NEVADA COUNTY, CA

Biofuel Development Opportunity Zone

RATING GRADE: 'A'

Date of Issue: September 22, 2025

A
High Quality

Rating Parameters:

Category	Rated Quantity	Delivered Price	Supply Zone Size
Pulpwood	**71,700 bdt/yr**	**$75-$95/bdt**	**75-mi drive distance**
Forest Residues	**26,900 bdt/yr**	**$80-$100/bdt**	**from Grass Valley, CA**

BDO ZONE ASSETS

- 98,600 bdt/yr of woody biomass potentially available at low risk, with three times as much potentially available with higher risk profile.
- Limited competitive pressure for Pulpwood due to the absence of pulp and paper mills.
- Strong community support for utilizing biomass from forest restoration and wildfire fuel removal efforts.
- An established industrial site in Grass Valley that is industrially zoned, publicly owned by Nevada County, potentially simplifying permitting and acquisition processes.

BDO ZONE LIABILITIES

- High utility and labor costs, with electricity and natural gas significantly above national averages, and higher cost of living and average wages. Elevated local crime rates.
- Possible variations in biomass quality and quantity resulting from forest restoration, salvage, and wildfire mitigation activities.

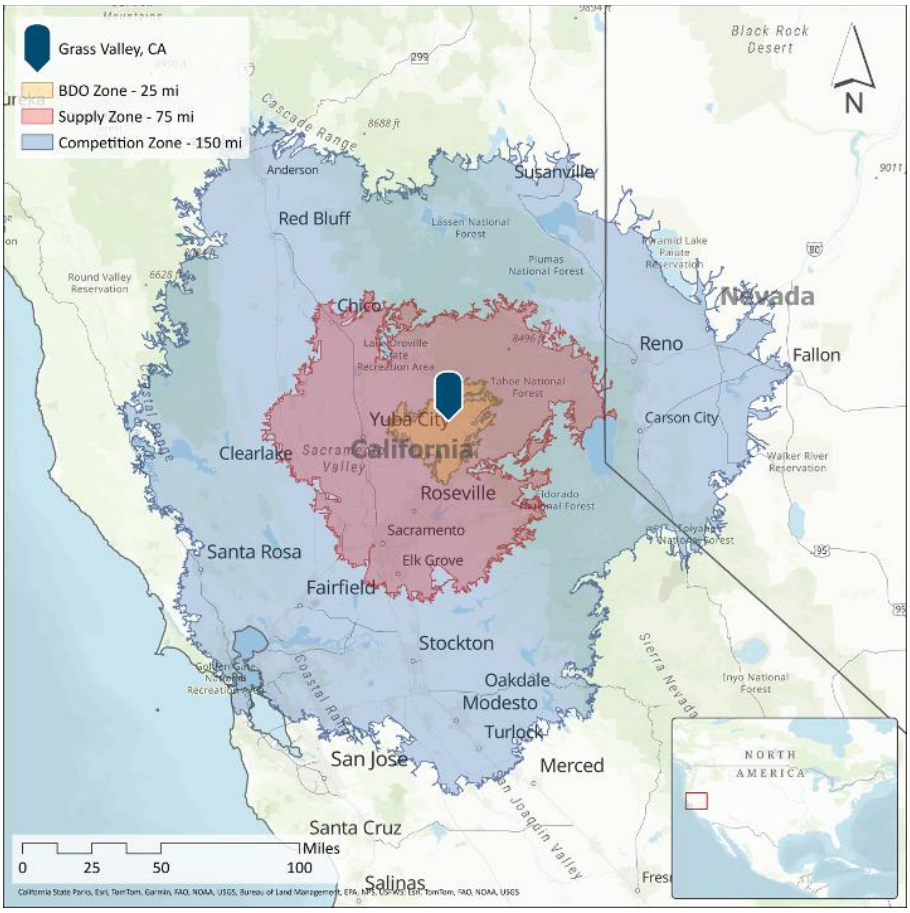
RATING GRADE

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

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

'A' ratings denote high prospective viability of Feedstock Supply and Infrastructure and low expectations of default risk in the Zone. Capacity to support new biobased plant operations is considered strong.

NEVADA COUNTY, CALIFORNIA BDO ZONE



BD OZ | THE BIOFUEL DEVELOPMENT OPPORTUNITY ZONE INITIATIVE

ANALYST NOTES

The Nevada County Supply Zone spans approximately 8,213 square miles, with over 90% of its tree species being softwoods like pine and fir. The region's forests demonstrate substantial annual net growth, with a robust growth-to-drain (GTD) ratio of 2.8, which signifies a highly sustainable harvest level and significant potential for additional biomass availability.

Public forest, predominantly National Forest, accounts for a larger share of timberland (64%), while most timber removals (57%) are conducted on private lands.

BDO ZONE ASSETS

A key asset for the Nevada County BDO Zone is its strong commitment to developing a community-scale bioeconomy, focusing on biomass generated from forest restoration and fire remediation activities. This aligns seamlessly with recent national and state legislative incentives for these feedstocks, including Nevada County's Biomass Pilot Project and its Good Neighbor Agreement with the Tahoe National Forest. The region benefits from a long-standing history of commercial logging dating back to the mid-1800s, while 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 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, as this material tends to be more heterogeneous and contaminated than traditional roundwood biomass. While overall road access to Grass Valley is good, certain forest road networks present challenges, including steep slopes, tight curves, and seasonal weight restrictions, which can impact transportation efficiency and access for chip vans.

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, recurring droughts, insect-driven tree mortality, and increased wildfire risk present a medium risk to sustainable biomass supply over typical project lifespans, though they also reinforce the need for continual wildfire mitigation efforts.

INFRASTRUCTURE PROFILE

The proposed 21.5-acre industrial site in Grass Valley represents a strong infrastructure asset. It is industrially zoned, publicly owned by Nevada County, and already hosts a small biomass waste carbonizing operation, which may simplify permitting for complementary industries. The City of Grass Valley and Nevada County are known for their pro-business stance, further supporting industrial development, and the site is located within an Opportunity Zone, offering potential tax advantages. The site has good access to State Highway 49 and Interstate 80, which are well-maintained for year-round reliability. Water connections and high-speed internet are readily available. The presence of a local hospital, comprehensive school system including vocational training in forestry, and public transportation further enhance the BDO Zone's social infrastructure. Furthermore, the area benefits from a stable labor market with a low unemployment rate and access to a broad talent pool due to its proximity to Sacramento, with various funding programs aimed at strengthening the forestry workforce. The region's adherence to sustainable forestry initiatives and environmental regulations also ensures low risk to soil, water, and wildlife, benefiting from wildfire fuel treatments.

From an operational cost perspective, utility rates for electricity (42 cents/kWh) and natural gas ($9.87/MCF) are considerably higher in Nevada County than national averages, potentially impacting the financial viability of energy-intensive operations. The cost of living and labor costs are also notably higher than national averages, which, combined with a reported aging forestry workforce and a shortage of truck drivers, presents a medium risk for workforce recruitment and retention. The region also faces more stringent permitting processes compared to other BDO Zones, and there are limitations in existing wastewater infrastructure in parts

of Grass Valley. Local crime rates are higher than national averages.

The overall 'A' rating for the Nevada County BDO Zone, with a score of 17.30 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 (Grass Valley, 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 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 Nevada County, CA is ***17.30 out of 100, resulting in an 'A' designation.***

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



SECTION A: RISK INDICATOR SUMMARY

Figure A-1. Average Loaded RI Scores for Each Risk Factor

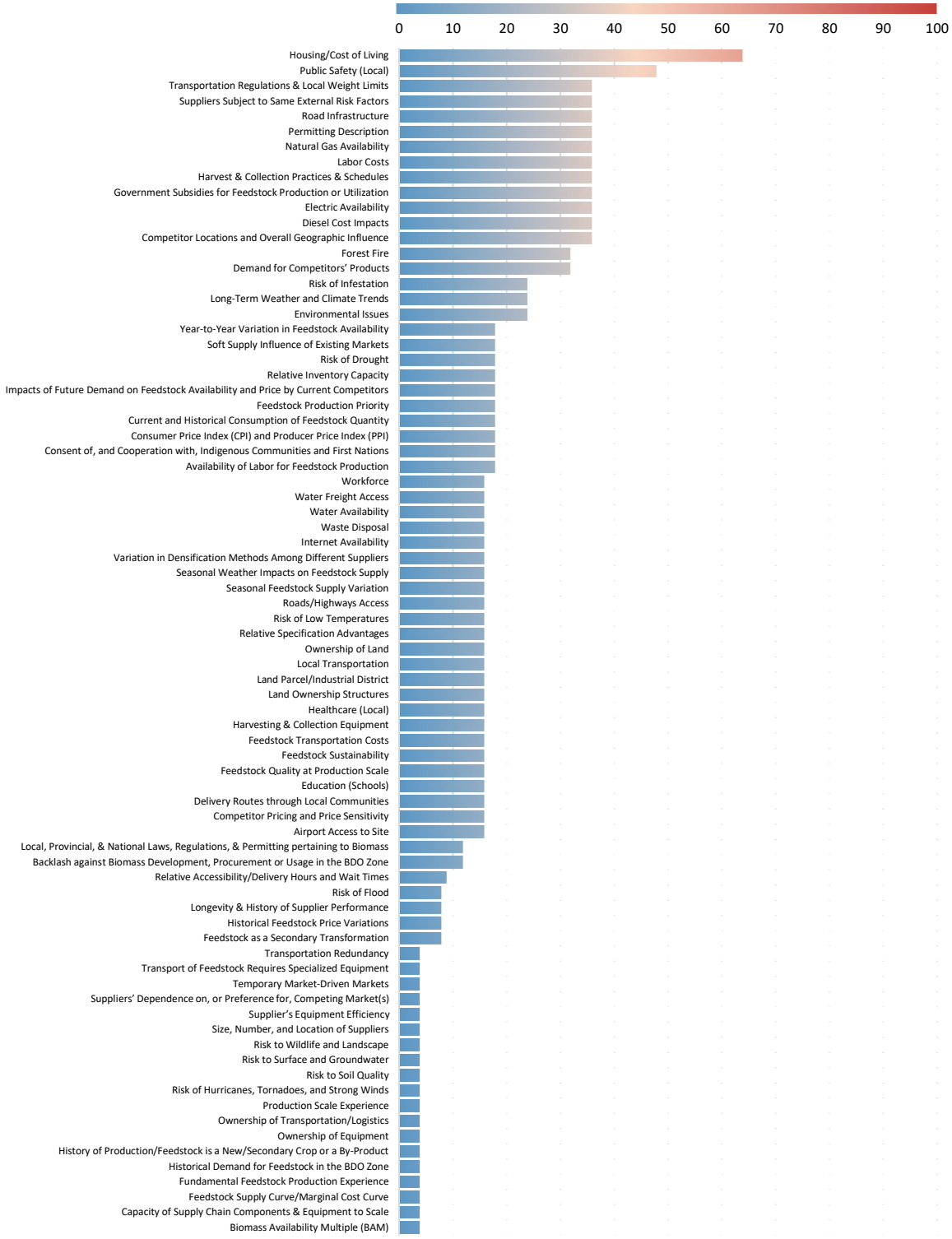


Table A-1. Risk Indicators and Associated Scores

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)	4	4	16	50%	8
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	32	NN	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	4	4	16	NN	16
5.1.2 Ownership of Land	4	4	16	NN	16
5.1.3 Permitting Description	6	6	36	NN	36
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	NN	36
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	4	4	16	NN	16
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)	8	6	48	NN	48
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	**17.30**

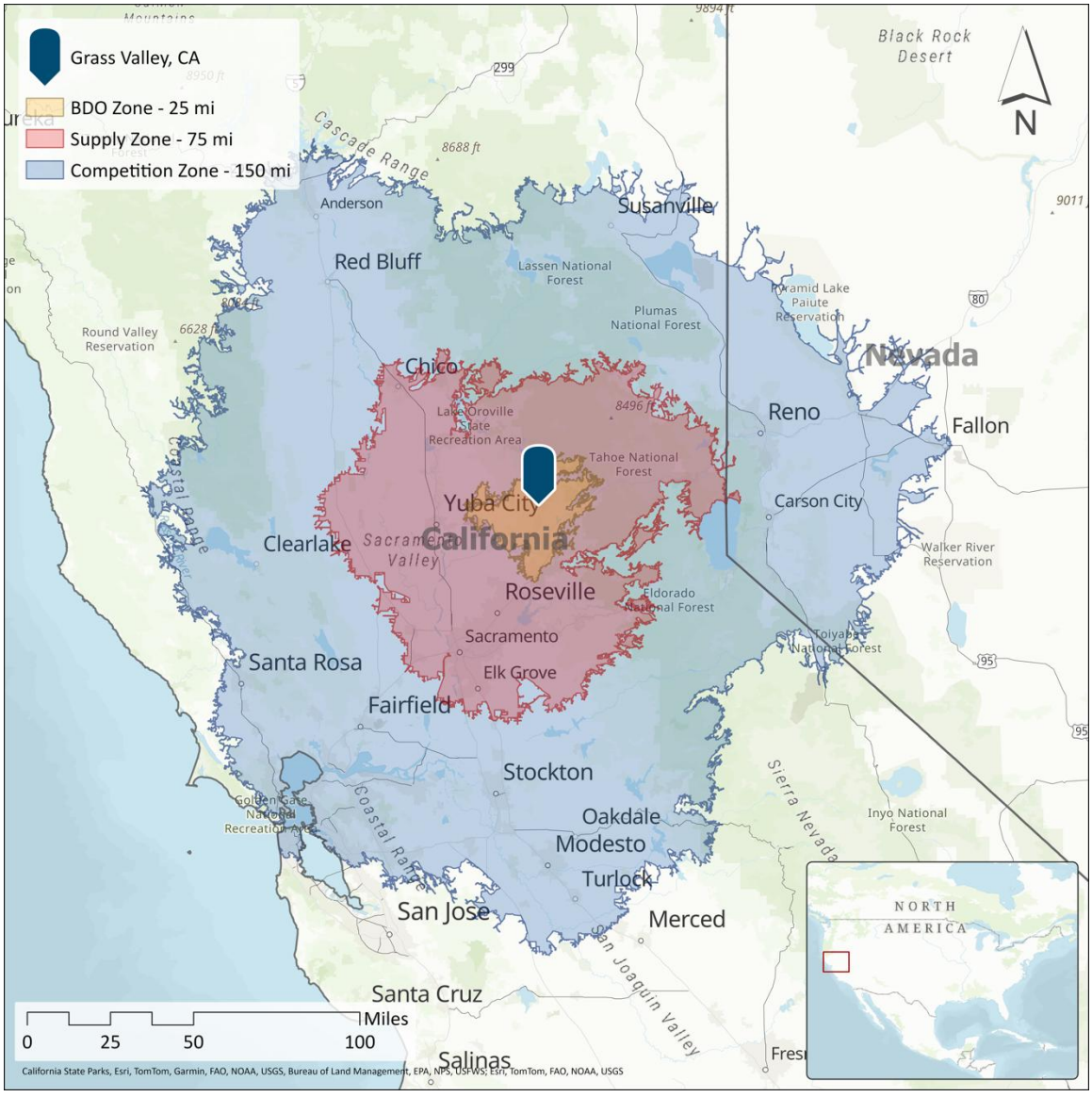
SECTION B: BIOMASS AVAILABILITY AND PRICING

OVERVIEW

This section assesses the availability and pricing of woody biomass for bioenergy, biofuels, and other bio-based uses within the Supply Zone. Grass Valley, CA, serves as the geographic center for this evaluation.

The analysis is structured around three defined zones as illustrated in Map B-1: the BDO Zone, the Supply Zone, and the Competition Zone. The BDO Zone encompasses areas within a 25-mile drive of Grass Valley and represents the potential project location. The Supply Zone extends 75 miles from the center point, delineating the area where new projects would likely source woody biomass. The Competition Zone, with a 150-mile radius, includes facilities that may influence feedstock availability in the Supply Zone.

Map B-1. BDO, Supply, and Competition Zones



The Supply Zone covers approximately 8,213 square miles across 15 California counties, while the Competition Zone extends across 35,850 square miles. Softwoods constitute over 90 percent of tree species in the region, predominantly pine and fir. Appendix E, Table E-1 provides a detailed listing of counties within the Supply Zone. This assessment assumes competitors generally limit their biomass procurement to 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 fails 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. 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. Large volumes of Forest Residues are also utilized by biomass power and CHP plants (Table B-4).

SUPPLY ANALYSIS

Pulpwood

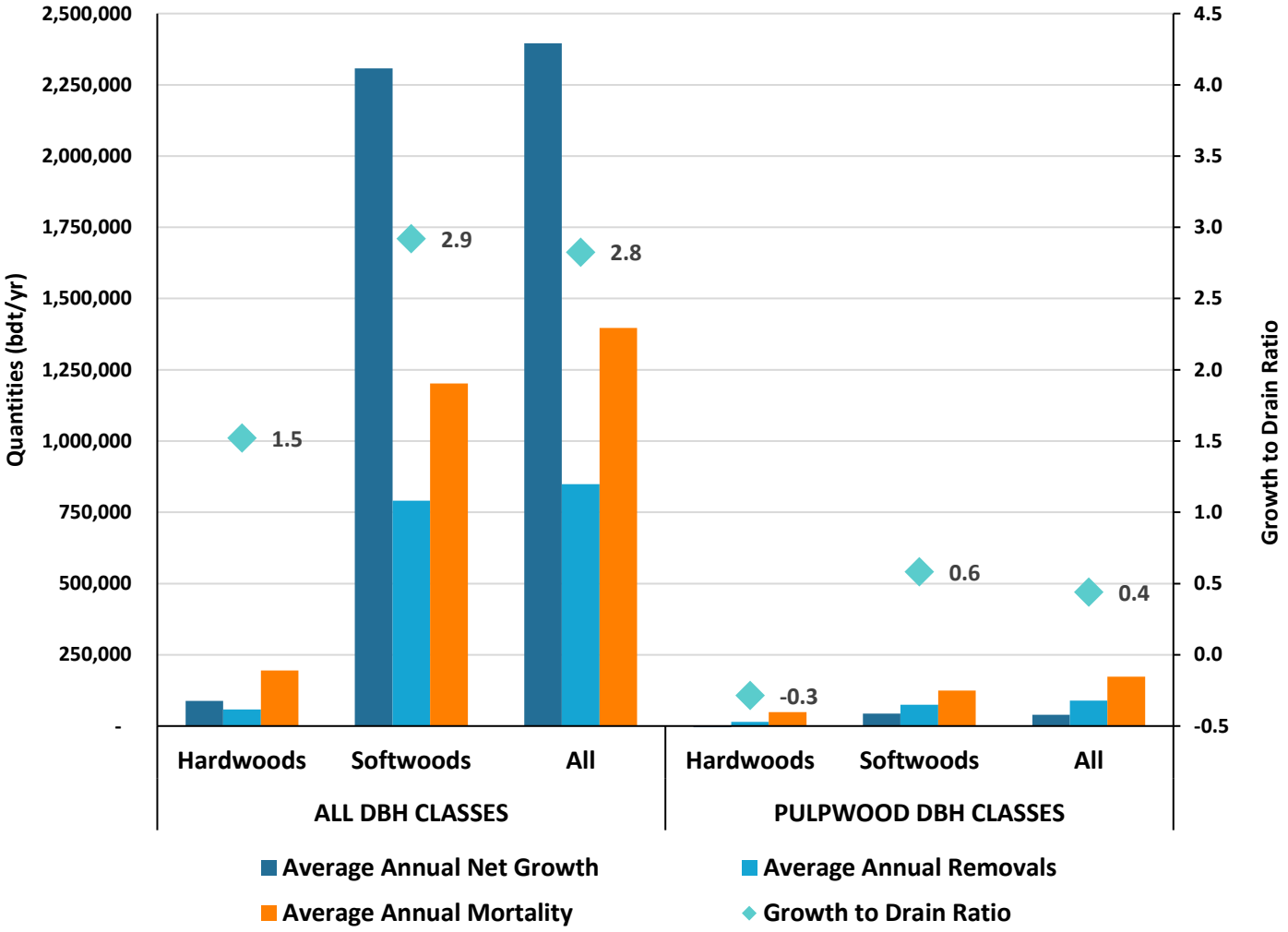
The Supply Zone generates spruce, pine, fir sawlogs, and pulp logs, with full stem harvesting and transportation being the primary logging practice in the area. Salvage of dead trees, fire remediation efforts, and forest restoration activities also take place within the Supply Zone. These operations incur significantly higher costs than traditional commercial harvesting due to lower productivity and limited accessibility. Wildfire fuel mitigation funding helps offset some of these costs, reducing the delivered cost of biomass from fuel reduction efforts. Nevertheless, a significant portion of the biomass produced from these treatments is either piled and burned or masticated and left on site. A new biomass project in Grass Valley could capitalize on these fuel reduction treatment materials, alongside 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.

[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]



Forests in the Supply Zone grow approximately 2.4 million bdt of timber annually. Of that, about 848,000 bdt are harvested each year, resulting in a GTD ratio of 2.8, which exceeds the sustainability threshold of 1.2. In other words, each year there is 2.8 times as much biomass added to the Supply Zone as is taken out, providing for sustainable harvesting levels with plenty of room for additional harvests.

The FIA data estimated that approximately 90,000 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 48,000 bdt/yr while reducing wildfire risk. Furthermore, approximately 57,000 bdt/yr

[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

of dead Pulpwood-size trees could be salvaged[5] (Figure B-1). Additionally, FIA data indicates that approximately 35,000 bdt/yr of Pulpwood Logs[6] 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 230,000 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 Production, Utilization, and Availability Estimates

Source	Quantity (bdt/yr)
Pulpwood Harvest	90,000
Pulpwood Logs	35,000
Pulpwood Salvageable Mortality	57,000
Pulpwood Thinnings	48,000
Total Pulpwood Available	**230,000**

Forest residues

Data from the United States Department of Agriculture (USDA) Forest Inventory Analysis (FIA)[7] indicate that approximately **241,000 bdt** of Forest Residues are produced annually in the Supply Zone through harvesting and salvage activities. These residues include tops and branches left after logs are removed. They are processed on site using grinding or chipping equipment and, if used commercially, then transported to a facility using chip vans.

Local experts confirm that the necessary grinding and chipping equipment is available. However, steep slopes and tight curves on forest roads often restrict chip van access to remote harvesting areas.

Sawmill Residues

Two sawmills located within the Supply Zone have a combined annual capacity of 360 million board feet of lumber. These sawmills generate biomass byproducts, including wood chips, sawdust, shavings, and bark, that are widely utilized in producing wood-based products and in energy applications such as process heat and electricity generation.

Together, the facilities consume approximately 1.18 million bdt of sawlogs each year to support full-scale operations. Table B-2 outlines the estimated quantity of sawmill residues available in the Supply Zone.

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**

[5] 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).
[6] 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
[7] U.S. Department of Agriculture, Forest Service. "Forest Inventory and Analysis." https://research.fs.usda.gov/programs/fia.

Residues produced by the two sawmills in the Supply Zone are considered **inaccessible to new projects**. This conclusion reflects both the absence of feedback from the sawmills on availability and input from local experts, who report that all sawmill byproducts are currently allocated to existing competitors.

COMPETITION ANALYSIS

As shown in Map B-2 and Table B-3, 12 competitors are currently active within the Competition Zone. These facilities primarily utilize chipped wood, sawdust, and bark. The competitor group includes an engineered wood products (EWP) plant, two producers of wood pellets, four biomass power operations, and five combined heat & power (CHP) facilities.

Map B-2. Biomass Competitors in the Competition Zone

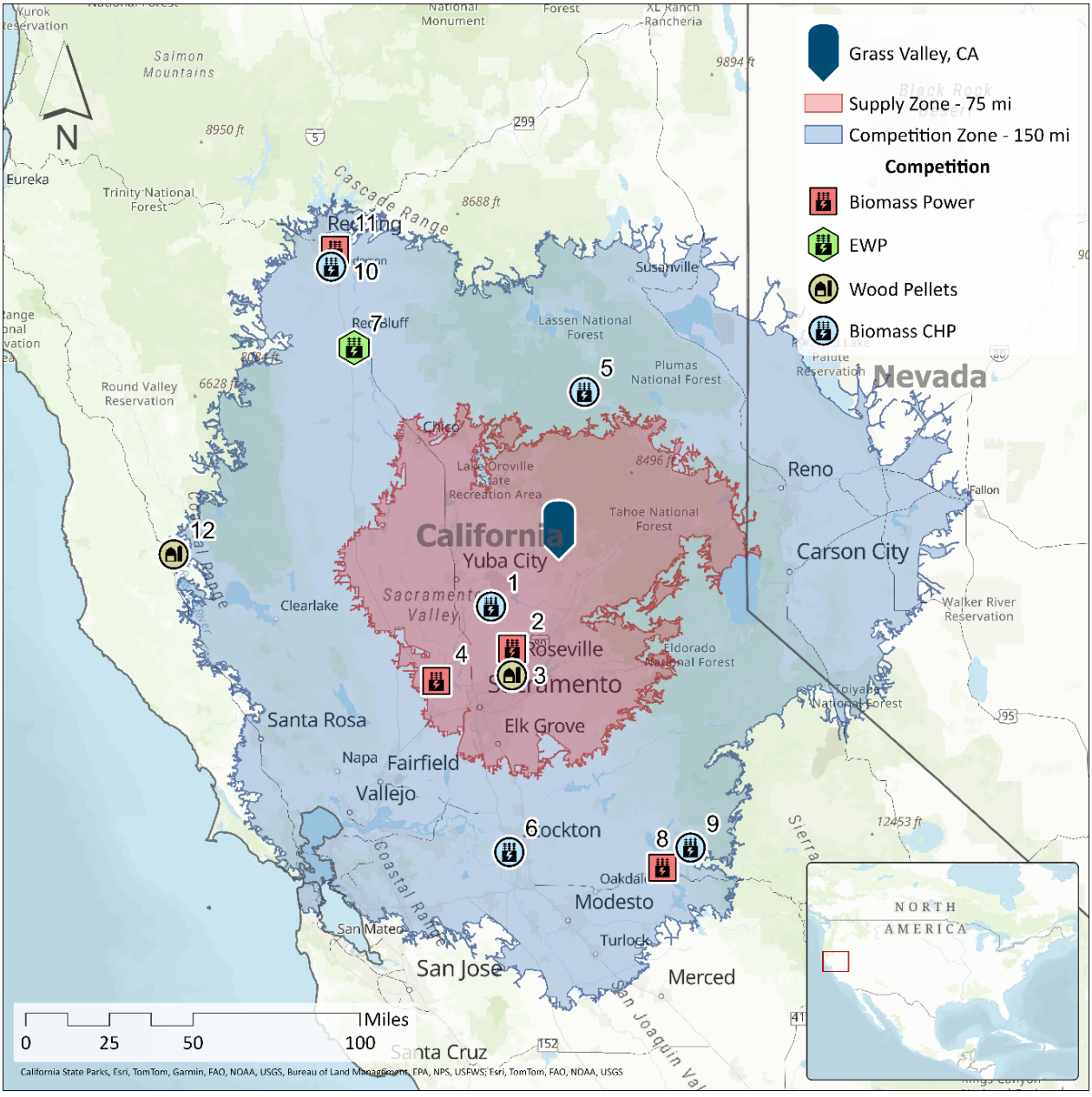


Table B-3. Current Biomass Consumers in the Competition Zone

# 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 Ltd - 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' Annual 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/yr)[8]
Engineered Wood Products	1	97,000	0	0
Wood Pellets	2	149,000	80,400	0
Biomass CHP	5	1,157,500	261,600	10,000
Biomass Power	4	1,017,000	219,200	165,400
Totals	**11**	**2,182,000**	**561,200**	**175,400**

A competitor's influence on the wood supply available to a new project depends on two main factors: distance from the BDO Zone center and the type of feedstock used. Facilities located farther from the center point generally exert less influence, given the reduced overlap with the 75-mile Supply Zone.

Wood pellet producers typically rely on residual wood chips from sawmills, which do not reduce 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 and Forest Residue in the Supply Zone is estimated at 175,400 bdt/yr.**

Additional future competition may emerge from two announced wood pellet facilities. The Tuolumne Bioenergy Project, located near Sonora, 121 drive miles from Grass Valley, 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

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

10,000 bdt/yr of feedstock from the Supply Zone. The Golden State Natural Resources Project, located near Jamestown, 119 drive miles from Grass Valley, 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].

As shown in Table B-5, total feedstock availability has been calculated after factoring in timber growth and demand from existing competitors. For a new project in Grass Valley, approximately **215,000 bdt/yr of Pulpwood and 80,600 bdt/yr of Forest Residues, a total of 295,600 bdt/yr,** are projected to remain available.

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	230,000	15,000	215,000
Forest Residues	241,000	160,400	80,600
Sawmill Residues	348,000	348,000	-
Totals	**845,000**	**523,400**	**295,600**

RATED QUANTITIES AND PRICING

Table B-6 summarizes the 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	215,000	3.0	71,700	75-95
Forest Residues	80,600	3.0	26,900	80-100
Totals	**295,600**		**98,600**	

Table B-7 provides estimated unsubsidized delivered price ranges for Pulpwood and Forest Residues within a 75-mile haul 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.

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

Table B-7. Rated Quantities and Delivered Price Ranges of Biomass in the Supply Zone

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

In the Supply Zone, Pulpwood harvesting crews typically consist of five to seven workers and generate around 60 truckloads per week. Each load carries about 14 bdt of logs. The number of trucks and drivers needed depends on haul distance, which averages 50 miles to the mill, resulting in up to four roundtrips per day. A biomass facility aiming to process 71,700 bdt of Pulpwood annually would need to add roughly two logging crews, or 12 personnel, along with nine additional log trucks and drivers. Forest Residue is processed by feeding woody material into a chipper that loads chips directly into transport vans. A typical chipping crew includes two or three people. To process 26,900 bdt of Forest Residues per year, two more crews, along with three additional trucks with chip vans and drivers, would be required.

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 Nevada 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 Good Neighbor Authority, with Nevada County having a specific Good Neighbor Agreement with the Tahoe National Forest.

Nevada County itself promotes biomass access through its Biomass Pilot Project (initiated in 2025), which processes unmerchantable wood from forest health and fuels reduction projects into biochar, reducing wildfire risk and air pollution while providing feedstock. However, county-level efforts defer to state permitting for actual harvesting. No county-specific

[10] 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.

[11] 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.

permits override state rules; instead, the county facilitates projects via strategic plans and fuel reduction initiatives, including the Good Neighbor Agreement approved in 2024.

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 Nevada County, fuel reduction is supported by multiple state-identified priority projects (part of CAL FIRE's 45-Day Report), and the county's Good Neighbor Agreement with USFS facilitates extraction on federal lands, such as the Truckee Ranger District Roadside Hazardous Fuel Reduction project. 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 Northern Sierra Air Quality Management 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 Nevada County-specific changes are 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



Nevada County Ownership
21.5 ACRES

PROPERTY OVERVIEW

Address:	12270 La Barr Meadows Rd.
City:	Grass Valley, CA
County:	Nevada
Acres:	+/- 21.48 Acres
Pricing Note:	Open
Lease Available:	Yes, Preferred
Topography:	Graded / lose dirt
Zoning:	M-Industrial
Building on Site:	No

SITE CONTACT

Craig Griesbach
Director of Emergency Services
Nevada County California
950 Maidu Avenue, Suite 129
Nevada City, CA 95959
530-265-1583
Craig.griesbach@nevadacountyca.gov

ADDITIONAL NON-RATED SITES

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

PROPERTY PROFILE

This 21.5-acre, industrial-zoned parcel is located in Grass Valley, CA, and is currently occupied by a small biomass waste carbonizing operation on five of the available acres. Nevada County is seeking a complementary bio-economy business to co-locate and share in updating electric and wastewater utilities. There is good highway access with I-80 11 miles to the south, and rail 15 miles away in Colfax, CA. Refer to Section E for additional site and map information.

Transportation / Logistics

Rail Served: No
Rail Accessible: Not at the site
Rail Infrastructure in Place: No. Amtrak and Union Pacific freight in Colfax, CA, 15 miles
Nearest Highway: State Highway 49
Nearest Interstate: I-80, 11 miles
Nearest Airport: Nevada County, five miles
Nearest Commercial Airport: Sacramento, CA (SMF) 64 miles. Full passenger and freight services In Colfax, CA, 15 miles

Electric Service

Supplier: Pacific Gas & Electric
Ownership: Investor-Owned Utility
Phone: 877-660-6789
Website: https://www.pge.com/
Utility Extends to Site: No
Nearest Substation:< 2 miles
Capability: 25kV Service is available across the street from the site. No distribution lines are in place serving the parcel.

Natural Gas

Supplier: Pacific Gas & Electric
Ownership: Investor-Owned Utility
Phone: 877-660-6789
Website: https://www.pge.com/
Size of Pipe: 6" available.
Pressure: 50 psi
Capability: Gas line serves the adjoining the parcel. New service would only require meter base and site piping.

Water

Supplier: Nevada Irrigation District, CA
Ownership: Municipal
Phone: 530-273-6185
Website: https://www.nidwater.com
Size of Main: 12"
Peak Capacity: <1,000.000 gals/day
Capability: Pipelines run to the site

Wastewater

Supplier: City of Grass Valley, CA
Ownership: Municipal
Phone: 530-274-4371
Website: www.cityofgrassvalley.com/
Size of Main: 6"
Capability: No current wastewater or sewer system at the site. < 1 mile away

Telecommunications

Supplier: Xfinity Communications
Ownership: Private
Phone: 800-934-6489
Website https://www.xfinity.com/
Platforms: Fiber, Cable, Wireless
Capability: Primary wireless and fiber optics available up to 2Gbps

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: The Supply Zone's commercial logging history dates back to the mid-1800s, driven by the gold rush and railroad industry development. Currently, two sawmills owned by Sierra-Pacific Industries maintain steady production in the zone, contributing approximately 360 million board feet of lumber annually. Established in 1949, Sierra-Pacific Industries ranks as the second-largest lumber producer in the United States, demonstrating substantial financial stability. The long-established presence and operational continuity of major suppliers indicates low risk regarding supplier solvency and performance reliability.

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)* 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	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 8 out of 100.	**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)	**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) 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: Timberland ownership in the Supply Zone is predominantly held by the National Forest Service, accounting for 64% of the total area. Private ownership comprises 34%, while state and other federal entities each control 1%. Despite this distribution pattern, approximately 57% of timber removals originate from private land, with National Forest lands supplying the remaining 43%. The substantial federal and state ownership introduces medium risk to biomass procurement, as changes in public land management policies or priorities could significantly impact resource accessibility and harvesting permits.

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 (including the Good Neighbor Agreement between Nevada County and USFS's Tahoe National Forest[12]) 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	**Score**

[12] The Good Neighbor Agreement (GNA) between Nevada County, California, and the USDA Forest Service (USFS), specifically the Tahoe National Forest, is a cooperative framework authorized under the Agricultural Act of 2014 (Pub. L. 113-79, section 8206, 16 USC 2113a) and expanded by the 2018 Farm Bill. It enables Nevada County and the USFS to collaborate on forest management projects to enhance wildfire resilience, forest health, and community safety across federal and private lands in the county. The agreement was approved by the Nevada County Board of Supervisors on July 9, 2024, for a decade-long collaboration (Source: https://nevadacountyca.gov/CivicAlerts.aspx?AID=7670&ARC=10614)

The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**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 who maintain ownership of their equipment. When additional capacity is temporarily required, these contractors typically subcontract with other logging companies rather than leasing equipment from third parties. The standardization and availability of logging and chipping equipment have increased in recent years, driven by widespread fuel reduction and salvage operations in response to wildfire activity. This equipment ownership pattern translates to very low risk for biomass supply chain reliability, as contractors maintain direct control over their operational assets and scheduling flexibility.

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**

1.3.3 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 in the Supply Zone commonly own trucks, allowing operational flexibility in meeting delivery commitments. For contracts requiring expanded transportation capacity, they secure additional support by hiring truck drivers or engaging independent truck owner-operators. This ownership situation results in very low risk to biomass delivery reliability. The vertical integration of harvesting and transportation services among suppliers eliminates handoff points and coordination challenges that might otherwise disrupt biomass delivery schedules.

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.

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

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

Risk Information: The Forest Residue portion of the rating, which makes up 27% 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 72% of rated feedstock quantity, renders the risk associated with RI 1.3.4 as low. On balance, therefore, the risk 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) 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.	**50%**

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 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.

Risk Information: The risk assessment suggests minimal concern due to the substantial expertise in feedstock production across the Supply Zone. Logging operators, forest management experts, and processing facilities exhibit considerable collective experience with the specified feedstock types. This well-established knowledge base covers harvesting methods, quality control protocols, and processing needs tailored to regional biomass resources. The extensive industry experience greatly lowers the risk of supply interruptions from operational inexperience, with negligible effects expected 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)* **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**

1.4.2 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 Grass Valley. 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: Suppliers bring extensive knowledge and experience in biomass harvesting, handling, and transportation. Key operations include log harvesting and thinning processes, often accompanied by in-woods chipping activities. The equipment utilized during these operations reflects industry. This established base represents very low risk related to equipment efficiency, as suppliers maintain machinery capable of meeting production requirements for biomass recovery and processing.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	2
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 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, 67% of potentially available woody biomass is dependent on the sawmilling industry, and 33% 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 67% of rated woody biomass is considered medium. Risk regarding the remaining 33% 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). *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 25%.	**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-3 and Table B-4, Section B), of which four are located in a cluster at a relatively short distance to Grass Valley. 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)*	**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** **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 Supply 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 Grass Valley will be able to establish a strong market position.

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**

2.1.3 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 Supply 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: Due to the lack of pulp and paper mills in the Competition Zone, demand for Pulpwood is limited and there is minimal competitive pressure on pricing. Delivered prices for Pulpwood reflect a total cost of $75 to $90 per bdt, including $45 to $60 per ton for stumpage and logging, plus around $30 per ton for hauling over an average distance of 50 miles. For Forest Residues, hauling costs are similar, but processing costs are higher, ranging from $50 to $70 per ton, due to increased labor and fuel requirements. At market rates, these costs make the material economically unviable without intervention. However, subsidies from state and federal programs currently lower delivered costs to between $40 and $60 per ton. End users depend on these subsidies to maintain feedstock affordability. Despite this dependency, competition from other buyers is limited, and the risk of price increases driven by market demand remains 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**

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

Rationale: Feedstock utilization in a Supply 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 Supply Zone.

Risk Information: No capacity expansion announcements from existing competitors in the Supply Zone were found. This does not rule out future expansions, particularly with county, state, and federal incentives and mandates supporting forest fuel reduction goals. Regarding proposed projects, the two announced facilities are expected to have minimal impact on the Supply Zone due to their distance. Lastly, there is uncertainty about potential future competition that remains unannounced or unidentified but may be in early development stages.

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) 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 partnerships exist between suppliers and biomass consumers, particularly those located near each other. These established connections often extend beyond written agreements, including operational familiarity, consistent payment reliability, and a mutual understanding of quality expectations. During periods of supply scarcity, suppliers typically prioritize these long-term clients, which could limit supply access for new market entrants. This relationship dynamic creates a medium risk to supply security for new projects, as they must overcome the advantages of entrenched market players to secure dependable supply chains.

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. 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%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **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 found in the Supply Zone. The lack of such markets greatly lowers the risk of short-term supply shortages and price spikes. This market stability offers project developers increased confidence in consistent resource availability, unaffected by external market fluctuations.

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**

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. 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: Uncertainty exists in determining the inventory levels held by current competitors due to limited market response. The few data points gathered indicate inventory capacities ranging from two weeks to two months. The significant presence of industrial-scale competitors for woody biomass, including nine biomass power and CHP facilities, heightens the risk that competitors' inventory capacities are relatively substantial.

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%**

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%.
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100. **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 low, therefore the RRL is 4 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed low, therefore the RRI is 4 out of 10. **6**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **36**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **75%** 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%.
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 Supply 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)* 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**

2.2.4 Demand for Competitors' Products

Rationale: Increased demand for the competitor's final product can cause an 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 Supply Zone.

Risk Information: The majority of competitors in the woody biomass industry focus on producing power or combined heat and power, which heightens the risk of reduced availability and increased costs for woody biomass due to expected growth in demand for biomass power. Driven by the need to handle rising volumes of forest biomass from fuel reduction efforts, state-level policies have introduced regulations mandating utilities to enhance their procurement of biomass power. These include SB 1109 (2022), which expanded and extended requirements for electric utilities to obtain energy from biomass facilities, particularly those utilizing forest waste from high-hazard fire zones. In July 2025, the California Public Utilities Commission (CPUC) adopted Resolution E-5288 to enforce these mandates, directing investor-owned utilities (IOUs) to either extend existing Bioenergy Renewable Auction Mechanism (BioRAM) contracts or enter into new ones. BioRAM requires utilities to procure power from biomass plants using wildfire-related waste. Furthermore, AB 706 (2025), which remains pending as of August 2025, is anticipated to further drive demand for biomass power. The Joint State-Federal Biomass Utilization Strategy, issued in April 2025 by CAL FIRE, the California Energy Commission (CEC), and the U.S. Forest Service, is also expected to increase demand for biomass power.

Regarding wood pellets and fuel wood chips for industrial and residential heating, global demand is expanding, resulting in higher production levels. This growing demand affects the feedstock requirements for these facilities, potentially restricting availability for new entrants in the market.

Due to the anticipated surge in demand for competitors' products, this risk indicator is rated as high.

Raw Risk Likelihood (RRL)	**Score**
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)* 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 The Loaded RI Score ((1-Total Notch) X GRI Score) is 18 out of 100.	**Score** **18**

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 Supply 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 supply shortage and/or supplier breach. BAMs of 1.5 or higher are generally signals of lower feedstock risk for new projects in Supply Zones.

Risk Information: A Biomass Availability Multiple (BAM) factor of 3.0 was applied to the available amounts of Pulpwood and Forest Residues, consistent with the primary assumption of a small-scale community bioeconomy. This 3.0 BAM factor accounts for uncertainties in the accuracy of existing inventory data, preparedness for operational scale-up, historical harvesting trends and quantities, and sudden fluctuations in supply and demand. Once the supply chains for the intended local bioeconomy are in place, additional volumes will be available for growth. This cautious multiplier provides ample supply redundancy for new projects within the BDO Zone. The methodology indicates a very low risk for feedstock volume projections, with minimal impact anticipated on the actual supply security for new initiatives.

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	Score
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	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, and 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 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 evaluate the availability of Pulpwood and Forest Residue by delivered price and distance to Grass Valley, comprehensive supply/marginal cost curves were constructed (Figure E-6). The analysis indicates that the specified quantities of Pulpwood and Forest Residues can be obtained from relatively short distances, not exceeding a 50-mile drive. The curves further demonstrate that the designated price ranges could provide access to significant additional volumes during supply disruptions, ensuring valuable redundancy. This supply distribution indicates a very low risk regarding feedstock accessibility within economically viable transport distances, with minimal impact anticipated on supply security during normal 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 supply variations. Seasonal supply variations combined with limitations associated with longer-distance transportation and storage can lead to Supply Zone biomass supply imbalances[13] and can manifest in shortages and higher costs for Issuers.

Risk Information: Logging and fuel reduction operations at higher elevations encounter seasonal restrictions due to snow accumulation, affecting biomass availability during winter months (December to February). This seasonal fluctuation poses challenges for maintaining a consistent year-round supply. Nonetheless, the assessment points out that lower elevation regions remain accessible in winter, providing alternative harvesting areas during these seasonal limitations. This geographic variability suggests a low risk of seasonal supply interruptions, as logging contractors are able to adjust to these seasonal challenges.

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**

3.1.4 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. Feedstock availability is subject to fluctuations caused by wildfire outbreaks. From 2016 to 2021, wildfires damaged approximately 32% of the timberland in the Supply Zone, affecting an estimated 1,515,000 acres. These significant disturbances generate medium risk to consistent year-to-year supply volumes. While fire-damaged stands can provide salvage material in the short term, the unpredictable nature and varied intensity of wildfire events make long-term supply planning more challenging, requiring flexible procurement strategies and diverse supplier relationships.

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**

[13] Golecha & Gan, 2016.

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: Market price data for the US Northwest Region from 2014 to 2025, as documented by Forisk (Figure E-8), reveal fluctuating prices for Pulpwood and Forest Residues, especially in the past five years (note that more accurate, local data was not available, so regional pricing is used as a proxy for general trends). This price variability may pose planning challenges for projects dependent on stable feedstock costs. The observed price fluctuations indicate a low-to-medium risk regarding cost predictability, affecting financial modeling and contract structures for new initiatives in the BDO Zone.

In contrast, the price of wildfire fuel treatment material is expected to remain consistent, driven by operational costs and available funding mechanisms rather than market 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 36 out of 100.	8

3.2.2 Low 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: Considerable long-term expertise exists in providing the designated quantities of Pulpwood and Forest Residues within the BDO Zone. This established demand history indicates robust supply chains with a proven capacity to deliver consistent biomass volumes for similar applications. Furthermore, numerous biomass power and combined heat and power (CHP) plants have been acting as markets for wildfire fuel treatment material. The presence of consistent historical demand patterns reduces uncertainty regarding supplier capabilities and market development requirements. This market maturity implies a very low risk related to supply chain readiness, with minimal impact anticipated on the 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) 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**

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

Rationale: If 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 crop 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) 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**

3.3 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: Notable but temporary spikes in CPI[14] and PPI[15], observed from 2020 to 2022, significantly impacted biomass delivery prices due to disruptions from the pandemic and global supply chain challenges. While economic indicators suggest a gradual return to stability, the recent volatility reveals vulnerability to macroeconomic pressures. Although the CPI and PPI fluctuations during 2020–2022 are considered an exception within the overall trend, they highlight the biomass supply chain's sensitivity to these economic indicators, which affect multiple cost elements such as labor, fuel, equipment, and maintenance expenses. Consequently, the risk related to CPI and PPI fluctuations is deemed medium.

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 supply and operations remain within the domestic U.S. market.

Raw Risk Likelihood (RRL) The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**Score** **NR**
Raw Risk Impact (RRI)	**Score**

[14] U.S. Bureau of Labor Statistics. "Consumer Price Index, West Region – Summary." Accessed January 8, 2024. https://www.bls.gov/regions/west/cpi-summary/ro9xg01a.htm.

[15] U.S. Bureau of Labor Statistics. "Final Demand: 12-Month Percent Change." Accessed January 8, 2024. https://www.bls.gov/charts/producer-price-index/final-demand-12-month-percent-change.htm.

The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is not rated.	**Score** **NR**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. 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 supply and operations remain within the domestic U.S. market

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

3.3.4 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.[16]

Risk Information: Not relevant to this BDO Zone based on the forest biomass types evaluated.

Raw Risk Likelihood (RRL)	**Score**

[16] Bergtold, 2018.

The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**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 *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. 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**

3.4 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 quantities and qualities of Pulpwood and Forest Residue produced from salvage and wildfire fuel treatment reduction activities show variability that could impact the production of high-quality biomass products. This heterogeneity is heightened when feedstocks are sourced from varying altitudes and forest types, posing challenges for achieving uniform quality and effective supply planning. Variations in harvesting practices, processing techniques, and seasonal timing lead to inconsistencies in moisture content, contamination levels, and fiber properties. These operational differences result in a medium risk concerning feedstock quality consistency, affecting processing needs and conversion efficiency. Such variability is often underestimated by project proponents, potentially leading to significant cost increases for implementing robust feedstock quality control and logistics systems.

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	Score
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	36

3.4.2 Harvesting & Collection Equipment

Rationale: Different types of harvesting and collection equipment used by suppliers in a Supply 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 in the Supply Zone employ modern mechanized forestry equipment, including harvesters, skidders, processors, and loaders, supported by high-productivity grinding equipment prevalent across the region. This advanced equipment inventory facilitates efficient harvesting, collection, and processing operations that align with the quality requirements for prospective projects. The presence of appropriate technology and machinery indicates a low likelihood of equipment-related quality issues. Nonetheless, some risk remains due to the nature of material from wildfire fuel treatment processes, which tends to be more contaminated than biomass sourced 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) 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**

3.4.4 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 in the Supply Zone shows an aging demographic with limited influx of younger workers entering the sector. Additionally, a shortage of truck drivers has been noted in the region. While long-term labor availability raises potential concerns, immediate workforce shortages are not expected. This labor market situation indicates a medium risk to long-term supply capacity, with negligible impact anticipated on the initial operations of new projects in the BDO Zone.

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 32 out of 100.	**Score** **32**
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 NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 32 out of 100.	**Score** **32**

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 up to 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 contributes between 20 and 50 percent of the total delivered cost of biomass, with the actual share influenced by feedstock characteristics, transport distances, and regional market factors. As indicated in Figure E-6, the rated supply volumes can be accessed 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)	**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**

3.5.2 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-9 tracks diesel price movements over the past decade, ranging from a low of $2.34 per gallon in January 2016 to a high of $6.87 in May 2022. Since the COVID-19 pandemic, diesel prices have shown signs of stabilization, though past volatility continues to reflect a medium level of transportation cost risk.

Because fuel comprises a substantial share of delivered feedstock costs, projects remain sensitive to diesel price surges, especially during supply chain disruptions. Historical data highlights the likelihood of rapid price increases under strained market conditions. Financial planning that includes contingency reserves, along with strategies such as inventory buffering and flexible supply zone design, can help reduce this exposure.

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**

3.5.3 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, nine 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) 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**

3.5.4 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 Supply Zone suppliers to transport feedstock.

Risk Information: To deliver the rated quantity of Pulpwood and Forest Residue, it is estimated that 19 trucks per day would need deliver feedstock (98,600 bdt/yr / 365 days / 14 bdt/truckload). This results in about one-to-two deliveries per hour. Such delivery frequency in and around Grass Valley, especially given local support for forest biomass utilization, is associated with low risk of community backlash due to increased traffic.

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)	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 Supply 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 limits are enforced throughout the region, particularly in mountainous terrains during wet and snowy periods. Many forest roads lack the design specifications to handle heavy truck traffic, potentially requiring upgrades to accommodate increased biomass transport volumes. These infrastructural and regulatory constraints may limit access during specific seasons or necessitate route changes that increase transportation costs. Such logistical restrictions present a medium risk to planning, affecting 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	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	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: Timberland access supports fuel reduction efforts, but about 40% of the roads feature tight curve radii, constraining the types and sizes of trailers that can operate effectively. Although the removal of short logs remains unaffected, the use of longer trailers or chip vans, typically employed for biomass transport, is significantly restricted in

these areas. These infrastructure limitations present medium risk to efficient biomass recovery, potentially increasing costs or limiting access to certain forest areas. The challenging terrain and limited road development in portions of the Supply Zone create physical barriers to biomass utilization that cannot be easily overcome without significant investment.

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**

3.5.7 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 nine 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)	**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 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: Multiple shared risk factors could concurrently impact various suppliers in the region, such as limited sawlog availability, variable housing starts and lumber prices, and inconsistent funding for salvage and forest restoration activities in public forests. These systemic risks have historically affected the regional forest industry and are expected to continue posing challenges. The supplier base's exposure to these common external factors creates a medium risk to supply chain resilience, as disruptions typically affect multiple suppliers at once rather than independently. This systemic vulnerability diminishes the effectiveness of supplier diversification as a strategy for mitigating risk.

It is noted that the likelihood of funding for fuel fire reduction disappearing is low in the short-term. However, as this risk rating takes a 20-year perspective, the long-term uncertainty with government funding in general deems this risk medium.

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**

3.6.3 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: Approximately 34% of forestland in the Supply Zone is privately owned, with 66% publicly owned. Of the private timberland, one-third is held by timber companies and two-thirds by families, individuals, and tribes. Public lands are subjected to fuel reduction goals and are undergoing biomass extraction. The Good Neighbor Agreement signed between Nevada County and USFS is an example of a cooperation between state and federally managed forests that results in successful forest restoration and biomass (wildfire fuel) extraction efforts. However, some long-term risk associated with funding availability in the long-term exists. Consequently, risk associated with land ownership structures is deemed 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**

3.7 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 (i.e., spring thaws, rainy seasons, or dry seasons – as opposed to from 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 major 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 important in assessing feedstock risk and enable accurate assessment of the efficacy of Issuer's mitigation methods.

Risk Information: Feedstock harvesting is minimally affected by seasonal variations. Snow may limit activities in higher elevations, and wet weather can pose challenges on poorly drained sites. However, these issues are effectively managed by prioritizing the harvest of accessible areas. The ability to adjust operations based on seasonal conditions presents low risk to consistent biomass supply. The region's diverse topography and climate zones provide complementary harvesting windows that support year-round operations with appropriate planning and scheduling.

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 Supply 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.[17] 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**

[17] Sierra Business Council, The Forest Management Opportunity Final Report (2022)

The risk likelihood is deemed high, therefore the RRL is 8 out of 10.	**8**
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 48 out of 100.	**Score** **48**
Mitigation/Notching *RRL Mitigation (Notch)* The overarching assumption of a community bioeconomy located in Grass Valley 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 24 out of 100.	**Score** **24**

3.7.3 Forest Fire

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

Risk Information: CAL FIRE identifies the Supply Zone as having a high wildfire risk.[18] Within the areas designated for biomass sourcing, Fire Hazard Severity Zones are categorized as moderate, high, or very high. The elevated probability and potential severity of wildfire events presents high risk to forest resources and biomass supply continuity. While fire-damaged stands can provide salvage material in the short term, catastrophic fires can remove large areas from production for extended periods, creating significant supply disruptions and potentially altering long-term forest composition and productivity.

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 overarching assumption of a community bioeconomy located in Grass Valley 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**

[18] "Fire Hazard Severity Zones." Accessed January 8, 2024. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones.

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 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: Prolonged drought and wildfire activity have heightened the threat of bark and wood-boring beetles in California forests. These insects infect and weaken trees, often resulting in extensive damage or mortality. The impact of such infestations poses a risk to the rated biomass quantity. The increasing prevalence and severity of forest pest outbreaks presents medium to high risk to timber resources and biomass availability. While infested stands can provide salvage opportunities in the short term, widespread mortality can substantially reduce forest productivity over longer timeframes, potentially creating future supply constraints.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**24**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) 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**

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.	**NN**

RRI Mitigation (Notch) 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 not rated.	**Score** **NR**

3.7.6 Risk of Flood

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

Risk Information: The BDO Zone's center point is located in a region with minimal exposure to flood risk. The overall flood risk for the Supply Zone is assessed as low based on Federal Emergency Management Agency data. 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) 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 very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **8**
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** **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: Drought conditions are a recurring challenge in the Supply Zone, with abnormally dry years recorded in seven of the past decade. This persistent dryness heightens the risk of infestations and wildfire occurrences.[19] The frequency and intensity of drought periods present medium risk to forest health and productivity. Extended drought

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

stress reduces tree growth, increases mortality, and creates favorable conditions for pest outbreaks and catastrophic wildfire, all of which can impact biomass availability and quality over both short and long timeframes.

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 overarching assumption of a community bioeconomy located in Grass Valley 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%.	**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 availability of live-bottom trailers in the North and South-East of the US for several months as truckers shifted operations to handle more lucrative government contracts. Although scientists are uncertain whether climate change will lead to an increase in the number of hurricanes, warmer ocean temperatures and higher sea levels are expected to intensify their impacts. Recent analyses conclude that the strongest hurricanes occurring in some Supply Zones, including the North Atlantic, have increased in intensity over the past two to three decades.

Risk Information: With a Minimal Wind Factor, the Supply Zone faces a low risk of hurricane, tornado, or severe storm wind impacts. The absence of historical impacts from severe wind events presents low risk from this particular natural hazard. The regional climate patterns do not typically include the conditions necessary for hurricane-force winds or frequent tornadoes, allowing forest operations to proceed with minimal risk of wind-related disruptions.[20]

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.	**NN**

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

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**

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 frequently fall below 40 degrees Fahrenheit, sometimes leading to brief operational delays due to equipment maintenance needs. Nonetheless, local suppliers possess significant experience in managing cold weather conditions and have implemented effective mitigation measures, such as adjusted maintenance schedules, cold-weather lubricants, and specialized operational protocols. The predictable and controllable nature of these cold weather impacts indicates a low risk to the overall biomass supply, although it may influence 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)* **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**

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.[21] In addition BioRAM funding provides subsidies to existing biomass plants, introducing investment risk for biomass supply chains.[22] This situation is further complicated by existing biomass power plants under

[21] nationalaglawcenter.org/wp-content/uploads/assets/crs/R43872.pdf
[22] Forest Management Opportunity Report, 2022

BioRAM contracts (e.g., Rio Bravo Rocklin, SPI Lincoln) that already absorb substantial available feedstock, leaving low margins for new projects.[23] 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 Grass Valley. 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) 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**

3.8.2 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 that 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)	**50%**

[23] TCSI Capacity Report, 2024

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%.

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 SUPPLY ZONE Zone can directly impact Issuer's ability to procure, transport, trans-load, store, or utilize feedstock by affecting local policies, regulations, and Issuer's ability to obtain necessary permitting.

Risk Information: In Nevada County, the prevalent public opinion on biomass removal from forests—encompassing both traditional forestry byproducts (Forest Residues, Pulpwood Harvest) and wildfire fuels from treatment programs (Pulpwood Thinning and Salvage)—leans towards support, particularly when framed as a strategy for wildfire risk reduction and forest health enhancement. County-led initiatives, such as the Biomass Pilot Project launched in 2025, reflect community backing for utilizing excess woody biomass to mitigate wildfire risks, reduce air pollution through biochar production, and support forest restoration. Projects like the Truckee Ranger District Roadside Hazardous Fuel Reduction, facilitated by the Good Neighbor Agreement with the U.S. Forest Service, have progressed with local government and stakeholder support, indicating broad acceptance for biomass utilization to improve air quality, protect watersheds, and create economic opportunities. However, some opposition exists, primarily from environmental groups concerned that biomass extraction could harm biodiversity, soil health, and carbon sequestration, viewing it as a potential contributor to forest degradation rather than a true wildfire mitigation solution. Overall, support appears dominant in local policy and community wildfire plans, driven by the county's high wildfire vulnerability.

Public opinion has shifted towards stronger support for biomass removal following major 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 accumulation from decades of fire suppression. These events emphasized the dangers of unmanaged forests, leading to greater 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 Nevada County, this is evident in projects like the Good Neighbor Agreement with the Tahoe National Forest and the Biomass Pilot Project, where community engagement has grown, viewing biomass removal as preferable to uncontrolled burns. Opposition persists among some environmentalists, who argue that post-fire logging can impede natural recovery and biodiversity, but the post-2018 fire shift has leaned 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) The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**Score** **24**
Mitigation/Notching *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%.	**Notch** **50%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 12 out of 100.	**Score** **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: Under California's AB 52,[24] public agencies are obligated to consult with Native American tribes culturally and traditionally connected to the area of a proposed project during the CEQA process. This consultation focuses on potential impacts to tribal cultural resources within the tribe's traditional territory. The requirement is initiated only if the tribe actively requests notification and consultation/ This regulatory framework creates medium risk that requires proactive engagement with tribal entities to mitigate. 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.

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	**Score** **18**

[24] 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/.

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.

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

3.9 Risk Factor: Sustainability and Environmental Concern

3.9.1 Feedstock Sustainability

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

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

Risk Information: In California, the commercial harvesting of trees requires a Timber Harvest Plan (THP) prepared by a Registered Professional Forester. This plan, reviewed and approved by state agencies, functions as the equivalent of an Environmental Impact Report. It addresses key elements of forest health, including soil and water conservation, fire management, wildlife and fish protection, Native American concerns, forestry practices, and public resource impacts.[25]

Sierra Pacific Industries, the largest private landowner in the region, has its timberlands certified under the Sustainable Forestry Initiative (SFI)[26] and actively promotes this certification to other private landowners.[27] Public timberlands, by contrast, are not certified for sustainability. Instead, harvest activities on public lands are subject to an approval process

[25] Timber Harvest Plans in California. www.wildcalifornia.org/_files/ugd/64096f_b2aa0aa2387547ce9bfee9b032282b5a.pdf?index=true. Accessed Jan 8, 2024.
[26] Sierra Pacific Industries. Personal Communication.
[27] Sierra Pacific Industries. Sustainability. https://www.spi-ind.com/OurForests/SustainableForestInitiative. Accessed Jan 8, 2025.

under the National Environmental Policy Act (NEPA)[28], overseen by the U.S. Environmental Protection Agency These regulatory frameworks present low risk for sustainability concerns.

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.

Risk Information: Soil quality is safeguarded by adherence to SFI standards and NEPA requirements, both of which include detailed guidelines for protecting soils during forest harvesting. These guidelines limit equipment use in wet conditions, require water bars on skid trails, and restrict operations in sensitive areas. Collectively, these practices reduce the risk of soil degradation during biomass recovery activities. Oversight is maintained through the permitting process and certification audits, ensuring that compliance measures are properly implemented and monitored.

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**

[28] National Environmental Policy Act. https://www.epa.gov/nepa. Accessed Jan 8, 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 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: Surface and groundwater quality is supported by logging practices that follow NEPA requirements and SFI standards. These frameworks incorporate protections such as designated streamside management zones, construction guidelines to reduce erosion, and operational restrictions near water bodies. Together, these measures help manage water resources effectively and reduce the likelihood of impacts from biomass recovery. Ongoing oversight through permitting and certification audits ensures that best practices are followed and implementation is verified.
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 16 out of 100. **16**

3.9.4 Water Use

Rationale: Biomass feedstock operations can have significant impacts on the hydrological flux (infiltration, groundwater recharge, interception, and transpiration) of ecosystems. This can lead to water shortages, lower yields, and backlash from regulatory bodies if management plans are not properly instituted.
Risk Information: Compliance with SFI standards and NEPA regulations ensures that logging operations incorporate measures for conserving water and protecting water resources. Forest-based biomass production differs from irrigated agriculture in that it relies on rainfall, not supplemental water inputs. As a result, overall water use remains low, contributing to a reduced risk of negative effects on water availability or quality.
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 The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.9.5 Pesticide Risk to Human and Ecosystem Health

Rationale: Application of pesticides (i.e., herbicides, fungicides, and insecticides) on agricultural and forest landscapes can result in adverse health effects for humans and ecosystems. If pesticide application is required in feedstock production, the impact must be considered in the BDO Zone rating.

Risk Information: While pesticides are widely applied in agriculture to control insects, particularly in fruit and nut production, their use in timber operations is minimal. The USDA Forest Service's Forest Health Protection staff oversees pesticide application in forested areas. On National Forest lands in California, the area treated with pesticides each year is very small, amounting to roughly one-tenth of one percent of the total forest and rangeland area.[29] This limited application presents very low risk to human and ecosystem health.

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**

3.9.6 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: The risk to wildlife and landscape from biomass production and supply operations is very low, as these activities are conducted in accordance with NEPA regulations and SFI standards. These guidelines include habitat protection measures such as preserving snags and down wood, maintaining varied stand structures, and implementing

[29] USDA Forest Service. Pesticide-Use Management & Coordination. https://www.fs.usda.gov/detail/r5/forest-grasslandhealth/?cid=fsbdev3_046692#:~:text=The%20land%20area%20treated%20with,National%20Forest%20lands%20in%20California. Accessed Jan 8, 2025.

management zones near sensitive areas. Timber Harvest Plans incorporate biological assessments and mitigation actions to manage potential impacts on wildlife. Through these regulatory and operational safeguards, biomass recovery efforts are effectively integrated with habitat conservation priorities. 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.

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 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 features a well-developed and organized system for the production, harvesting, transportation, and processing of sawmill residues, along with the chipping of Pulpwood Harvest and Forest Residues. These biomass resources are of adequate quality for most biobased projects and have a long history of use by biomass power facilities within the Competition Zone. This established quality track record presents low risk for feedstock quality concerns.

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)	**NN**

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

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 21-acre site on La Barr Meadows Road in Grass Valley, CA, is zoned for industrial use and located within a mile of downtown Grass Valley. Although municipal utilities are planned, some connections remain incomplete. The site is evenly divided between wooded and cleared areas, with portions featuring asphalt pads. Nevada County, including this site, lies within an Opportunity Zone, offering potential tax advantages for qualifying businesses. [30]

The County recently approved a woody biomass operation on five acres of the site, which will host carbonizers for wood waste disposal. This existing approval may simplify permitting for industries that align with or complement the planned biomass activities. Both the City of Grass Valley and Nevada County are known for their pro-business stance, further supporting industrial development.

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**

5.1.2 Ownership of Land

Risk Information: The La Barr Meadows site is owned by Nevada County. This public ownership provides stability for potential project development while offering streamlined negotiation processes for land acquisition or lease agreements. The municipal ownership presents low risk for site control and transfer.

[30] California Department of Finance. "California Opportunity Zones." Accessed December 4, 2024. https://dof.ca.gov/forecasting/demographics/california-opportunity-zones/.

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**

5.1.3 Permitting Description

Risk Information: Development of a community-scale biomass project in Nevada 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 Northern Sierra Air Quality Management District (NSAQMD), the California Energy Commission (CEC), and Nevada County's Community Development Agency.

Key regulatory and permitting requirement include: Environmental Impact Assessment (CEQA), air quality permits (NSAQMD), land use and zoning permits, waste management and water permits, safety and labor compliance, and construction permits. fs

California's regulations, including Nevada County's, remain more stringent than many U.S. jurisdictions. For this reason this risk indicator is deemed medium.

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**

5.1.4 Environmental Issues

Risk Information: The rural location of the site, combined with its proximity to forested areas and water sources, introduces several environmental risks that may affect operational costs and regulatory compliance.

The site's location near dense vegetation heightens its vulnerability to wildfires, particularly during California's dry season. In recent years, both the frequency and severity of wildfires have increased, posing significant risks to operations and property. To address wildfire risks, California utility providers implement Public Safety Power Shutoffs (PSPS) during periods of elevated fire danger, which may disrupt operations.

Additionally, Nevada County is situated in a seismically active region, though it is not directly located on major fault lines. Industrial facilities must therefore comply with strict earthquake-resistant building codes to mitigate potential risks. These environmental considerations present medium risk to project development and 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 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) is the primary natural gas supplier in Nevada County. The adjacent parcel on La Barr Meadows Road is served by a four- to six-inch pipeline, requiring only metering and on-site piping for new tenants.

As of July 2024, industrial natural gas rates averaged $9.87 per MCF,[31] the fourth highest in the US. These elevated rates stem from regulatory fees, extensive infrastructure safety upgrades, and California's renewable energy mandates. Seasonal demand and the state's reliance on imported natural gas further contribute to higher prices during peak periods. These factors present medium risk for operational cost stability.

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**

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

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

5.2.2 Electric Availability

Risk Information: In Nevada County, Pacific Gas & Electric (PG&E) charges 42 cents per kilowatt-hour (kWh) for electricity, which is significantly above the California state average and more than twice the national average of 19 cents per kWh.[32] This high cost, driven largely by infrastructure maintenance expenses, represents a medium to high risk for new industrial operations. While a 25kV PG&E transmission line is located along the eastern edge of the site, it is not connected to the property. Establishing service will require the installation of a small substation (transformer) and extending 12.5kV lines approximately 100 yards to reach the site. The nearest existing substation is more than a mile to the north. PG&E maintains a strong reliability record across central and northern California, providing consistent service despite the challenges of rugged terrain and wildfire risks. However, periodic wildfire-related power shutoffs during peak fire seasons may disrupt operations. These infrastructure limitations and cost factors indicate a high risk to operational efficiency and economics.

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

5.2.3 Water Availability

Risk Information: Water services in Grass Valley are overseen by the City's municipal authority. The La Barr Meadows site, situated at the City's southernmost boundary, has an existing water connection through a 12-inch main supplying under 1,000,000 gallons per day. This established connection presents low risk for water supply.

[32] EnergySage. "Electricity Cost in Nevada County, CA: 2024 Electric Rates." Last modified October 6, 2024. https://www.energysage.com/local-data/electricity-cost/ca/nevada-county/.

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**

5.2.4 Waste Disposal

Risk Information: The southern portion of Grass Valley lacks sewer lines and waste treatment facilities. Industries considering the La Barr Meadows Road site may need to construct a septic system, depending on employee numbers and wastewater output. Solid waste can be disposed of at one of two Waste Management sites near Grass Valley, both serving residential and commercial needs daily. Hazardous material disposal requires obtaining a prior permit. These limitations present medium risk for waste management operations.

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) 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**

5.2.5 Internet Availability

Risk Information: Grass Valley is serviced by AT&T and Xfinity, which offer high-speed internet with speeds up to 5G for commercial and industrial users. In addition, smaller providers are available, offering connectivity choices.

Although most of the region has access to reliable high-speed internet, certain rural areas may face connectivity challenges, potentially impacting operations that rely on uninterrupted broadband service. The overall telecommunications infrastructure indicates low risk to business operations.

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**

5.3 Risk Factor: Transportation/Logistics

5.3.1 Road/Highway Access

Risk Information: The La Barr Meadows Road site offers adequate road and highway access for freight transport. State Highway 49, the main north-south route, is less than a mile away, while Interstate 80 is within 15 miles to the south. Area roads are generally well-maintained and kept clear during winter. This transportation infrastructure presents low risk for logistics operations.

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**

5.3.2 Rail Access

Risk Information: The site lacks direct rail access, but Union Pacific Railroad (UPRR) and Amtrak services are available 15 miles south in Colfax, CA. Intermodal carriers in the area offer transport services connecting the industrial site to UPRR terminals, providing logistics solutions for freight movement.

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.

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)* 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**

5.3.3 Airport Access

Risk Information: Nevada County Airport is four miles east of Grass Valley and features a 4,600-foot asphalt runway providing general aviation services. Sacramento International Airport, 64 miles from Grass Valley, offers extensive passenger and freight services through 13 major airlines and seven air freight companies, serving as a significant West Coast hub. This air transportation infrastructure presents very low risk for business 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 16 out of 100.	**16**

5.3.4 Water Freight Access

Risk Information: Situated 62 miles from the center point, the Port of Sacramento offers water freight access to the Pacific Ocean via the Sacramento River. The navigability of the Sacramento River and its deepwater channel ensures dependable year-round transport, making it a consistent and versatile shipping option. The distance to these facilities creates low risk for operations requiring water freight access.

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 Risk Factor: Social Infrastructure

5.4.1 Healthcare (Local)

Risk Information: Sierra Nevada Memorial Hospital in Grass Valley is a 104-bed acute care facility offering surgery, oncology, emergency care, and other medical services. The Grass Valley area also provides a wide range of healthcare options, including urgent care centers, senior assisted living facilities, and specialty clinics.

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**

5.4.2 Education (Schools)

Risk Information: Green Valley School District operates 15 public schools, serving 640 students and ranking within the top 50% of California K-12 districts.[33] The area also features 11 charter schools and several specialty academies. Grass Valley is home to the Nevada County Campus of Sierra College, offering Associate Degree and Certificate programs, including vocational training in forestry and agriculture.

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**

5.4.3 Local Transportation

Risk Information: Grass Valley features a local bus system that serves the city and nearby suburbs. Amtrak service is accessible from Colfax, 15 miles away, with connections to Sacramento and San Francisco. Additional transportation options include taxi services, ridesharing through Uber, medical transportation, and private or rental car access.

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**

[33] Niche. "2025 Best School Districts in Nevada County." Accessed December 4, 2024. https://www.niche.com/k12/search/best-school-districts/c/nevada-county-ca/.

5.4.4 Public Safety (Local)

Risk Information: The La Barr Meadows Drive site is served by the Grass Valley Police Department and the Nevada County Sheriff's Department. Grass Valley has a violent crime rate of 540 per 100,000, and a property crime rate of 2,146 per 100,000[34]. Grass Valley's rate (540 per 100,000) is ~25% higher than the national average (431 per 100,000). Grass Valley's property crime rate (2,146 per 100,000) is just 1% higher than the national average (2,128 per 100,000).

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) 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 48 out of 100.	**48**

5.4.5 Housing/Cost of Living

Risk Information: Nevada County, California, has a cost-of-living index of 138.2, indicating total living expenses are 38.2% above the national average and 7.8% higher than the California average.[35] Housing significantly contributes to these elevated costs, with the median home price in Grass Valley at $568,000 and a median price per square foot of $327, approximately 97% higher than the national average. Rental costs are also high, with average apartment rents of $1,847 per month.[36]

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] Sperling's BestPlaces. "Nevada County, CA Cost of Living." Accessed December 3, 2024. https://www.bestplaces.net/cost_of_living/county/california/nevada.
[36] Sperling's BestPlaces. "Nevada County, CA Housing." Accessed December 3, 2024. https://www.bestplaces.net/housing/county/california/nevada.

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: Nevada County's unemployment rate, as of 2024, is 4.2%,[37] slightly below the national average, reflecting a stable economy and a moderately competitive labor market for local recruitment. With over 47,000 employed residents, 28% of whom possess high school diplomas and some college education,[38] the county offers a favorable labor pool. Proximity to Sacramento and population growth further enhance the talent base, attracting individuals seeking employment opportunities, quality of life, and accessible amenities.

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 Nevada County, labor costs are moderately high compared to many regions in the United States. The average annual salary is $49,855, or $23 per hour, while the minimum wage stands at $16 per hour.[39] This rate is significantly higher than the federal minimum of $7.25 and aligns with California's statewide minimum for most employers as of 2024.

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

[37] YCharts. "Nevada County, CA Unemployment Rate." Accessed December 3, 2024. https://ycharts.com/indicators/nevada_county_ca_unemployment_rate.
[38] www.ncen.org/images/documents/lmi/regional-profiles/2019/Nevada%20County%20Report.pdf
[39] Employment Development Department. "Labor Market Information Division - Home Page." Accessed December 3, 2024. https://labormarketinfo.edd.ca.gov/.

No adjustment.

RRI Mitigation (Notch)
No adjustment.

The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).

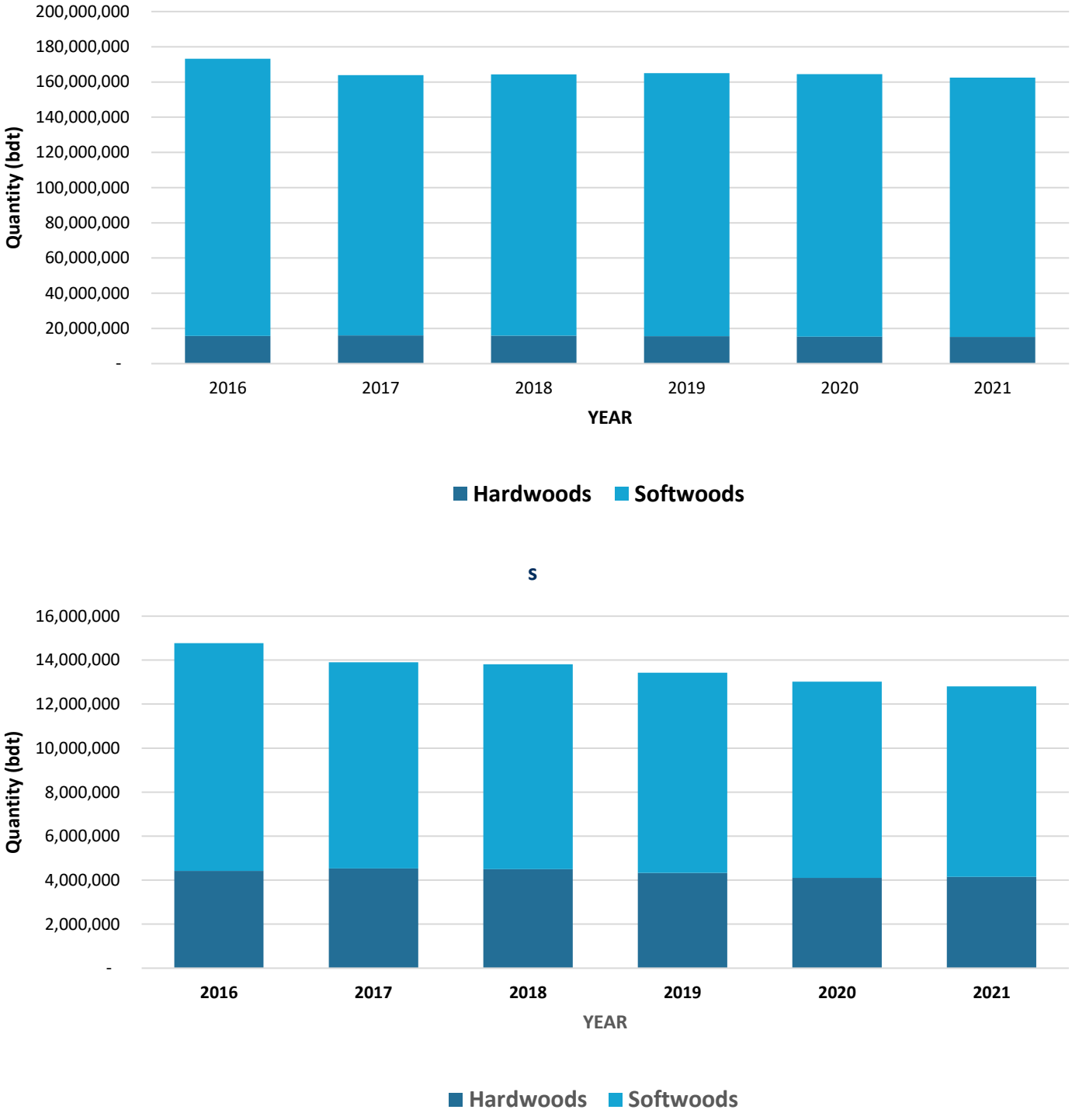
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

SECTION E: TABLES AND FIGURES

Table E-1. Counties in Supply Zone with Percent Overlap

County	Percent in Supply Zone
Sutter	100
Yuba	100
Nevada	97
Sierra	75
Placer	71
Sacramento	69
Butte	65
El Dorado	47
Colusa	44
Yolo	39
Amador	27
Plumas	9
Glenn	6
Solano	2
Washoe	<1%

Figure E-1. Merchantable Biomass of All Live Trees in the Supply Zone (2016-2021)[40]



[40] 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

Figure E-3. Percent Merchantable Biomass of Standing Live Trees by Ownership[41]

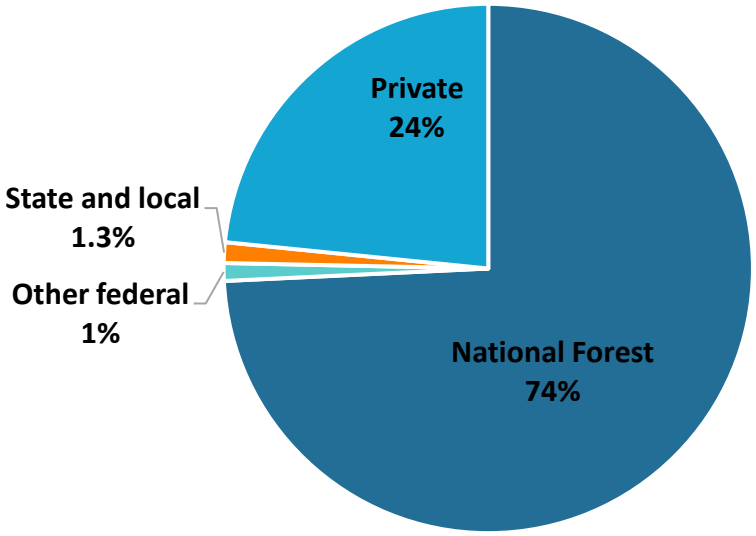
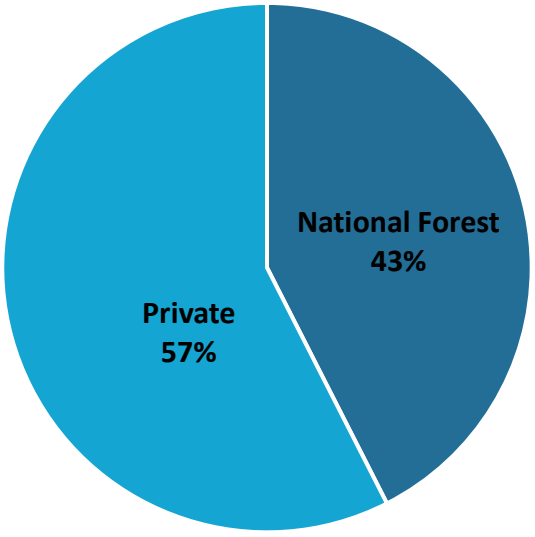
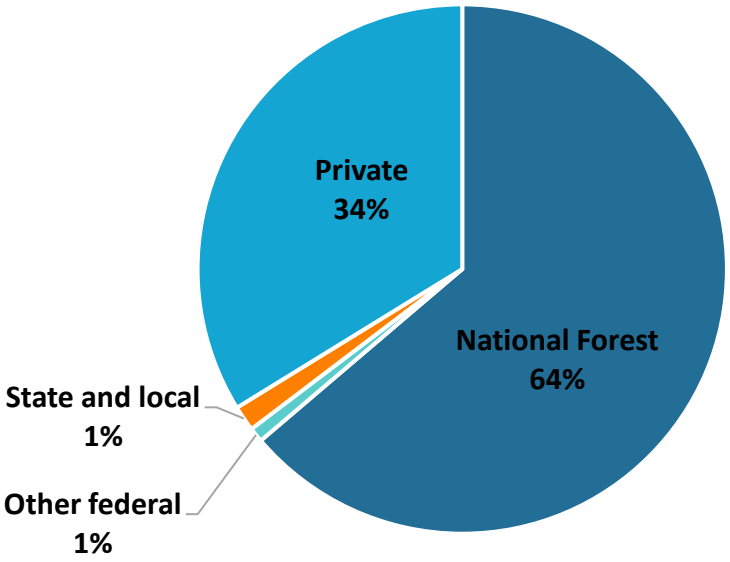


Figure E-4. Percent Timber Removal by Ownership[42]



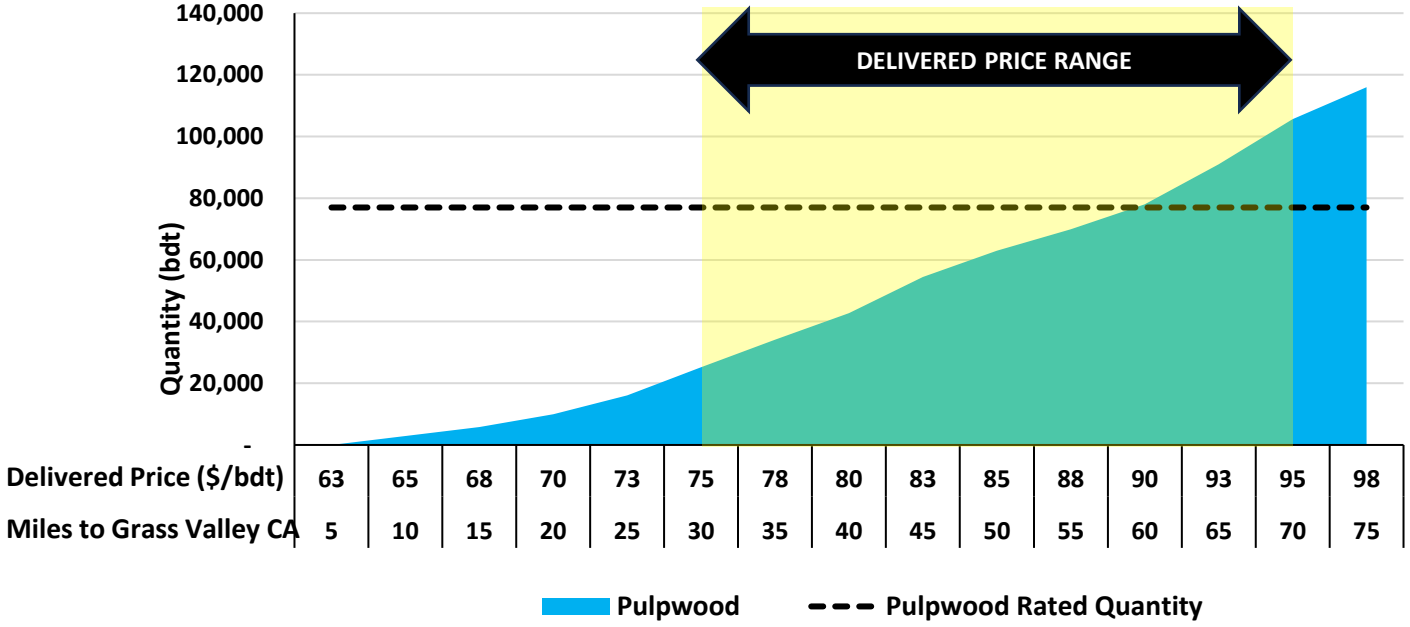
[41] Ibid.
[42] Ibid.

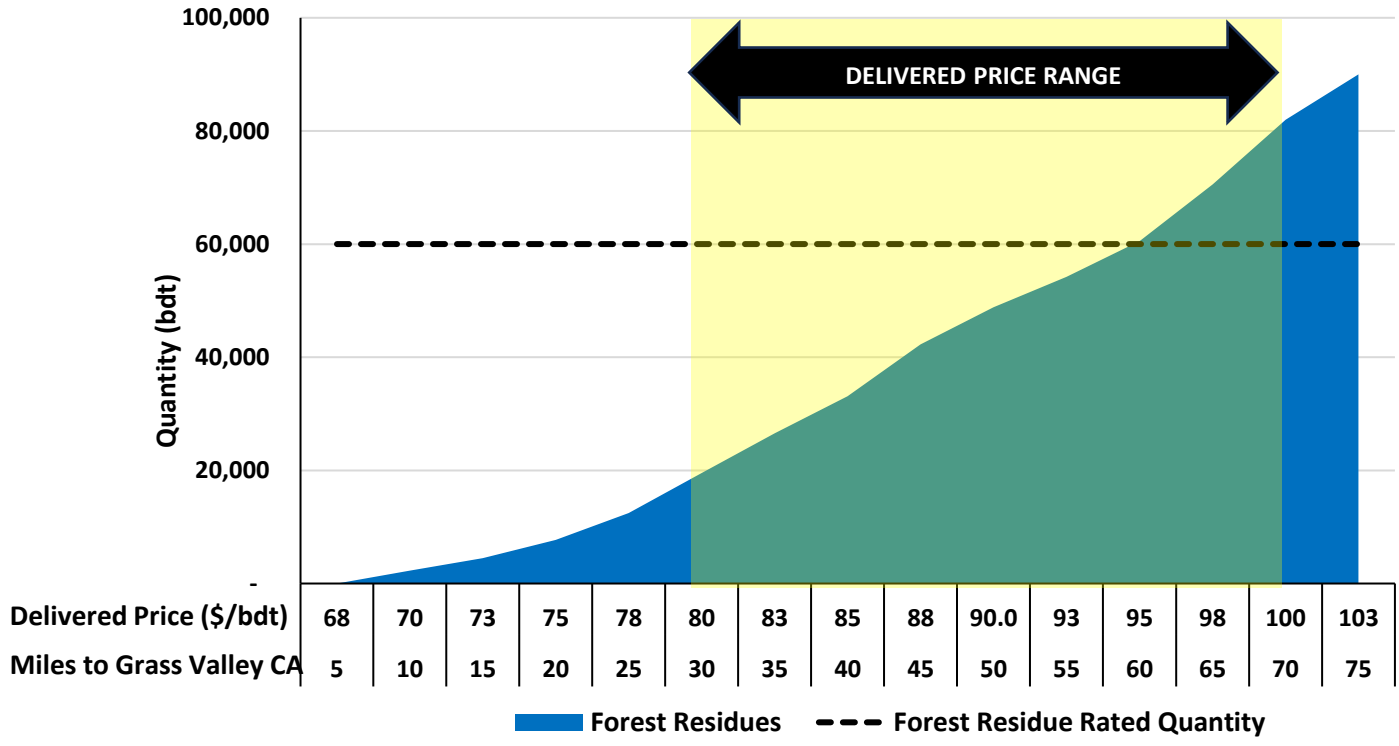
Figure E-5. Percent Timberland Area by Ownership [43]



[43] Ibid.

Figure E-6. Supply/Marginal Cost Curves for Pulpwood and Forest Residues Generated in the Supply Zone[44]





[44] 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 Grass Valley, CA

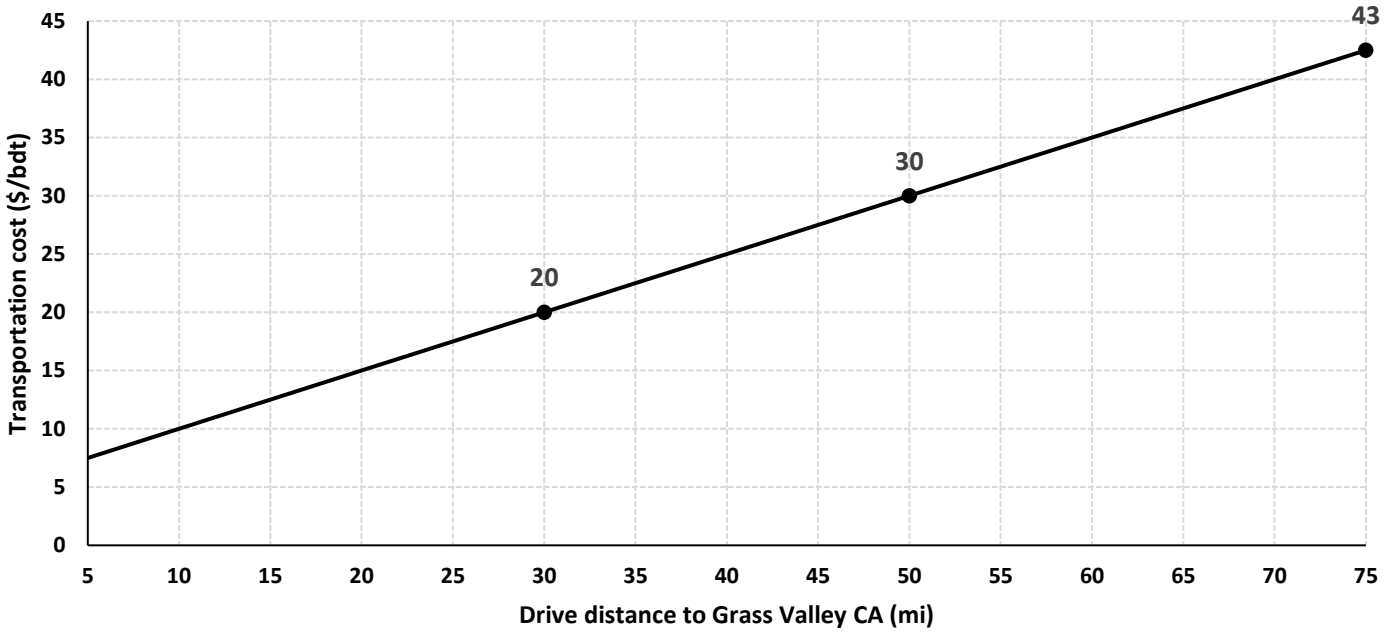


Figure E-8. Pulpwood and Forest Residue Market Prices (Forisk 2024-25 Reports, Pacific Northwest)

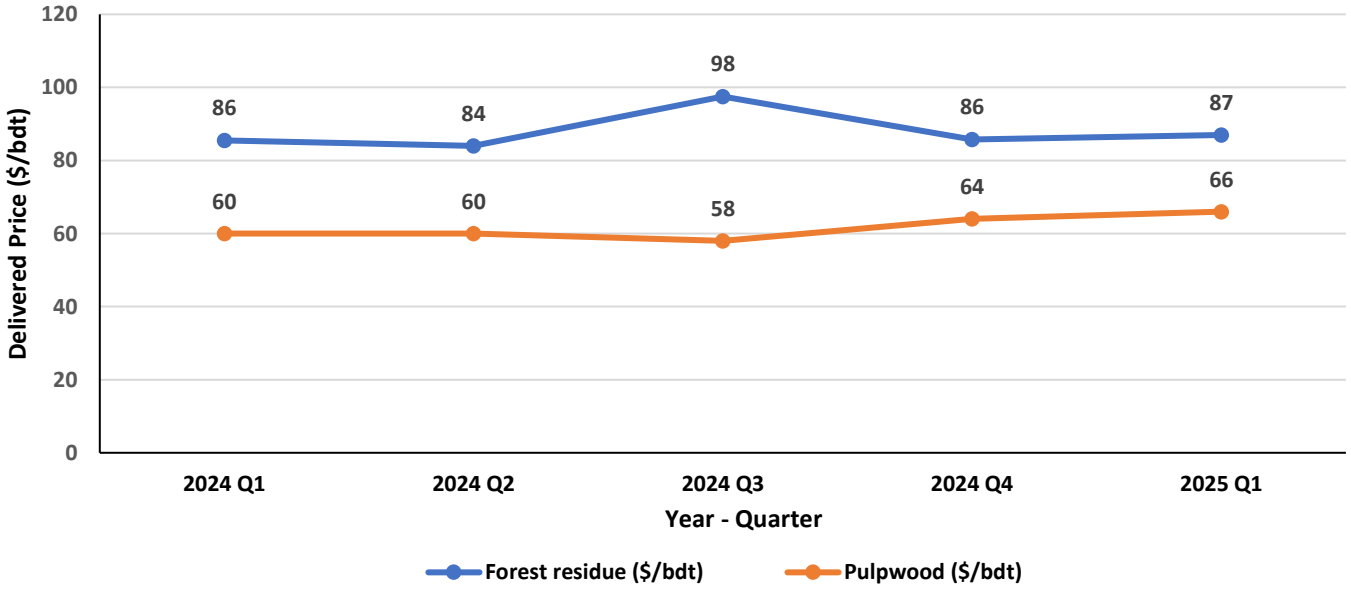


Figure E-9. Monthly No 2 Diesel Retail Price – California[45] vs US National Average[46]

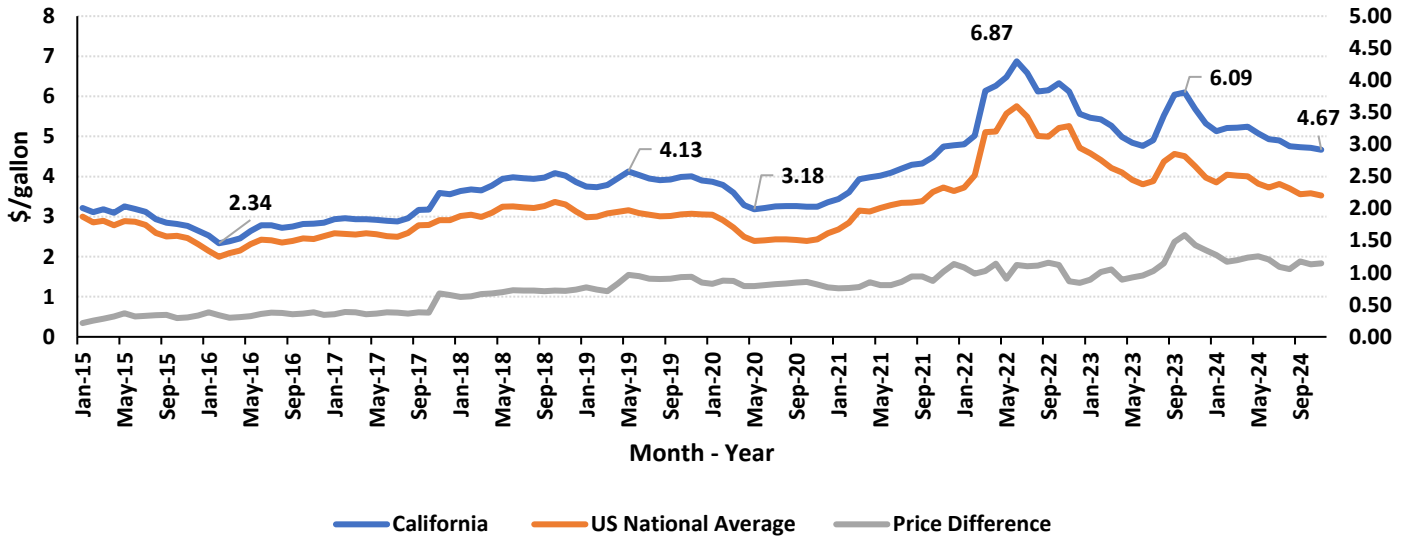
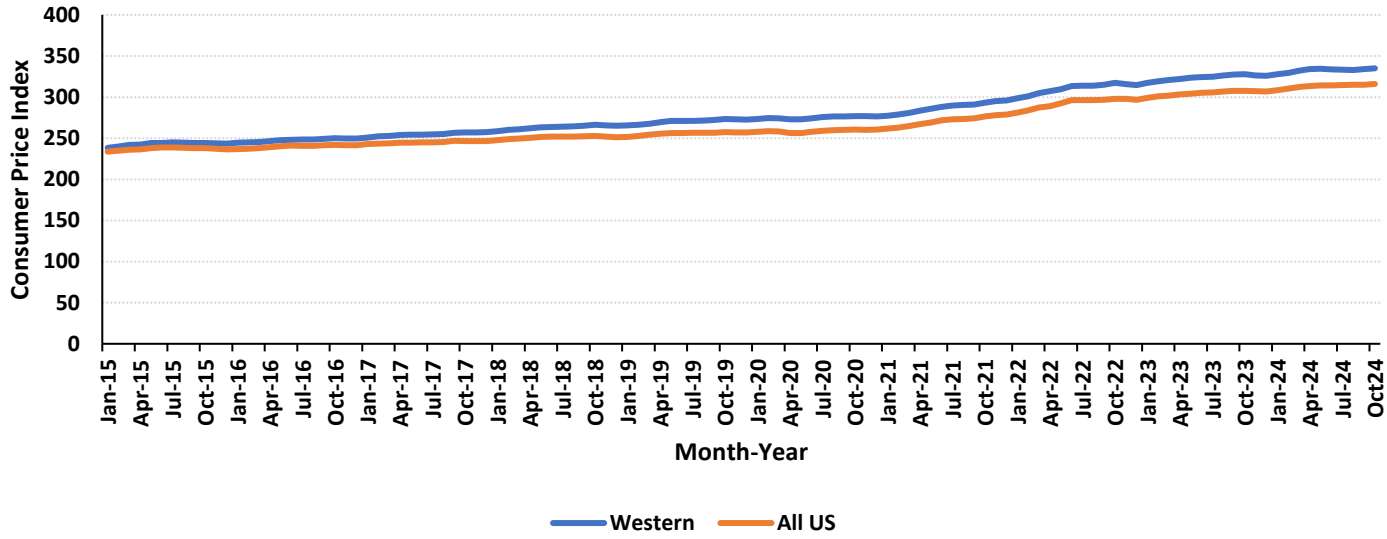


Figure E-10. Consumer Price Index – US West Region vs US National Average[47]

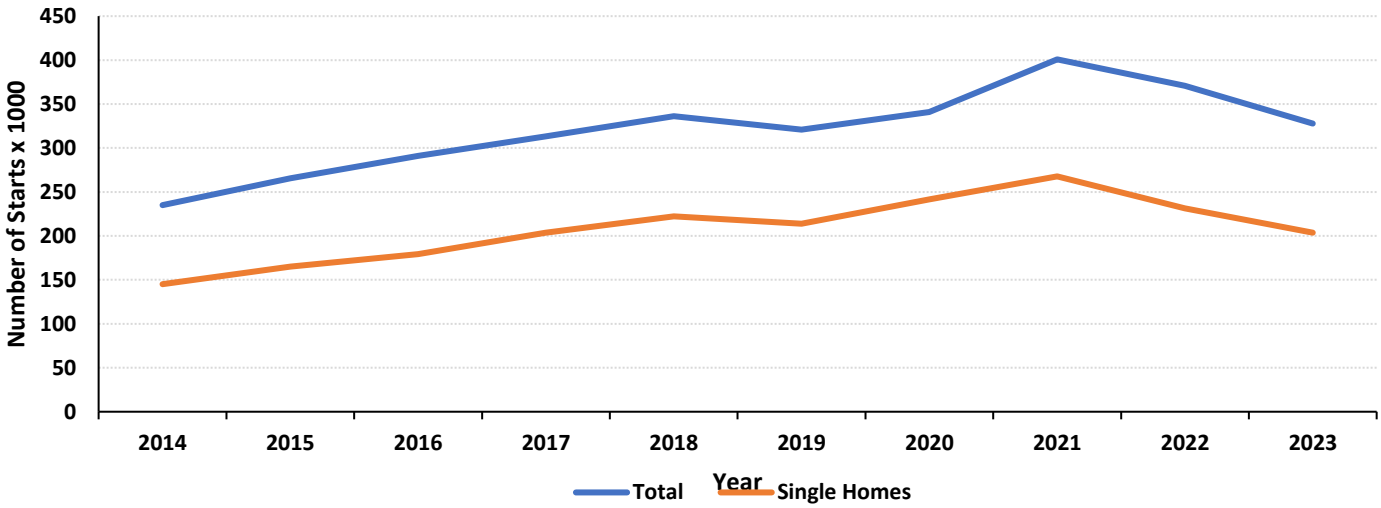


[45] U.S. Energy Information Administration. "California No. 2 Diesel Ultra Low Sulfur (0-15 ppm) Retail Prices." Accessed November 26, 2024. https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXL0_PTE_SCA_DPG&f=M.

[46] 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.

[47] 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[48]



Map E-1. Location of Nevada County, CA



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

Map E-2 Location of Grass Valley, CA

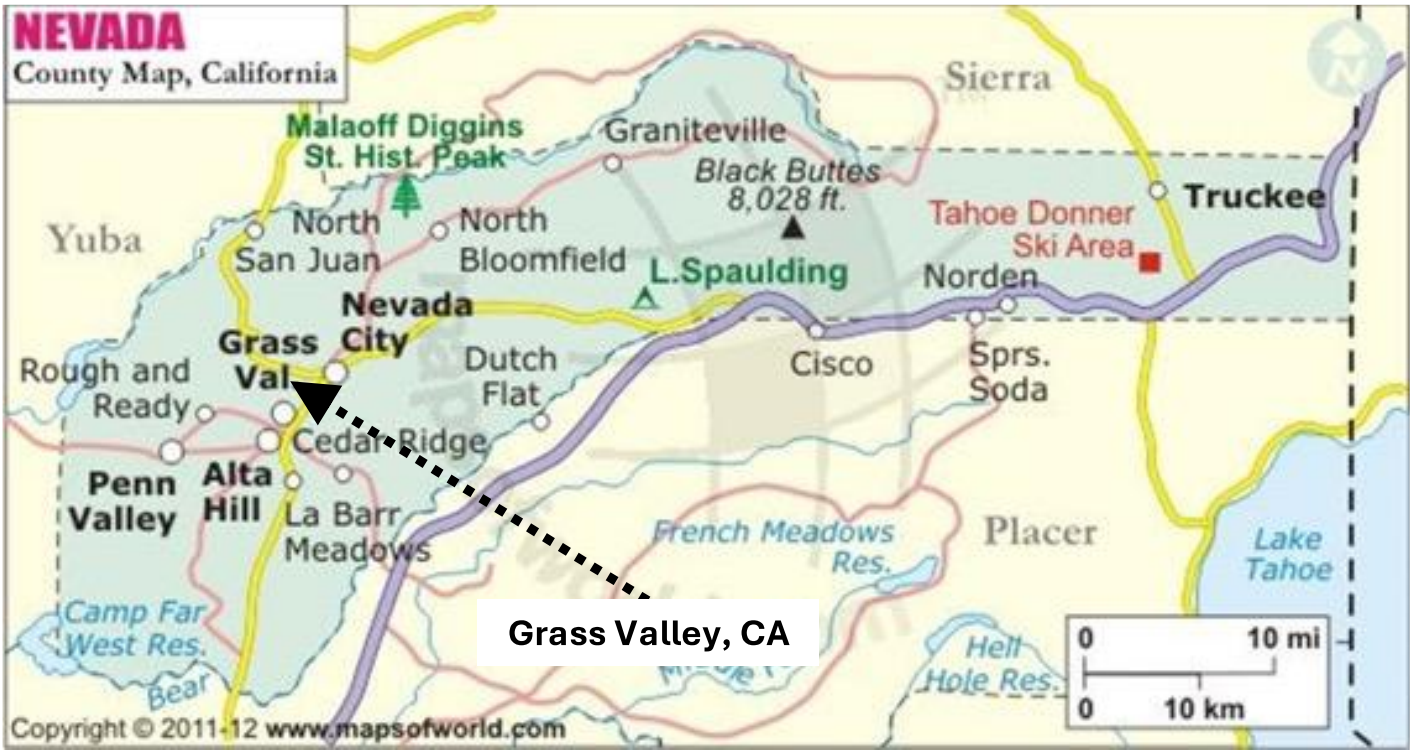


Figure E-12. Aerial Photo of Industrial Site



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