to the quantities of Pulpwood and Forest Residues available, aligning with the core assumption of a small-scale community bioeconomy. This BAM factor of 3.0 accounts for uncertainties related to the precision of current inventory data, readiness for scaling operations, historical harvesting patterns and volumes, and abrupt shifts in supply and demand. Once the supply chains for the planned local bioeconomy are established, additional volumes will become accessible for expansion. This conservative multiplier ensures sufficient supply redundancy for new initiatives within the BDO Zone. The approach suggests a very low risk concerning feedstock volume projections, with negligible effects expected on the actual supply security for new projects.

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

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: To assess the availability of Pulpwood and Forest Residue by delivered price and distance to Ophir, detailed supply/marginal cost curves were developed (Figure E-6). The analysis shows that the designated quantities of Pulpwood and Forest Residues can be sourced from relatively short distances, within a 50-mile drive. The curves also reveal that the specified price ranges could unlock substantial additional volumes during supply disruptions, offering valuable redundancy. This supply distribution suggests a very low risk concerning feedstock accessibility within cost-effective transport distances, with negligible impact expected on supply security during standard operations.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.1.3 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,[14] which can manifest in shortages and higher costs for Issuers.

Risk Information: Logging and fuel reduction activities at higher elevations face seasonal limitations due to snowfall, impacting biomass availability during the winter months (December to February). This seasonal variation creates challenges for ensuring a steady supply year-round. However, the assessment highlights that lower elevation areas remain accessible during winter, offering alternative harvesting zones during these seasonal constraints. This geographical diversity indicates a low risk of seasonal supply disruptions, as logging contractors can adapt to these seasonal challenges.

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**

[14] Golecha & Gan, 2016.

Mitigation/Notching	Notch
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.1.4 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.

Risk Information: The volatility in annual harvesting levels introduces considerable uncertainty for long-term feedstock planning and price stability for projects in the BDO Zone. Additionally, year-to-year variation in feedstock availability can be affected by wildfire outbreaks. Between 2016 and 2021, approximately 34% of the timberland in the Supply Zone, equivalent to about 217,000 acres, sustained fire damage. This significant level of disturbance creates medium risk for consistent supply reliability. Fire events can simultaneously impact large areas, creating both short-term access challenges and longer-term changes in resource quality and composition. While salvage operations can temporarily increase available material after fire events, the unpredictability of timing and location creates planning challenges for consistent operations.

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) The risk is mitigated by the assumption that a new project entrant will be a community-scale facility utilizing wildfire fuel treatment material. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	50%
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	18

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.

Risk Information: Historical market prices for the US Northwest Region from 2014 to 2025, as reported by Forisk (Figure E-9), show variable prices for Pulpwood and Forest Residues, particularly over the last five years (note that more precise, localized data was unavailable, so regional pricing serves as a proxy for general trends). This price volatility could create planning difficulties for projects relying on consistent feedstock costs. The observed price fluctuations suggest a low-to-

medium risk concerning cost predictability, impacting financial modeling and contract structures for new projects in the BDO Zone.

Conversely, the price of wildfire fuel treatment material is anticipated to remain stable, as it is influenced by operational costs and available funding mechanisms rather than supply and demand dynamics.

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) The risk is mitigated by the assumption that a new project entrant will be a community-scale facility utilizing wildfire fuel treatment material. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100.	**8**

3.2.2 Historical Demand for Feedstock in the BDO Zone

Rationale: If a 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 Residues, where, typically, the infrastructure for collection, processing, and delivery is immature.

Risk Information: Significant long-term expertise is available for supplying the specified quantities of Pulpwood and Forest Residues within the BDO Zone. This well-established demand history reflects mature supply chains with a demonstrated ability to provide consistent biomass volumes for comparable applications. Additionally, many biomass power and CHP plants have been serving as markets for wildfire fuel treatment material. The existence of historical demand patterns lowers uncertainty about supplier capabilities and market development needs. This market maturity suggests a very low risk concerning supply chain preparedness, with negligible impact expected on ramp-up timelines for new projects in the BDO Zone, given the specified quantity.

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**

3.2.3 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.
Risk Information: None of the rated feedstocks represents new material for regional suppliers. Risk is 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**

3.3 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: Significant but temporary increases in CPI[15] and PPI[16], as seen between 2020 and 2022, notably affected biomass delivery prices due to pandemic-related disruptions and global supply chain issues. Although economic indicators point to gradual stabilization, the recent volatility highlights susceptibility to macroeconomic pressures. While the CPI and PPI fluctuations of 2020–2022 are viewed as an anomaly within the broader trend, they underscore the sensitivity of biomass supply chains to such economic indicators, which influence various cost components, including labor, fuel, equipment, and maintenance expenses. As a result, the risk associated with CPI and PPI fluctuations is considered medium.

[15] U.S. Bureau of Labor Statistics. "Consumer Price Index, West Region – Summary." Accessed January 8, 2025. https://www.bls.gov/regions/west/cpi-summary/ro9xg01a.htm.

[16] U.S. Bureau of Labor Statistics. "Final Demand: 12-Month Percent Change." Accessed January 8, 2025. https://www.bls.gov/charts/producer-price-index/final-demand-12-month-percent-change.htm.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* The risk is mitigated by the assumption that a new project entrant will be a community-scale facility utilizing wildfire fuel treatment material. Although the costs associated with conducting operations in fuel treatment are subjected to CPI and PPI, they are mitigated by the wildfire fuel treatment funding mechanisms and general regulatory environment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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 to this BDO Zone as all transactions would occur within the United States using a single currency.

Raw Risk Likelihood (RRL) The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**Score** **NR**
Raw Risk Impact (RRI) The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**Score** **NR**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is not rated.	**Score** **NR**
Mitigation/Notching The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**Notch** **NR**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**Score** **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 to this BDO Zone as all operations would occur domestically without cross-border movement of materials.

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**

3.3.4 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.[17]

Risk Information: Not relevant to this BDO Zone as woody biomass lacks alternative use cases that would create temporary market competition during external disruptions.

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**

3.4 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 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: The amounts and characteristics of Pulpwood and Forest Residue derived from salvage and wildfire fuel treatment reduction efforts exhibit variability that may hinder the production of high-quality biomass products. This diversity is amplified when feedstocks come from different altitudes and forest types, creating obstacles for maintaining consistent quality and efficient supply planning. Differences in harvesting methods, processing techniques, and seasonal timing contribute to inconsistencies in moisture levels, contamination, and fiber attributes. These operational variations generate a medium risk related to feedstock quality consistency, impacting processing requirements and conversion

[17] Bergtold, 2018.

efficiency. Project proponents often overlook this variability, which could result in substantial cost increases for establishing stringent feedstock quality control and logistics systems.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.4.2 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.

Risk Information: Forest operations within the Supply Zone utilize modern mechanized forestry equipment, such as harvesters, skidders, processors, and loaders, complemented by high-productivity grinding equipment available throughout the region. This modern equipment inventory enables efficient harvesting, collection, and processing operations that meet the quality standards required for potential projects. The availability of suitable technology and machinery suggests a low probability of equipment-related quality issues. However, some risk persists due to the characteristics of material from wildfire fuel treatment processes, which is generally more contaminated than biomass derived from traditional roundwood.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.4.3 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.

Risk Information: Forest biomass harvested in the Supply Zone is produced in formats acceptable to all wood processing companies in the region. No alternative densification methods beyond standard chipping/grinding are currently required or demanded in the BDO Zone. This standardization in processing methods contributes to consistency in material handling characteristics and physical properties. The established processing approach presents low risk regarding format compatibility, however, some risk remains with regards to the wildfire fuel treatment processes (which can slightly differ in the equipment used from the traditional forestry operations) and resulting feedstock.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.4.4 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: The forestry and logging workforce within the Supply Zone exhibits an aging demographic trend with minimal recruitment of younger workers into the industry. A regional shortage of truck drivers has also been reported. Although long-term labor availability poses potential challenges, immediate workforce constraints are unlikely. This labor market condition suggests a medium risk to long-term supply capability, with minimal impact expected on the initial operations of new projects in the BDO Zone.

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 *RRL Mitigation (Notch)* Several funding programs aim at improving the availability of workforce in the forest sector, including CAL FIRE Wood Products and Bioenergy Business and Workforce Development Grants, California Conservation Corps (CCC) Forestry Corps Grant Program, California Resilient Careers in Forestry (by U.S. Economic Development Administration). These, and potentially other, funding programs aim at mitigating the risk associated with forestry workforce attrition. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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 50 miles on average, and up to 75 miles, 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: Transportation costs account for approximately 20 to 50 percent of the total delivered biomass price. These costs vary depending on biomass type, haul distance, and regional supply-demand conditions. Supply curve analysis (Figure E-6) indicates that rated feedstock volumes can be sourced within up to 50 miles. These transportation economics fall within standard industry parameters for similar operations and the risk was assessed as low.

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

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: Figure E-8 illustrates the fluctuation of diesel prices over the past decade, ranging from a low of $2.34 in January 2016 to a high of $6.87 in May 2022. Prices have shown some stabilization since the the COVID-19 pandemic. This variability yields medium risk for transportation cost stability. Fuel constitutes a significant portion of delivered feedstock costs, making projects vulnerable to price spikes. The historical pattern demonstrates the potential for rapid price escalation during supply disruptions, requiring robust financial planning and contingency reserves. Strategic inventory management and flexible supply zones can partially mitigate these impacts.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.5.3 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: As presented in Section B - Operational Considerations, six logging trucks, and three additional trucks with chip van trailers would be necessary to transport the rated quantities of Pulpwood and Forest Residues. Research suggests that equipment in these quantities can be easily found in the Supply Zone, and therefore the risk is deemed 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.5.4 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: To deliver the rated quantity of Pulpwood and Forest Residue, it is estimated that 15 trucks per day would need deliver feedstock (74,600 bdt/yr / 365 days / 14 bdt/truckload). This results in about one delivery per hour. Such delivery frequency in and around Ophir, especially given local support for forest biomass utilization, is associated with low risk of community backlash due to increased traffic.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.5.5 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: Road weight restrictions are in place across the region, especially in mountainous areas during wet and snowy seasons. Many forest roads are not designed to accommodate heavy truck traffic, potentially necessitating upgrades to support higher biomass transport volumes. These regulatory and infrastructural limitations may restrict access during certain times or require route adjustments that elevate transportation costs. Such transport constraints pose a medium risk to logistics planning, impacting delivery reliability and transportation economics for new projects in the BDO Zone.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**Score** **36**

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: Access to timberlands is generally sufficient for fuel reduction activities. However, approximately 40% of these roads have tight curve radii, restricting the type and size of trailers that can navigate them. While the removal of logs is not significantly impacted, the use of longer trailers or vans commonly used for transporting biomass chips is limited. These infrastructure constraints introduce medium risk for efficient material transportation. Road improvements would be required to optimize transportation efficiency in some areas, potentially increasing development costs. The seasonal condition of many forest roads further complicates year-round access, particularly during wet periods when weight restrictions may be implemented to prevent road damage.

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

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: As detailed in Section B – Operational Considerations, supplying the rated quantities will require six logging trucks and three trucks with chip vans. Research confirmed sufficient logging trucks and chip vans exist to support transportation of rated quantities of Pulpwood and Forest Residues. The risk is deemed very low.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**Score** **2**
Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.6 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 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: Risks associated with size, number, and location of suppliers in the context of the rated quantity, and the assumption that a new project will focus feedstock procurement around wildfire fuel reduction treatment biomass, is considered very low. There are numerous logging operations, many of which are currently engaged in fuel reduction treatments.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

3.6.2 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: Several common risk factors could simultaneously affect multiple suppliers in the region, including constrained sawlog availability, fluctuating housing starts and lumber prices, and inconsistent funding for salvage and forest restoration activities in public forests. These systemic risks have historically impacted the regional forest industry and are likely to continue presenting challenges. The exposure of the supplier base to these shared external factors results in a medium risk to supply chain resilience, as disruptions tend to impact multiple suppliers concurrently rather than individually. This systemic vulnerability reduces the effectiveness of supplier diversification as a risk mitigation approach.

It is noted that the likelihood of funding for wildfire fuel reduction disappearing in the short-term is low. However, given the 20-year perspective of this risk rating, the long-term uncertainty surrounding government funding contributes to classifying this risk 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.6.3 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. Typically (but not always), state or federally owned forests have a higher risk profile from the biomass supply security perspective than private forests as they are subjected to changing government policies and environmental group pressures.

Risk Information: Of the private timberland, one-third is owned by timber companies, while two-thirds is held by families, individuals, and tribes. Public lands are subject to fuel reduction objectives and are undergoing biomass extraction. However, some long-term risk persists due to uncertainties in funding availability over the long term. As a result, the risk associated with land ownership structures is considered 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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 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: Seasonal variation has little impact on feedstock harvesting. While snow can restrict operations in higher elevations and wet weather may limit harvesting on poorly drained sites, these challenges are mitigated by focusing on accessible areas. This operational flexibility contributes to low risk for seasonal weather impacts. The diverse topography within the Supply Zone enables shifting operations between areas based on seasonal conditions, maintaining consistent production throughout the year. Standard inventory management practices can effectively buffer the minor seasonal variations that do occur. The primary seasonal constraint relates to road conditions during wet periods, which may temporarily restrict access to some harvest areas.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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: The region experiences droughts and temperature shifts that are altering tree growth rates and mortality patterns, affecting long-term biomass availability. Increased tree mortality from insects, disease, and drought stress leads to the accumulation of dead trees as fire hazards. Post-wildfire landscapes exhibit greater vulnerability to landslides and erosion, making some burned areas unsafe for biomass removal. Additionally, heavy rainfall events are becoming more frequent, increasing the likelihood of road washouts and access limitations.[18] These long-term climate trends present high risk to sustainable biomass production and availability over typical project lifespans, with medium impact on long-term supply security mitigated by wildfire fuel mitigation efforts.

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) The overarching assumption of a community bioeconomy located in Placer County has the potential to reduce this risk by making available feedstocks from forest restoration and fire remediation activities planned to mitigate these climate issues. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**24**

3.7.3 Forest Fire

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

Risk Information: According to CAL FIRE, the Supply Zone is at high risk for wildfires.[19] The Fire Hazard Severity Zones within the Supply Zone, where biomass is sourced, are classified as moderate, high, or very high. This elevated fire risk creates high risk for resource stability. Fires can simultaneously affect large areas, creating both immediate access challenges and longer-term changes in resource quality and composition. While salvage operations can temporarily increase available material after fire events, the unpredictability of timing and location creates planning challenges for consistent operations. The projected increase in fire frequency and severity due to climate change may further elevate this risk over time.

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 high, therefore the RRI is 8 out of 10.	**8**
Gross Risk Indicator (GRI)	**Score**

[18] Sierra Business Council, The Forest Management Opportunity Final Report (2022)
[19] "Fire Hazard Severity Zones." Accessed January 8, 2025. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones.

The Gross Risk Indicator (RRL X RRI) is 64 out of 100.	**64**
Mitigation/Notching *RRL Mitigation (Notch)* The overarching assumption of a community bioeconomy located in Ophir has the potential to reduce this risk by making available feedstocks from forest restoration and fire remediation activities planned to mitigate these climate issues. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 32 out of 100.	**Score** **32**

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 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: The threat of bark and wood-boring beetles to California forests has increased in recent years, driven by prolonged drought and wildfires. These insects target weakened trees, causing significant damage or death. Such infestations can adversely affect the rated quantity of biomass. This emerging threat constitutes medium to high risk for forest health and subsequent biomass availability. Insect outbreaks can rapidly affect large areas, altering both the quantity and quality of available material. While infested material remains utilizable for bioenergy applications in the short term, widespread mortality can disrupt sustainable harvest planning and create challenges for long-term resource management.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed high, therefore the RRI is 8 out of 10.	**Score** **8**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**Score** **24**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**Score** **24**

3.7.5 Risk of Hail

Rationale: Hail has negligible impact on forestry biomass. However, 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 to this BDO Zone.

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**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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 not rated.	**NR**

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: The center point of the BDO Zone is situated in an area of minimal flood risk. Overall, the Supply Zone is classified as a low-risk area for flooding.[20] The topography of the region generally provides good drainage, minimizing vulnerability to flood events. While localized flooding may occasionally affect specific road segments during extreme precipitation events, these impacts are typically short-term and affect limited areas. Standard operational planning can effectively mitigate these minor flood-related disruptions through route diversification and inventory management. Although the likelihood of road washouts is there, the impact to biomass supply chains is very 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 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) No adjustment. *RRI Mitigation (Notch)*	**NN**

[20] Federal Emergency Management Agency. "Federal Emergency Management Agency." Accessed January 7, 2025. https://www.fema.gov/.

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 8 out of 100. **8**

3.7.7 Risk of Drought

Rationale: Droughts can cause significant disruptions to feedstock supplies across entire BDO Zones for extended periods of time. 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: The Supply Zone frequently experiences drought conditions, with abnormally dry periods occurring in seven of the past ten years.[21] These conditions increase the likelihood of infestations and wildfire outbreaks. The recurring drought pattern creates medium risk for forest health and operational stability. Extended drought periods stress forest ecosystems, increasing vulnerability to insect attacks and disease, while simultaneously elevating fire danger. These cascading effects can significantly impact both resource availability and access conditions. Climate projections indicating increasing drought frequency and severity suggest this risk may intensify over time, potentially affecting long-term resource sustainability.
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)* **50%** The overarching assumption of a community bioeconomy located in Ophir has the potential to reduce this risk by making available feedstocks from forest restoration and fire remediation activities planned to mitigate this issue. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100. **18**

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

[21] National Integrated Drought Information System. "Drought Conditions for Placer County." Accessed January 7, 2025. https://www.drought.gov/states/california/county/placer.

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: The Supply Zone has a Minimal Wind Factor, indicating a very low likelihood of being affected by hurricanes, tornadoes, or severe storm winds.[22] This favorable wind hazard profile contributes to very low risk for wind-related disruptions. While occasional winter storms may produce damaging winds, these events are typically localized and infrequent. The minimal wind hazard simplifies operational planning compared to regions with significant wind risk

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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: Winter temperatures in the region often drop below 40 degrees Fahrenheit, occasionally causing short operational delays due to equipment maintenance requirements. However, local suppliers have substantial expertise in handling cold weather conditions and have adopted effective mitigation strategies, including modified maintenance schedules, cold-weather lubricants, and tailored operational protocols. The manageable and predictable nature of these cold weather effects suggests a low risk to the overall biomass supply, though it may affect seasonal harvesting schedules and equipment efficiency during winter months in higher elevation areas.

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) No adjustment. *RRI Mitigation (Notch)*	**NN**

[22] Risk Factor. https://riskfactor.com/ Accessed Jan 7, 2025.

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**

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: Non-timber forestry objectives, including wildfire mitigation, watershed protection, and ecological restoration depend on government subsidies. USFS funds available for forest management programs exhibit significant interannual volatility.[23] In addition BioRAM funding provides subsidies to existing biomass plants, introducing investment risk for biomass supply chains.[24] This situation is further complicated by existing biomass power plants under BioRAM contracts (e.g., Rio Bravo Rocklin, SPI Lincoln) that already absorb substantial available feedstock, leaving low margins for new projects.[25] However, the above are not direct feedstock subsidies. The rated price ranges in Table B-5 reflect unsubsidized prices which guarantee the availability of rated quantities of Pulpwood and Forest Residues to a project in Ophir. Consequently, although no direct subsidies exist, the analysis indicates a medium risk for this indicator, due to dependency on federal appropriations, which remain subject to political priorities and budget constraints for long-term biomass availability from public lands.

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)* **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 36 out of 100. **36**

[23] nationalaglawcenter.org/wp-content/uploads/assets/crs/R43872.pdf
[24] Forest Management Opportunity Report, 2022
[25] TCSI Capacity Report, 2024

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.

Risk Information: As outlined in Section B – Regulatory considerations, access to biomass requires permits, but is generally eased through various exemptions (mainly around fuel reduction programs) and initiatives. The general direction in changing regulatory landscape and permitting at local, state, and federal levels, is positive with regards to access to biomass, and especially fuel reduction material. Some risk remains due to the number of regulations, compared to other BDO Zones where very little or no regulations exist.

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) The risk is mitigated through an assumption that a new entrant will utilize mainly wildfire fuel reduction material, which is strongly supported by the current regulatory environment, and will likely remain so in the future. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 12 out of 100.	**12**

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: In Placer County, the prevalent public opinion on biomass removal from forests—encompassing both traditional forestry byproducts (Forest Residue, Pulpwood) and wildfire fuels from treatment programs (Pulpwood Thinning and Salvage)—leans towards support, particularly when framed as a tool for wildfire risk reduction and forest health improvement. County-led initiatives, such as the Wildfire Protection and Biomass Utilization Program established in 2006, reflect community backing for utilizing excess woody biomass to protect residents, property, and landscapes from catastrophic fires. Recent projects, like the Cabin Creek Biomass facility approved in 2024, have advanced with local government endorsement, indicating broad acceptance among stakeholders focused on air quality, watershed protection, and economic benefits from converting waste into energy. However, pockets of opposition exist, primarily from environmental groups concerned that biomass extraction could harm biodiversity, soil health, and carbon storage, viewing it as a "false solution" that exacerbates forest degradation rather than truly mitigating fires. Overall, support appears dominant in local policy and community wildfire plans, driven by the region's vulnerability to fires.

Public opinion has shifted towards greater support for biomass removal following significant wildfires in the Sierra Nevada, such as the Camp Fire (2018), Dixie Fire (2021), and Caldor Fire (2021), which impacted nearby areas and

heightened awareness of fuel overload from decades of fire suppression. These events underscored the risks of unmanaged forests, leading to increased acceptance of thinning and biomass utilization as resilience strategies. For instance, post-fire studies and initiatives, like California's Wildfire and Forest Resilience Action Plan, have promoted fuel treatments, with public sentiment favoring actions that reduce high-severity fire risks and smoke exposure. In Placer County, this is evident in accelerated projects like the Tahoe-Central Sierra Initiative and North Lake Tahoe Biomass Task Force, where community involvement has grown, viewing biomass removal as preferable to uncontrolled burns. Opposition persists among some environmentalists, who argue that post-fire logging can hinder natural recovery and biodiversity, but overall, the shift post-2018 fires has been towards pragmatism, with economic valuations showing benefits like $3,000/ha in water and hydropower savings from treatments.

Generally, we deem the likelihood of social backlash as low, with potential medium impacts, given history of project opposition in Sierra Nevada.

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) The risk is mitigated through an assumption that a new entrant will utilize mainly wildfire fuel reduction material, which is generally supported by the public and stakeholders, and will likely remain so in the future. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**50%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 12 out of 100.	**12**

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: California's AB 52[26] requires public agencies to consult with Native American tribes that are traditionally and culturally affiliated with a project's geographic area during the California Environmental Quality Act (CEQA) process. This consultation is mandatory if a tribe requests notification and consultation regarding potential impacts to tribal cultural resources within its traditional territory. The requirement is triggered only when the tribe actively initiates the request. This regulatory framework creates medium risk for project development timelines and permitting processes. While explicit consent is not always mandated, tribal opposition can significantly delay or modify projects. Effective engagement with tribal communities during early planning stages is essential for addressing concerns and ensuring project success.

[26] CA Governor's Office of Land Use and Climate Innovation. "Tribal Cultural Resources (AB 52)." Accessed January 21, 2025. https://lci.ca.gov/ceqa/tribal/.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* The risk is mitigated through an assumption that a new entrant will utilize mainly wildfire fuel reduction material, which is generally supported by the public and stakeholders, including indigenous tribes, and will likely remain so in the future. The Total Notch (RRL Notch) X (RRI Notch) is 50%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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: Food security is not relevant to this Supply Zone as none of the biomass sources are food crops and do not cause land-use changes. Unlike agricultural-based biomass systems that may compete with food production, forest-based biomass utilization avoids these concerns.

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

Risk Information: In California, current law requires that trees harvested for commercial purposes must have a Timber Harvest Plan (THP) prepared by a Registered Professional Forester.[27] This plan is reviewed and approved by state agencies and serves as the functional equivalent of an Environmental Impact Report, addressing various aspects of forest health, including soil, water, fire, wildlife, fish, Native American impacts, forestry practices, and public resources.

The largest private landowner in the region, Sierra Pacific Industries, has its timberlands certified for sustainability under the Sustainable Forestry Initiative (SFI)[28] and encourages other private landowners to participate in this program.[29] Public timberlands, however, are not sustainability certified. Instead, harvests on public lands must undergo an approval process under the National Environmental Policy Act (NEPA) administered by the U.S. Environmental Protection Agency.[30]

This robust regulatory framework contributes to low risk for sustainability concerns. The established certification systems and regulatory processes provide verification of sustainable management practices, enhancing project credibility with stakeholders and regulators

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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.

[27] Timber Harvest Plans in California. www.wildcalifornia.org/_files/ugd/64096f_b2aa0aa2387547ce9bfee9b032282b5a.pdf?index=true. Accessed Dec 22, 2023.
[28] Sierra Pacific Industries. Personal Communication.
[29] Sierra Pacific Industries. Sustainability. https://www.spi-ind.com/OurForests/SustainableForestInitiative. Accessed Jan 8, 2025.
[30] National Environmental Policy Act. https://www.epa.gov/nepa. Accessed Jan 8, 2025.

Risk Information: Sustainability of soil quality is addressed through loggers complying with SFI standards and requirements set by NEPA. These frameworks include specific provisions for soil protection during harvesting operations, including restrictions on ground-based equipment during wet conditions, requirements for water bars on skid trails, and limitations on ground disturbance in sensitive areas. This comprehensive approach to soil management results in low risk for soil degradation impacts. The established best management practices effectively mitigate potential soil impacts from biomass recovery operations. Compliance with these standards is monitored through the permitting process and certification audits, providing verification of implementation.

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 16 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.9.3 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 sustainability of both surface and groundwater quality is supported by logging operations that adhere to NEPA requirements and SFI standards. These frameworks include specific provisions for water resource protection, including streamside management zones, road construction standards to minimize erosion, and restrictions on equipment operation near water bodies. This comprehensive approach to water resource management results in low risk for water quality impacts. The established best management practices effectively mitigate potential water quality impacts from biomass recovery operations. Compliance with these standards is monitored through the permitting process and certification audits, providing verification of implementation.

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) No adjustment. *RRI Mitigation (Notch)*	**NN**

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

3.9.4 Risk to Hydrological Flux

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: Not Rated.

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

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: Not Rated.

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

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: Biomass production and supply chain operations impart a very low risk to wildlife and landscape as they are carried out in compliance with NEPA regulations and SFI standards. These frameworks include specific provisions for wildlife habitat protection, including retention of snags and down wood, maintenance of diverse stand structures, and special management zones around sensitive habitats. The regulatory requirements for Timber Harvest

Plans specifically address wildlife impacts through biological assessments and mitigation measures. This comprehensive approach to wildlife conservation results in low risk for wildlife impacts. The established best management practices effectively balance biomass recovery with habitat conservation needs, minimizing potential conflicts with wildlife conservation objectives. This assessment if further supported by the fact that wildfire fuel treatments directly benefit wildlife through wildfire mitigation.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.9.7 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 to this BDO Zone as the biomass sources are naturally occurring forest species without genetic modification. The absence of GMO concerns simplifies regulatory compliance and public acceptance compared to some agricultural biomass systems that may utilize genetically modified crops.

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: The Supply Zone has a long-established and efficient system for producing, harvesting, transporting, and processing sawmill residues, as well as chipping Pulpwood and Forest Residues. The quality of these materials is sufficient for most biobased projects and has been utilized by biomass power facilities in the Competition Zone for many years. This established production history contributes to low risk for quality consistency during scale-up. The standardized processing methods produce predictable material characteristics that have been validated through commercial operations. Quality parameters are well-understood and can be reliably specified in supply agreements, minimizing uncertainty for conversion technology performance.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

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 described in Section B – Operational Considerations, the rated quantities could be produced and delivered with current harvesting, collection, pre-processing, and transportation capacities. Risk is deemed very low for the rated quantities.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

CATEGORY 5.0: INFRASTRUCTURE RISKS

Note: Unless infrastructure risks deviate from expected norms, whether positively or negatively, the risk score is 16 by default, equivalent to an 'A' rating.

5.1 Risk Factor: Physical Infrastructure

5.1.1 Land Parcel/Industrial District

Risk Information: The 10-acre site in Ophir, CA, is zoned for commercial and industrial use and is currently utilized as a storage yard for trucks and construction equipment. The site is equipped with basic utilities, including natural gas, electricity, and water. The site includes several cleared lots with road access. Minor tree trimming and grading around the perimeter would allow full use of the site.

Newcastle, one mile from the site, and Auburn, four miles away, provide access to the infrastructure and community amenities needed to support industrial operations. The existing zoning and infrastructure minimize permitting and development timelines compared to undeveloped sites. The moderate site preparation needs can be addressed through standard construction activities without specialized requirements or environmental remediation.

The site is being developed as a water treatment facility by Placer County Water Agency which offers the biomass user the ability to jointly develop the site with PCWA which could provide significant economies of scale. PCWA desires to utilize biomass to power its water treatment process. This deems this risk indicator very low risk.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

5.1.2 Ownership of Land

Risk Information: The Ophir Road site is publicly owned by the Placer County Water Agency. Ownership by local government contributes to low risk for property acquisition processes. Standard due diligence would be required for transaction completion, but significant title complications appear unlikely based on current information.

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) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.1.3 Permitting Description

Risk Information: Development of a community-scale biomass project in Placer County is subject to federal, state, and local regulations governing environmental impact, air quality, land use, and safety. Key agencies include the California Department of Forestry and Fire Protection (CAL FIRE), the Placer County Air Pollution Control District (PCAPCD), the California Energy Commission (CEC), and Placer County's Community Development Services. The Cabin Creek Biomass Energy Facility near Truckee provides a relevant example of the permitting process, which includes Environmental Impact Assessment (CEQA), air quality permits (Placer County Air Pollution Control District), Land Use Zoning Permits (Placer County Planning Services), waste management and water permits, safety and labor compliance, construction permits.

California's regulatory framework, including Placer County's, remains more stringent than many U.S. jurisdictions due to its robust environmental laws and air quality standards. For this reason this risk indicator is deemed medium. The score is lowered by the fact that the site is being developed as a water treatment facility by Placer County Water Agency, and therefore any permitting requirements are expected to be prioritized and expedited.

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

5.1.4 Environmental Issues

Risk Information: The rural location of the center point, combined with its proximity to forested areas and water sources, presents several environmental risks that could influence operational costs and regulatory compliance.

The site is situated near dense vegetation, which increases vulnerability to wildfires, particularly during California's dry season. The frequency and intensity of wildfires have risen in recent years, posing risks of operational disruptions and property damage. To mitigate wildfire risks, California utility companies implement Public Safety Power Shutoffs (PSPS) during high fire-risk periods.

Placer County is in a seismically active region, though not directly on major fault lines. Industrial facilities must adhere to stringent earthquake-resilient building codes. These environmental conditions create medium risk for operational continuity and compliance costs. The wildfire vulnerability requires robust contingency planning and potentially increased insurance costs. The seismic design requirements may increase construction costs compared to regions with lower seismic activity. These factors should be incorporated into project financial planning and risk management strategies.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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: Pacific Gas & Electric (PG&E) supplies natural gas in northern California. In July 2024, the average industrial natural gas rate was $9.87 per MCF,[31] ranking as the fourth highest in the United States. Commercial natural gas rates in Placer County are elevated due to regulatory fees, infrastructure safety upgrades, and California's renewable energy initiatives. Seasonal demand and the state's reliance on imported natural gas also contribute to price increases during peak periods.

The industrial site is serviced by a six-inch distribution line operating at 60 psi. The high cost of natural gas in the region represents a notable risk factor for new industries considering this location. This combination of adequate infrastructure but elevated costs creates medium risk for utility economics. While physical supply constraints are unlikely, the high

[31] Choose Energy. "Natural Gas Rates by State." Last modified October 2024. https://www.chooseenergy.com/data-center/natural-gas-rates-by-state/.

cost structure may significantly impact operational economics for natural gas-intensive processes. Future rate increases should be anticipated in financial modeling, potentially affecting long-term competitiveness
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)* **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 36 out of 100. **36**

5.2.2 Electric Availability

Risk Information: The Ophir Road site benefits from on-site distribution power lines and high-voltage transmission lines (25kV) along its southern boundary. Electricity in the area is supplied by Pacific Gas & Electric (PG&E). At 38 cents per kWh, these rates are almost double the national average of 20 cents per kWh.[32] These elevated costs are partly attributed to maintenance expenses associated with operating in a challenging region. PG&E has maintained a stable reliability rating across central and northern California, ensuring consistent service despite the high-risk wildfire zones it serves. However, wildfire-related power shutoffs during peak fire seasons pose an intermittent risk to uninterrupted operations. This combination of adequate infrastructure but elevated costs creates medium risk for utility economics. While physical supply constraints are unlikely, the high cost structure may significantly impact operational economics for electricity-intensive processes. Reliability concerns during fire season require contingency planning for critical systems.
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)* **25%** No adjustment. *RRI Mitigation (Notch)* The risk is mitigated by PCWA's plan to construct a facility at the industrial site which will provide behind-the-meter electricity at discounted price. The Ophir facility will provide behind-the-meter electricity, giving PCWA energy independence, cost protection, and resilience against PG&E's Public Safety Power Shutoffs (PSPS). With PG&E interconnection approval, the facility may also export electricity to the grid. PCWA's Ophir

[32] EnergySage. Accessed September 8, 2025. https://www.energysage.com/local-data/electricity-cost/ca/placer-county/auburn/.

waterworks will be an energy-intensive system, requiring significant electricity to pump and treat water. To meet this demand, PCWA plans to partner with a technology provider to develop a biomass-to-energy facility that will reduce excess forest biomass residues while generating reliable, stand-alone power. The Total Notch (RRL Notch) X (RRI Notch) is 25%.
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 27 out of 100. **27**

5.2.3 Water Availability

Risk Information: Water service to the site is managed by Placer County Water Association (PCWA), with supply sourced through canals operated by Pacific Gas & Electric Company (PG&E). Annually, after the irrigation season in October or November, PG&E performs maintenance on these canals, temporarily interrupting water deliveries to PCWA customers. To mitigate the impact, PCWA coordinates scheduled canal outages with PG&E's maintenance activities and redistributes available water supplies among its users. While this approach ensures general water availability, it could present challenges for industries requiring continuous water access. The Ophir Road site has existing water service; however, upgrades to the piping infrastructure would be necessary to accommodate water-intensive operations. This scenario creates low risk for water availability but may require planning for scheduled maintenance periods. The predictable nature of the maintenance outages allows for operational planning to accommodate these temporary interruptions. Water storage systems could provide continuity during these brief service interruptions if required for critical processes.

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**

5.2.4 Waste Disposal

Risk Information: Placer County provides sewer and wastewater services in Newcastle, including removal and treatment. While the Ophir Road industrial site has wastewater infrastructure, upgrades may be required depending on proposed effluent discharge. Solid waste disposal is available at Recology Placer Auburn's public landfill, located six miles north of the site. This facility accepts various waste types, including organic and food waste, provided they comply with California regulations. Hazardous materials are not accepted, in line with state prohibitions. The landfill's proximity offers convenient waste management options for potential industries. This established waste management infrastructure creates medium risk for waste handling costs and compliance requirements. While basic services are available, industrial users may face significant upgrade costs for wastewater systems to meet discharge requirements.

Special waste streams would require dedicated management plans and potential off-site disposal arrangements, adding operational complexity and cost.

From the community-scale biomass project perspective, the above shortcomings do not render waste disposal as a high-risk indictor, and the score is deemed 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 *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.2.5 Internet Availability

Risk Information: Ophir is serviced by major internet providers, including AT&T and Xfinity with speeds up to 5G available for commercial and industrial users. Smaller providers also operate in the area. This telecommunications infrastructure creates low risk for digital connectivity needs. The presence of multiple service providers offers redundancy options and competitive pricing. The available bandwidth is sufficient for standard business operations, though very data-intensive applications might require service upgrades or dedicated infrastructure. Overall, the telecommunications infrastructure provides adequate support for modern industrial operations with standard connectivity requirements.

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

5.3 Risk Factor: Transportation/Logistics

5.3.1 Road/Highway Access

Risk Information: The site is less than a mile from Interstate 80. Ophir Road is paved and designed to accommodate commercial traffic. This transportation access contributes to very low risk for logistical operations. The proximity to a major interstate highway provides efficient routes to regional markets and supply sources. The existing road infrastructure is designed for commercial vehicles, minimizing concerns about weight restrictions or access limitations. This favorable location minimizes transportation costs and enhances supply chain reliability compared to more remote sites with limited access options.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

5.3.2 Rail Access

Risk Information: The site does not include direct rail access. However, Union Pacific Railroad (UPRR) freight terminals and an Amtrak station are located within a few miles; a siding is located one mile away. Intermodal carriers operating in the Auburn area provide services connecting the site to UPRR terminals. This arrangement creates low risk for rail transportation needs that are not site-dependent. The additional handling and transportation between the site and rail terminals would add cost and complexity compared to rail-served sites, but would not preclude utilizing rail transportation for appropriate shipments.

In the context of a community-scale biomass project, which would likely not need access to rail for product export, this risk indicator is deemed irrelevant.

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**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)*	**NN**

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 not rated. — **NR**

5.3.3 Airport Access

Risk Information: Auburn Municipal Airport, located seven miles from the industrial site, provides general aviation, business jets, and emergency air services. Sacramento International Airport, 33 miles away, offers passenger and freight services through 13 major air carriers and seven freight companies. This air service profile creates very low risk for business travel and air freight needs. The local airport provides convenient access for business aircraft and emergency services, while the reasonable driving distance to a major commercial airport enables efficient personnel travel and air freight options. The available air services are adequate to support standard business operations without significant logistical constraints.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

5.3.4 Water Freight Access

Risk Information: The Port of Sacramento, located 37 miles from the center point, offers water freight access to the Pacific Ocean via the Sacramento River. The Sacramento River and its deepwater channel remain navigable year-round, ensuring reliable freight operations regardless of seasonal conditions. This water freight option creates low risk for bulk shipping needs. While not immediately adjacent to the site, the reasonable driving distance to the port provides viable options for bulk material shipments or oversized equipment deliveries that benefit from water transportation. The year-round navigability enhances reliability compared to seasonal water routes in other regions. Standard trucking connections between the site and port would be required for any water-based shipments.

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

5.4 Risk Factor: Social Infrastructure

5.4.1 Healthcare (Local)

Risk Information: Ophir, as a small community lacks dedicated healthcare facilities like hospitals or major medical centers within its boundaries. Instead, residents rely on nearby infrastructure in Auburn (about 3-5 miles east) and larger regional hubs like Roseville (about 15-20 miles southwest):

- Sutter Auburn Faith Hospital: The closest full-service hospital to Ophir, about 3-5 miles away (5-10 minute drive). This 64-bed facility offers emergency services, surgery, maternity care, and general acute care. It's a Level IV trauma center and part of the Sutter Health network.
- Sutter Roseville Medical Center: About 15-20 miles from Ophir (20-30 minute drive). A larger 328-bed hospital with advanced services, including a Level II trauma center, cardiology, oncology, and orthopedics. It serves as a regional hub for Placer County.
- Kaiser Permanente Roseville Medical Center: Also about 15-20 miles away. This 340-bed hospital provides comprehensive care for Kaiser members, including emergency, pediatrics, and specialty services like neurology and cancer treatment.

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

5.4.2 Education (Schools)

Risk Information: The Auburn Union School District serves 1,550 students in grades one through eight and provides bus services for Auburn and Newcastle families. Auburn Union High School and Placer School for Adults (PSA) offer vocational, technical trades, and agricultural programs. Within 100 miles of Auburn, 54 colleges enroll over 433,000 students. The nearest, Sierra College in Rocklin, located just over 10 miles away, provides two-year programs, transfer pathways to four-year universities, and vocational training relevant to regional industries. This educational

infrastructure contributes to very low risk for workforce development needs. The comprehensive K-12 system supports workforce family needs, while the vocational programs and higher education options provide pathways for workforce training and professional development. This educational ecosystem enhances the region's ability to develop and maintain skilled labor pools relevant to industrial operations.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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.	**16**

5.4.3 Local Transportation

Risk Information: Placer County Transit offers bus service between Auburn and Sacramento, with connections to light rail. The system is rated 4 out of 5 and features affordable fares at $1.25 each way, including discounts for regular commuters.[33] This public transportation option creates very low risk for workforce commuting needs. The established transit system provides viable alternatives to personal vehicle transportation for commuting workers, enhancing workforce access and potentially reducing transportation costs. The connections to regional transportation networks further expand accessibility to the broader labor market, though rural areas may have limited service options.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

[33] Placer County Transit. "Home." Accessed December 3, 2024. https://placercountytransit.com/.

5.4.4 Public Safety (Local)

Risk Information: Specific crime data for Ophir is not available, therefore data for Auburn is used as a proxy. In 2024, 382 violent crimes per 100,000 people took place in Auburn, compared to 431 US Average. The difference between property crimes in Auburn compared to the rest of the US is even greater: the rate is 661 per 100,000 people in Auburn, while the national average is 2,146[34]. Therefore, risk related to public safety is deemed 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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

5.4.5 Housing/Cost of Living

Risk Information: The cost-of-living index for Ophir and its surrounding area is 138.7% of the national average, primarily influenced by elevated housing costs.[35] The median home price in Auburn is $575,000, or $327 per square foot, approximately 97% above the national average. Rent prices are also high, with average apartment rents around $1,847. Additional factors such as groceries, transportation, and healthcare contribute to the overall higher living expenses. This elevated cost structure creates high risk for workforce affordability challenges. The high housing costs may necessitate premium wage scales to attract and retain workers, particularly for specialized positions. Workforce recruitment from outside the region may face resistance due to housing affordability concerns, potentially limiting the available labor pool for new operations.

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 high, therefore the RRI is 8 out of 10.	**8**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 64 out of 100.	**64**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**

[34] Source: https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/downloads
[35] Flyhomes. "Cost of Living in Auburn, CA." Accessed December 3, 2024. https://flyhomes.com/cost-of-living/auburn--ca.

Loaded RI Score	Score
The Loaded RI Score ((1-Total Notch) X GRI Score) is 64 out of 100.	64

5.5 Risk Factor: Labor

5.5.1 Workforce

Risk Information: As of 2024, Placer County's unemployment rate stands at approximately 4.2%,[36] slightly below the national average, reflecting a stable economy and a competitive labor market for local recruitment. The workforce is skilled, with strengths in healthcare, education, retail, and technical services. Proximity to Sacramento and population growth contribute to an expanding talent pool. While the low unemployment rate indicates some competition for labor, Placer County's highly educated workforce offers valuable opportunities for industries requiring skilled and adaptable employees. This labor market profile creates low risk for workforce availability. The diversified skill base and educational attainment levels support various industrial operational needs, though specialized positions may face more competitive recruitment challenges. The growing population base provides potential for workforce expansion as new operations develop and mature.

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) No adjustment. *RRI Mitigation (Notch)* No adjustment. 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

5.5.2 Labor Costs

Risk Information: In Placer County, labor costs are moderately high compared to many regions in the United States. The minimum wage is $16 per hour, higher than both the federal minimum of $7.25 and California's statewide minimum of $15.50 (as of 2024). The average annual salary in the county is approximately $44,897, or $22 per hour.[37] This elevated cost structure creates medium risk for operational economics. The higher wage requirements increase operational costs compared to regions with lower labor cost structures, potentially affecting competitive positioning for labor-intensive operations. However, the skilled workforce may provide productivity advantages that partially offset the higher cost basis. Automation strategies may be particularly beneficial for optimizing labor utilization in this higher-cost environment

Raw Risk Likelihood (RRL)	Score

[36] YCharts. "Placer County, CA Unemployment Rate." Accessed December 3, 2024. https://ycharts.com/indicators/placer_county_ca_unemployment_rate.

[37] Employment Development Department. "Labor Market Information Division - Home Page." Accessed December 3, 2024. https://labormarketinfo.edd.ca.gov/.

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

SECTION E: TABLES AND FIGURES

Figure E-1. Merchantable Biomass of All Live Trees in the Supply Zone (2016-2021)[38]

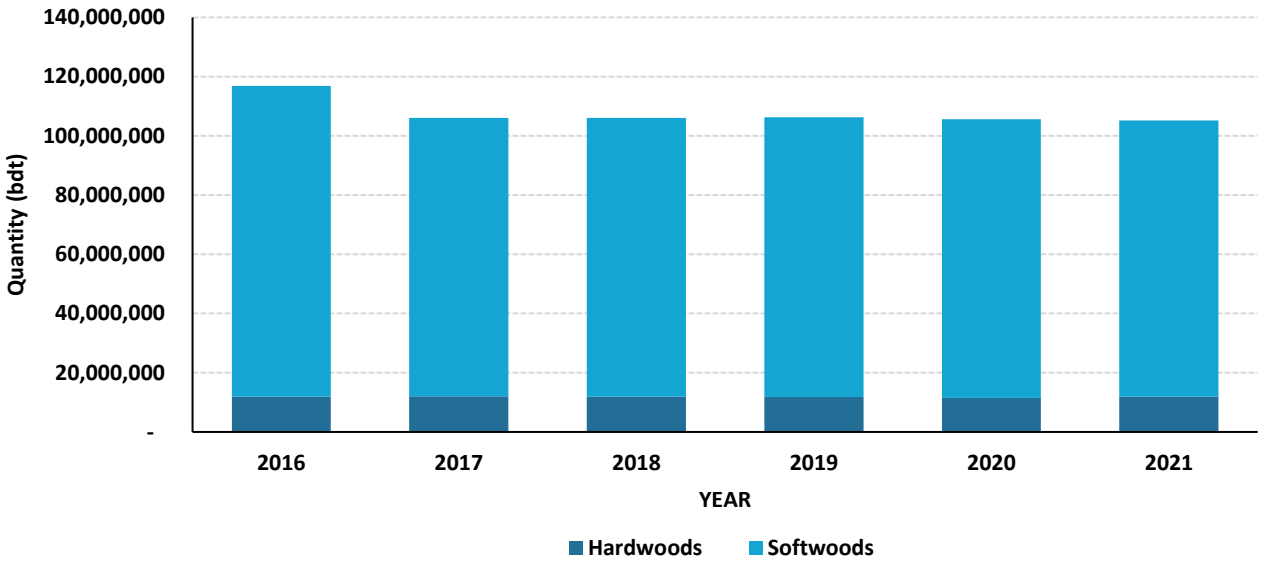
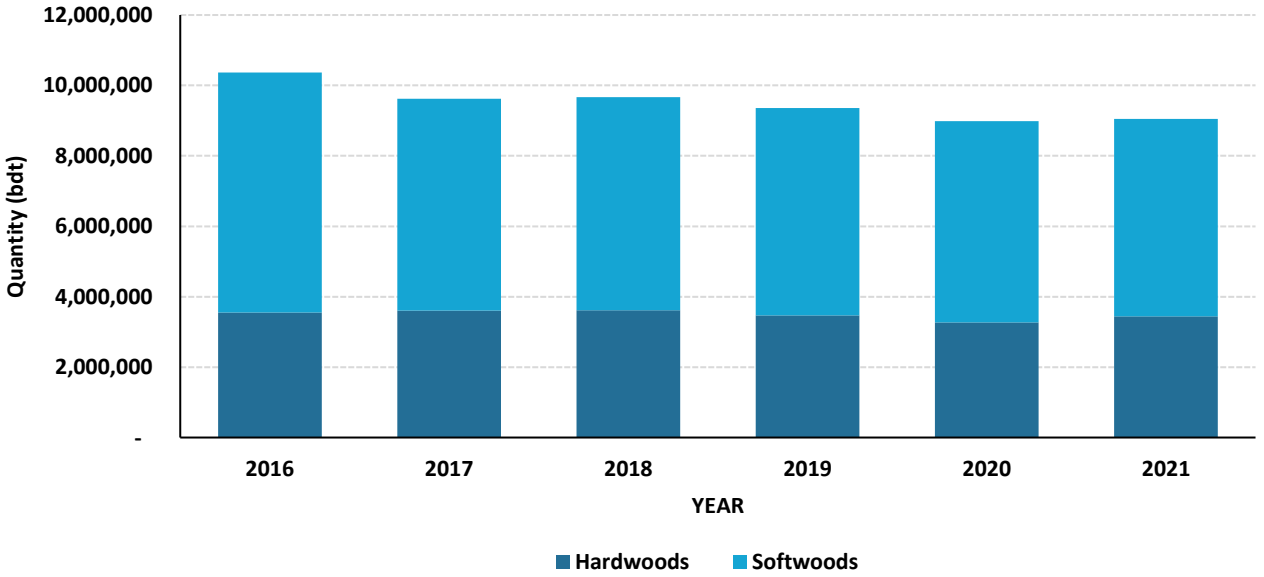
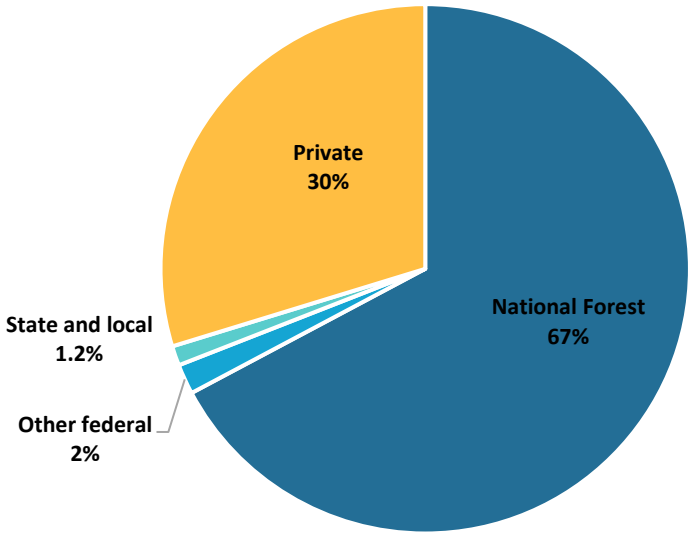


Figure E-2: Merchantable Biomass of Live Pulpwood Size Trees in the Supply Zone (2016-2021)[39]



[38] apps.fs.usda.gov/fiadb-api/evalidator. Variable 12000: Merchantable bole bark and wood biomass of live trees (timber species at least 5 inches d.b.h.), in dry short tons, on timberland
[39] Ibid.

Figure E-3. Percent Merchantable Biomass of Standing Live Trees by Ownership[40]



[40] Ibid.

Figure E-4. Percent Timber Removal by Ownership[41]

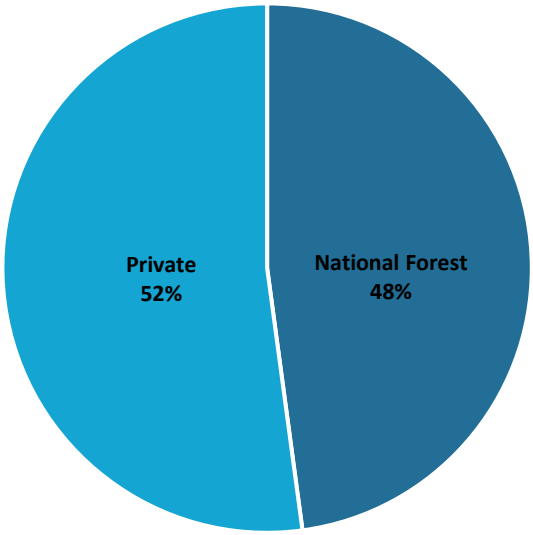
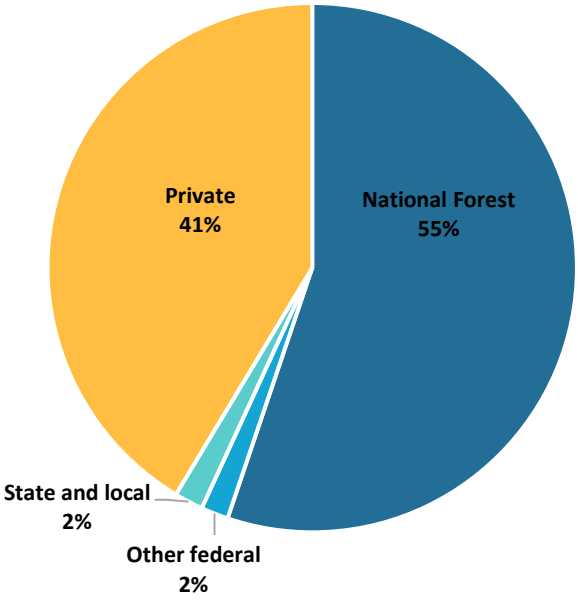
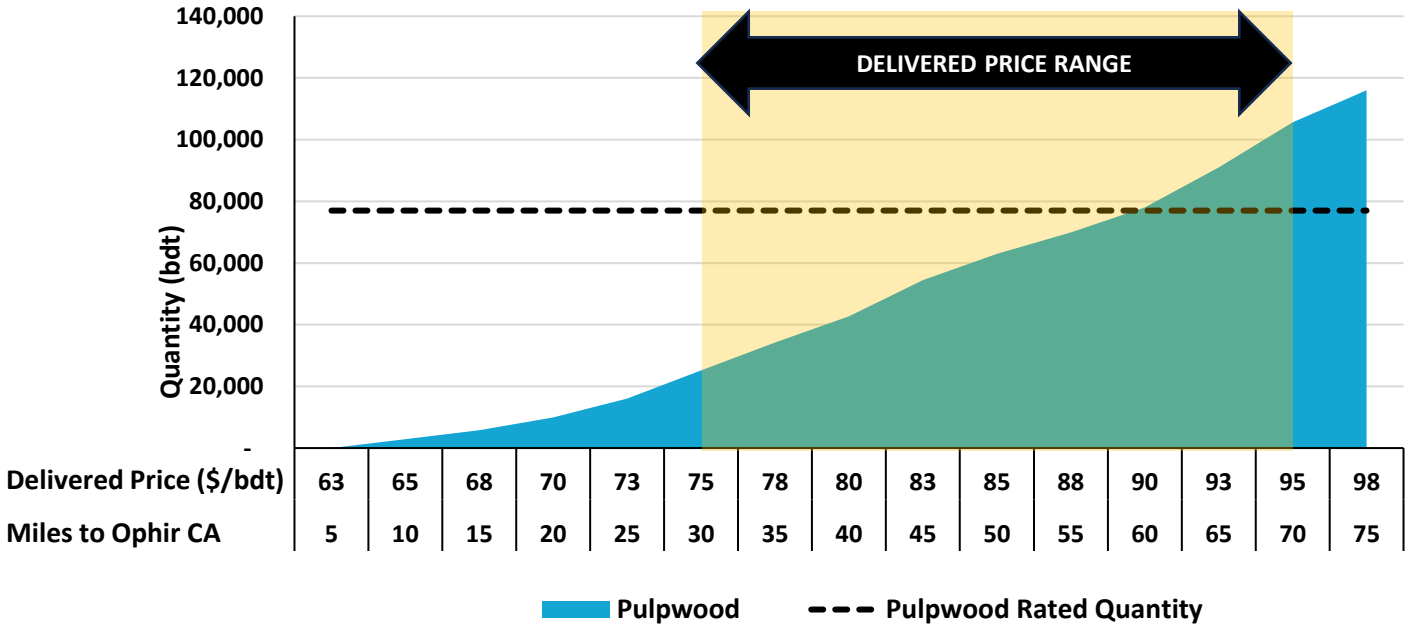


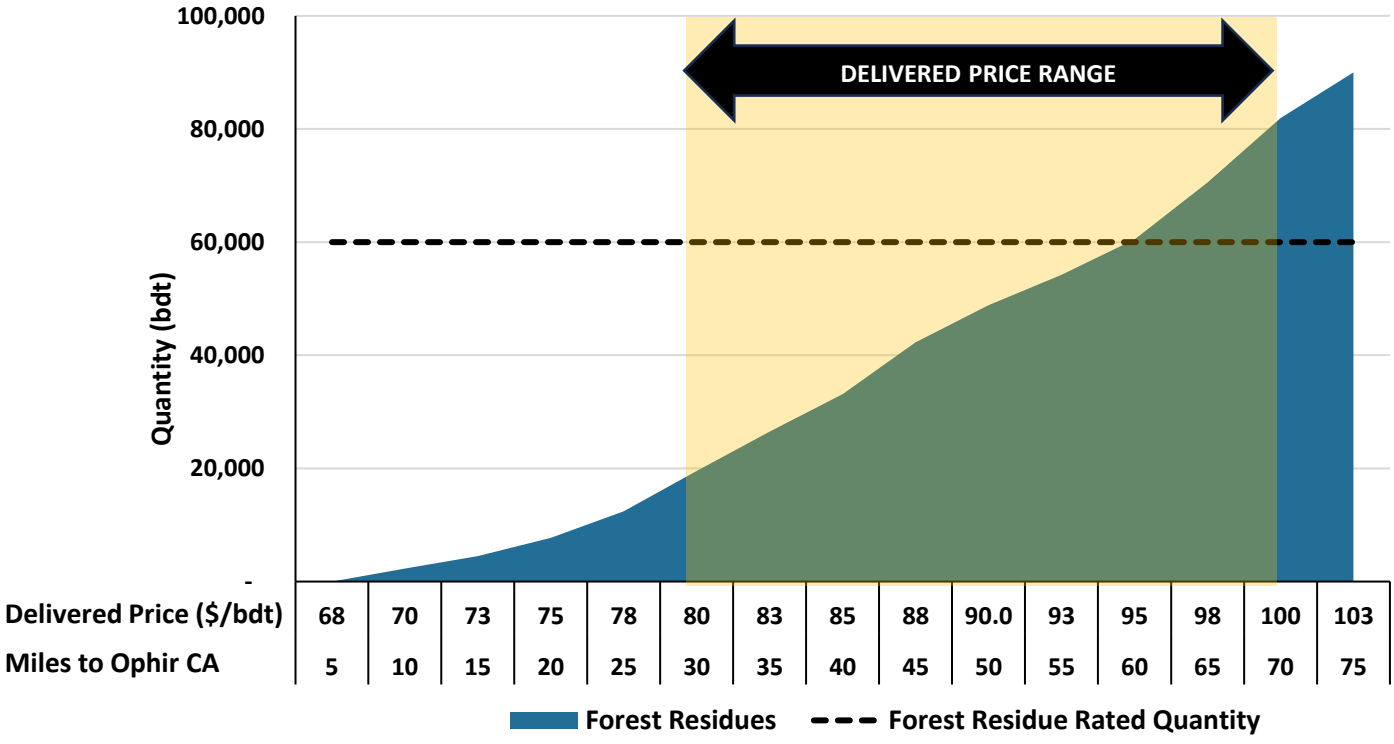
Figure E-5. Percent Timberland Area by Ownership [42]



[41] Ibid.
[42] Ibid.

Figure E-6. Supply/Marginal Cost Curves for Pulpwood and Forest Residues Generated in the Supply Zone[43]





[43] United States Department of Agriculture, Forest Service. *EVALIDator*. https://apps.fs.usda.gov/fiadb-api/evalidator.

Figure E-7. Transportation Costs ($/bdt) by Distance from Ophir, CA

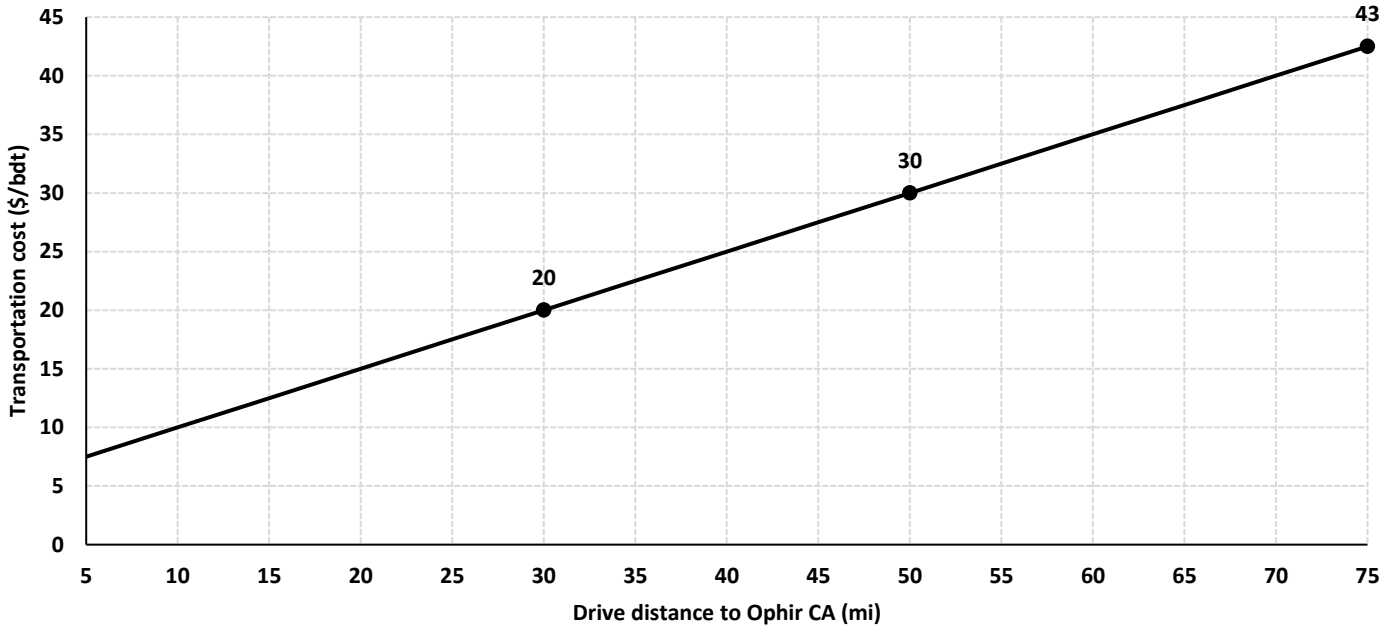
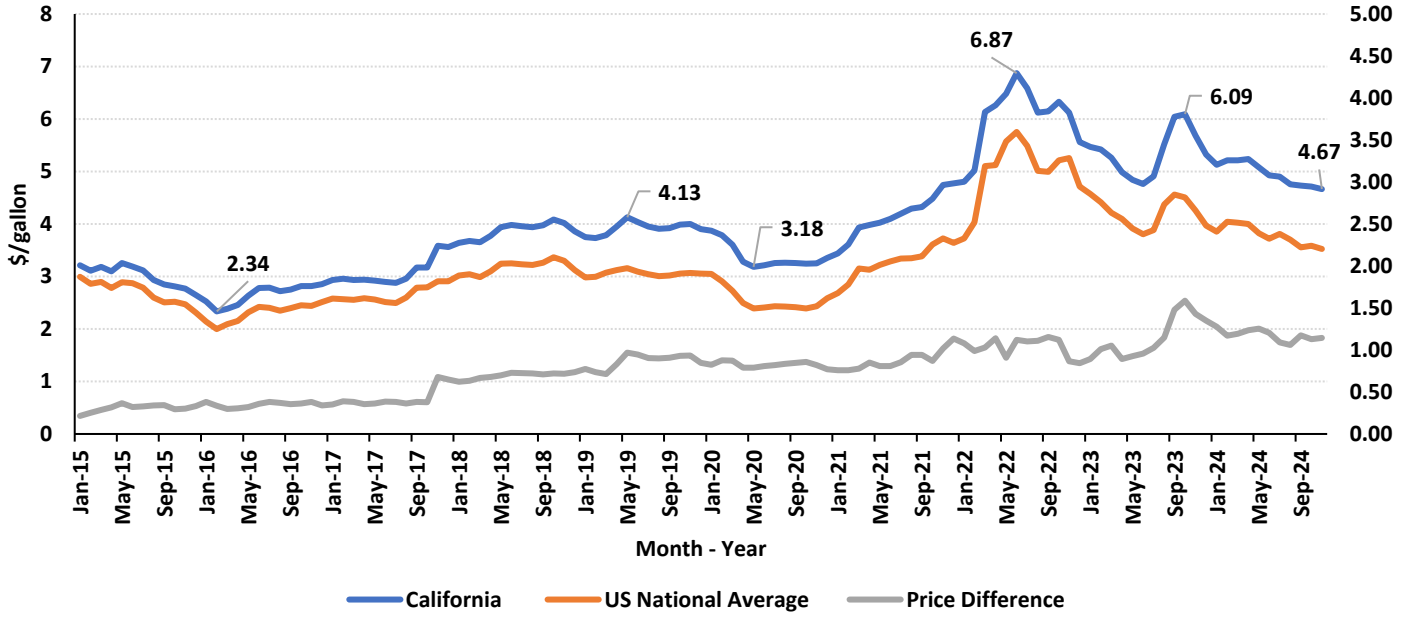


Figure E-8. Monthly No 2 Diesel Retail Price – California[44] vs US National Average[45]



[44] U.S. Energy Information Administration. "California No. 2 Diesel Ultra Low Sulfur (0-15 ppm) Retail Prices." Accessed November 26, 2024. https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXL0_PTE_SCA_DPG&f=M.

[45] U.S. Energy Information Administration. "U.S. No. 2 Diesel Ultra Low Sulfur (0-15 ppm) Retail Prices." Accessed November 26, 2024. https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXL0_PTE_NUS_DPG&f=M.

Figure E-9. Pulpwood and Forest Residue Market Prices (Forisk 2024-25 Reports, Pacific Northwest)

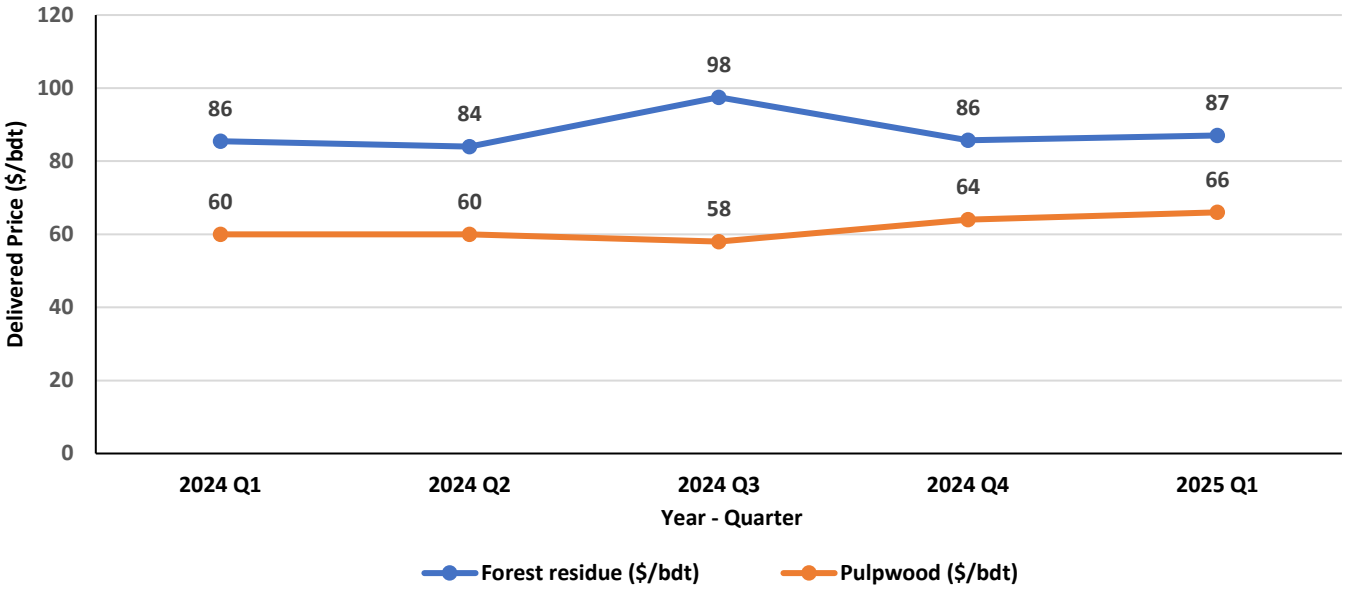
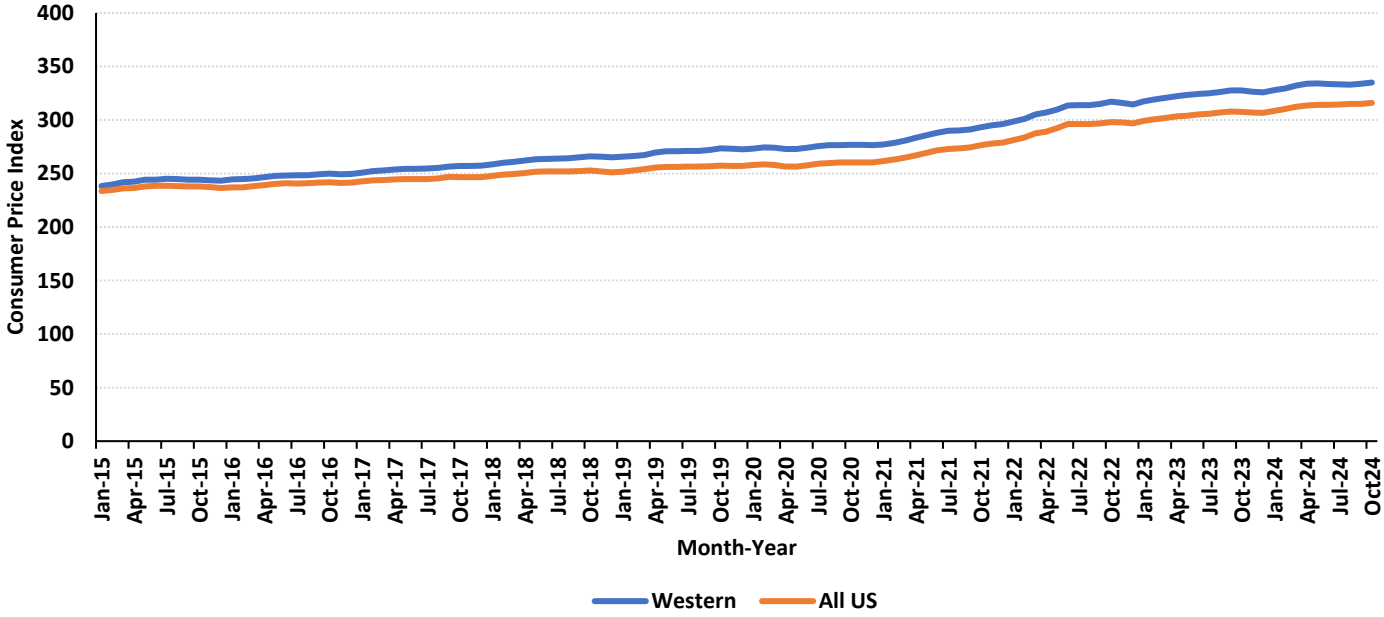
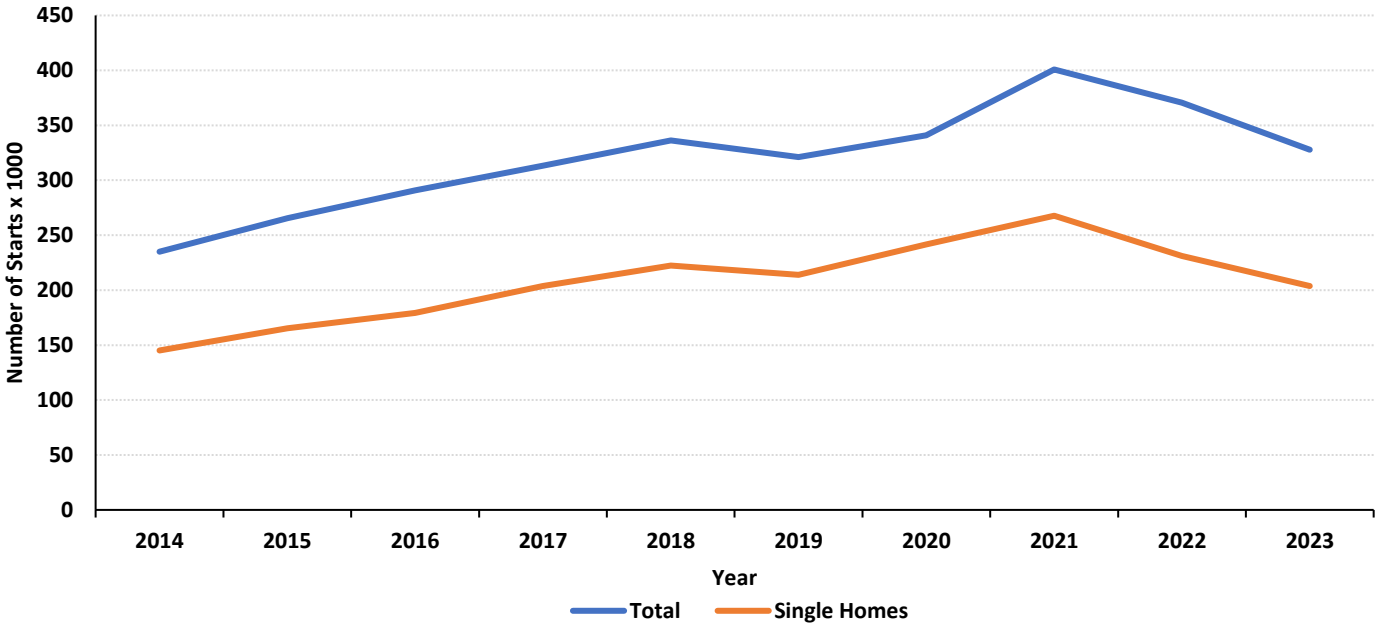


Figure E-10. Consumer Price Index – US West Region vs US National Average[46]



[46] U.S. Bureau of Labor Statistics. "Consumer Price Index CPI-U. All Items in All Western Urban and All U.S. Urban, Not Seasonally Adjusted." Accessed September 4, 2024. https://data.bls.gov/timeseries/CUUR0400SA0.

Figure E-11. Privately Owned Housing Starts US West 2014 – 2023[47]



[47] United States Census Bureau. "New Residential Construction." Accessed September 4, 2024. https://www.census.gov/construction/nrc/historical_data/index.html.

Map E-1. Location of Placer County, CA



Map E-2 Location of Industrial Site – 10505 Ophir Road Newcastle, CA

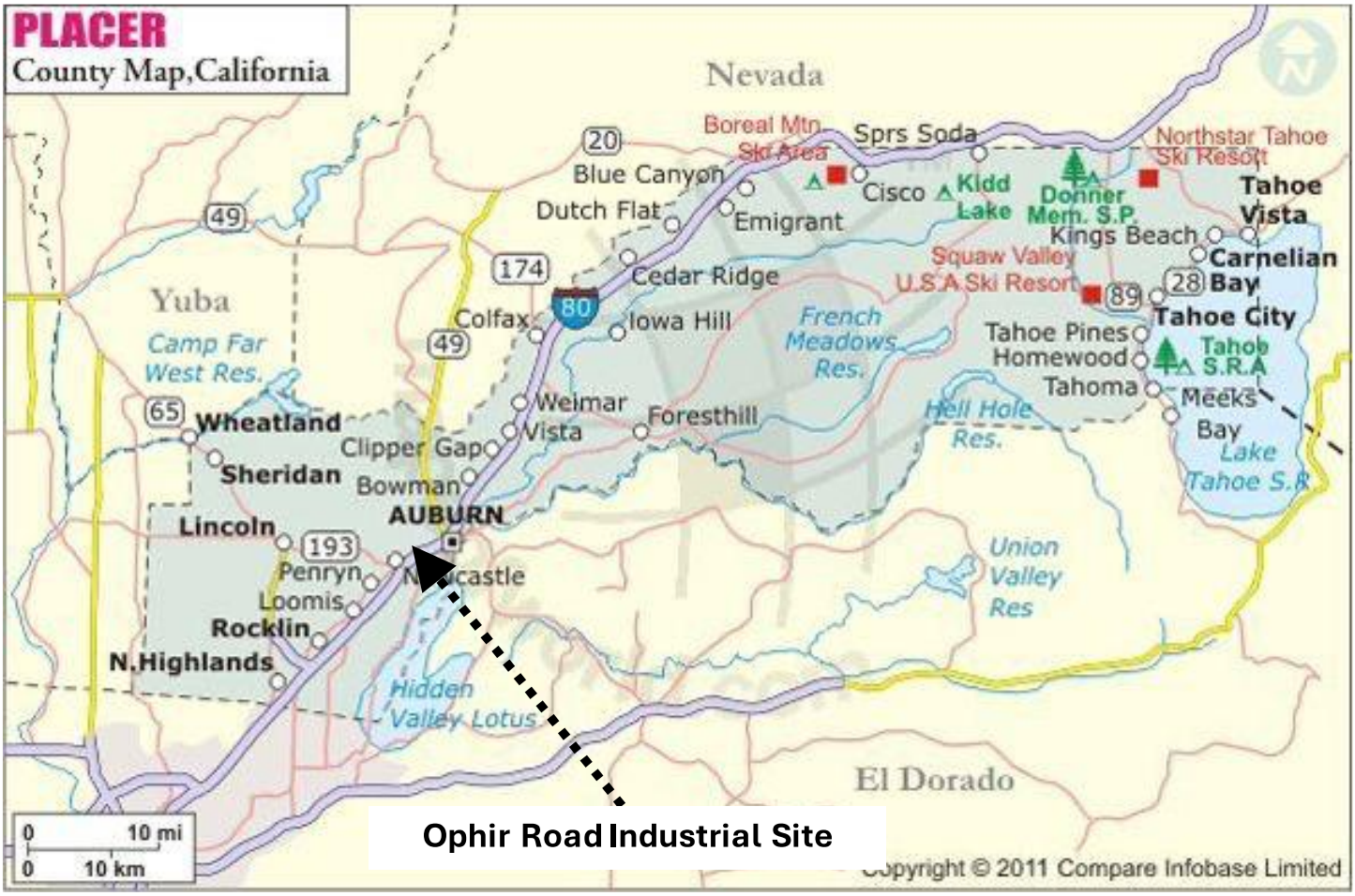


Figure E-12. Aerial Photo of Industrial Site



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