SAN JUAN COUNTY, UT

Biofuel Development Opportunity Zone

RATING GRADE: 'BB'

Date of Issue: November 25, 2024

BB
Speculative

Rating Parameters:

Category	Rated Quantity	Delivered Price	BDO Zone Size
Pulpwood	**6,500 bdt/yr**	**$80-$100/bdt**	**75-mi drive distance**
Forest residue	**3,500 bdt/yr**	**$60-$70/bdt**	**from Monticello, UT**

BDO ZONE ASSETS

- Sufficient logging capacity to ensure recovery of the rated quantities.
- Regional forest residue supply experience.
- Limited current competition for roundwood and forest residue sourced from the Manti-La Sal National Forest in Utah.
- Three project development sites ranging in size from 3 to 20 acres with streamlined permitting and access to inexpensive utilities.

BDO ZONE LIABILITIES

- Significant wood supply uncertainty from the Manti-La Sal National Forest.
- Limited forested area is susceptible to wildfire and insect infestation over the long term.
- Possible future competition for roundwood supplies with two large wood processing facilities in Colorado.
- Bio-projects located in San Juan County, UT, would have to source feedstock from distances of over 65 miles, increasing susceptibility to transportation cost volatility.

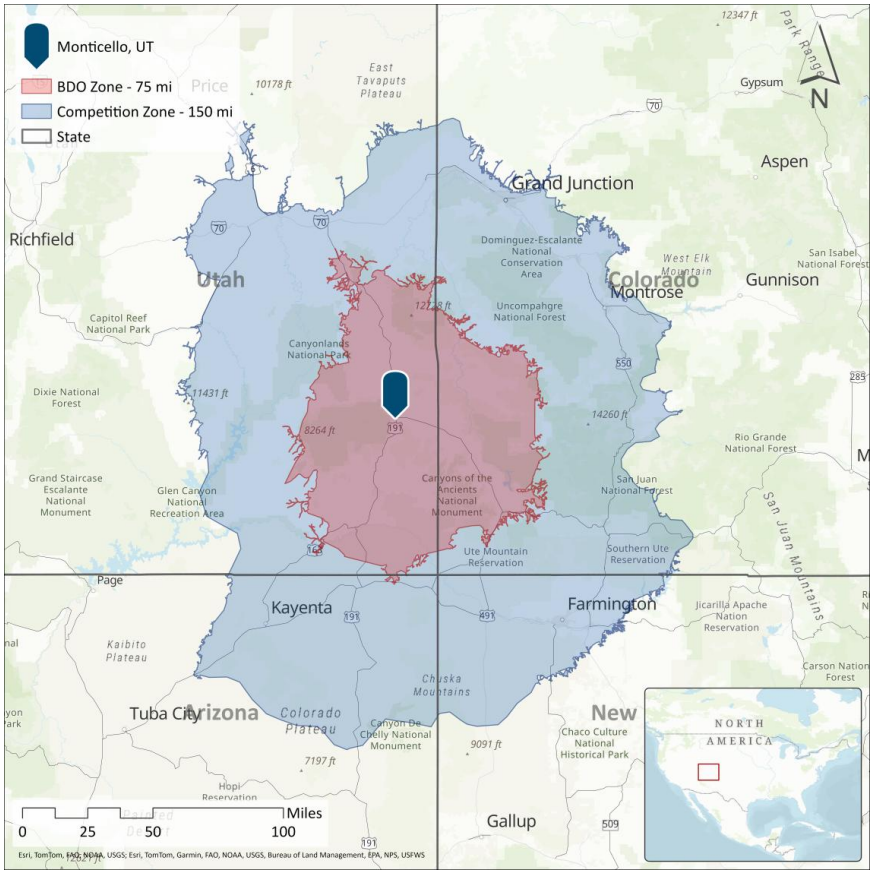
RATING GRADE

The San Juan County, UT Biofuel Development Opportunity Zone, is rated 'BB', or 'moderate' 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).

'BB' ratings indicate moderate prospects for Feedstock Supply and Infrastructure (FS&I) with an elevated vulnerability to risk over time, particularly in the event of adverse business or economic conditions. Accessing the full rated quantity of wood fiber will require that project proponents engage with the United States Forest Service to arrange for a resumption of timber sales from the southern portion of the Manti-La Sal National Forest.

SAN JUAN COUNTY, UT BDO ZONE



ANALYST NOTES

A total of 10,000 bdt/yr of wood fiber is estimated to be available for new projects in the BDO Zone at moderate risk. This includes 6,500 bdt/yr of roundwood (pulpwood) and 3,500 bdt/yr of forest residue. The average delivered price is expected to range from $80 to $100/bdt for pulpwood and $60-$70/bdt for forest residue. Sawmill residues are unlikely to be available for new projects, and the largest owner of pinyon-juniper woodlands (the Bureau of Land Management) is not currently interested in supporting commercial harvesting.

The most significant risks to the rated quantity and pricing relate to the interaction between regional wood supply constraints and current feedstock demand by competitors. There are three separate forested areas within the BDO Zone from which pulpwood and forest residue can be sourced, comprising less than 15% of the total BDO Zone land area. Wood processing facilities in Colorado regularly harvest portions of two of these forested areas, making competition likely. Although the methodology used to determine the rated quantity accounts for this, it is possible that existing buyers could outbid a new bio-project for timber sales. Long transport distances and risk of wildfire compound wood supply constraints and competition risks.

Medium risk indicators relate to the limited size of the regional forest industry, increasing reliance on feedstock subsidies, and public opposition to forestry. There are only three wood processing facilities that bid on timber sales offered by the United States Forest Service (USFS) and Utah Trust Lands Administration. Any downturn in the wood product markets that these facilities supply would lead to reductions in sawtimber demand in the BDO Zone, putting pulpwood and forest residue supplies at risk. The relatively low number of potential suppliers for new bio-projects is notable, but associated risks are moderated by the low-rated quantity. Other risk categories present a low risk to the rated quantity and pricing.

BDO ZONE ASSETS

Forest residue is likely to be procured throughout the BDO Zone without any risk of competition. Dedicated chipping/grinding contractors have previously operated in the northern part of San Juan National Forest, in support of a cogeneration facility in Gypsum, CO (now closed). There is, therefore, a prospect that a new bio-project could work with experienced forest residue suppliers that are familiar with the logistics of mobile comminution in forested environments.

There are at least three forestry contractors in the area without strong ties to existing wood processing facilities. Outreach to one of these contractors confirmed that they would be able to supply roundwood to a new project using their own logging trucks. Forest residue could be procured from their operations with the establishment of a mobile comminution-chip truck tandem.

Timber sales from the two southern portions of the Manti-La Sal National Forest on the Utah side of the BDO Zone have been inactive for about a decade. This reflects a lack of proximal wood processing facilities. USFS timber sales managers contacted during outreach indicated that they would offer sales to a new bio-project. It is, therefore, likely that a bio-project willing to pay for roundwood and forest residue procured from the two southern portions of the Manti-La Sal NF would have open access, particularly from the area adjacent to Monticello.

BDO ZONE LIABILITIES

The majority of the rated quantity of biomass would be sourced from the southern portion of the Manti-La Sal National Forest. Commercial timber sales from this part of the Manti-La Sal NF have not occurred for over a decade. A timber sales manager for the Manti-La Sal NF noted during outreach that sales could theoretically increase if there was a company willing to pay stumpage and harvesting costs. However, this would likely require long lead times to assess the available resources and to set up timber sales contracts.

Wood supply is further limited in the BDO Zone due to the low forested area and lack of available alternative feedstocks (e.g., sawmill residues and pinyon-juniper woodlands). A procurement manager for one of the larger wood processing facilities in southwestern Colorado noted that it has become challenging to find forested stands of suitable stocking. Although this has not led to reductions in output, future bio-project proponents are advised to consider the possibility of a reduced and/or more volatile future wood supply.

Wood supply constraints are compounded by risks associated with competition and natural disturbances. Two wood processing facilities with intake capacities of over 100,000 bdt/yr are located in southwestern Colorado, within a 150-mile drive distance of Monticello. Both facilities source roundwood from the San Juan National Forest and Utah Trust lands in the La Sal Mountains, making them potential competitors for timber sales in these areas. A facility located in San Juan County, UT, would have a locational disadvantage and would have to pay for feedstock frequently sourced from a distance of over 65 miles.

The limited extent of forested area in the BDO Zone also elevates risks associated with natural disturbance events, in particular wildfire and insect outbreaks. Less than 150,000 acres of forested land is present in the BDO Zone. In 2018, a large wildfire in the San Juan National Forest affected 570,000 acres. While it is highly unlikely that all three forested areas would be affected by a major wildfire, significant fire-caused resource loss can be expected in future years. With regards to insect-caused resource loss, there is a heightened risk of outbreaks in the BDO Zone due to the historical record of insect damage in the broader region, in particular a mountain pine beetle outbreak in central and northern Colorado that has been occurring since the late 1990s.

Finally, the infrastructure risk assessment revealed liabilities associated with environmental quality. San Juan County is increasingly impacted by water scarcity. This creates challenges for water-intensive industries, which may face restrictions and shortages. There are also six uranium mines, active or abandoned, within 25 miles of Monticello. Future projects will likely require additional evaluations and rigorous safety protocols to address radioactivity concerns.

INFRASTRUCTURE PROFILE

Monticello, Utah, presents a marginal environment for industrial development for businesses in the sustainable and innovative sectors. Local government officials and community members are supportive of industrial growth, as evidenced by streamlined permitting processes and local business partnership promotion.

There are some environmental concerns about prior mining and soil quality. Accessibility by air and rail is very limited and could be a concern for new industries. Water availability has been a concern in recent years due to extended drought conditions.

The San Juan County, UT BDO Zone has several potential development sites, three of which are highlighted within this report. Ranging in size from 3 to 20 acres, these greenfield parcels are zoned for industrial development. Primary utilities are nearby in most cases. Housing and living costs are affordable due to the remoteness of the area.

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.

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

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 San Juan County, UT, is ***30.67 out of 100, resulting in a 'BB' designation.***

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

PROJECT TEAM

PROJECT DIRECTOR
D. Peter Wolf, PhD
Ecostrat Inc.
peter@ecostrat.com

INFRASTRUCTURE ANALYST
Bob Buckingham
Ecostrat Inc.
bob@ecostrat.com

TECHNICAL ADVISOR AND REVIEWER
Mahmood Ebadian, PhD
Director of Advisory Services
Ecostrat Inc.
mahmood@ecostrat.com

TECHNICAL CONTACT
Marcin Lewandowski
Senior Director, Operations & Risk
Ecostrat Inc.
marcin@ecostrat.com

BUSINESS CONTACT
Jordan R. Solomon
President & CEO
Ecostrat Inc.
jordan.solomon@ecostrat.com



SECTION A: RISK INDICATOR SUMMARY

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

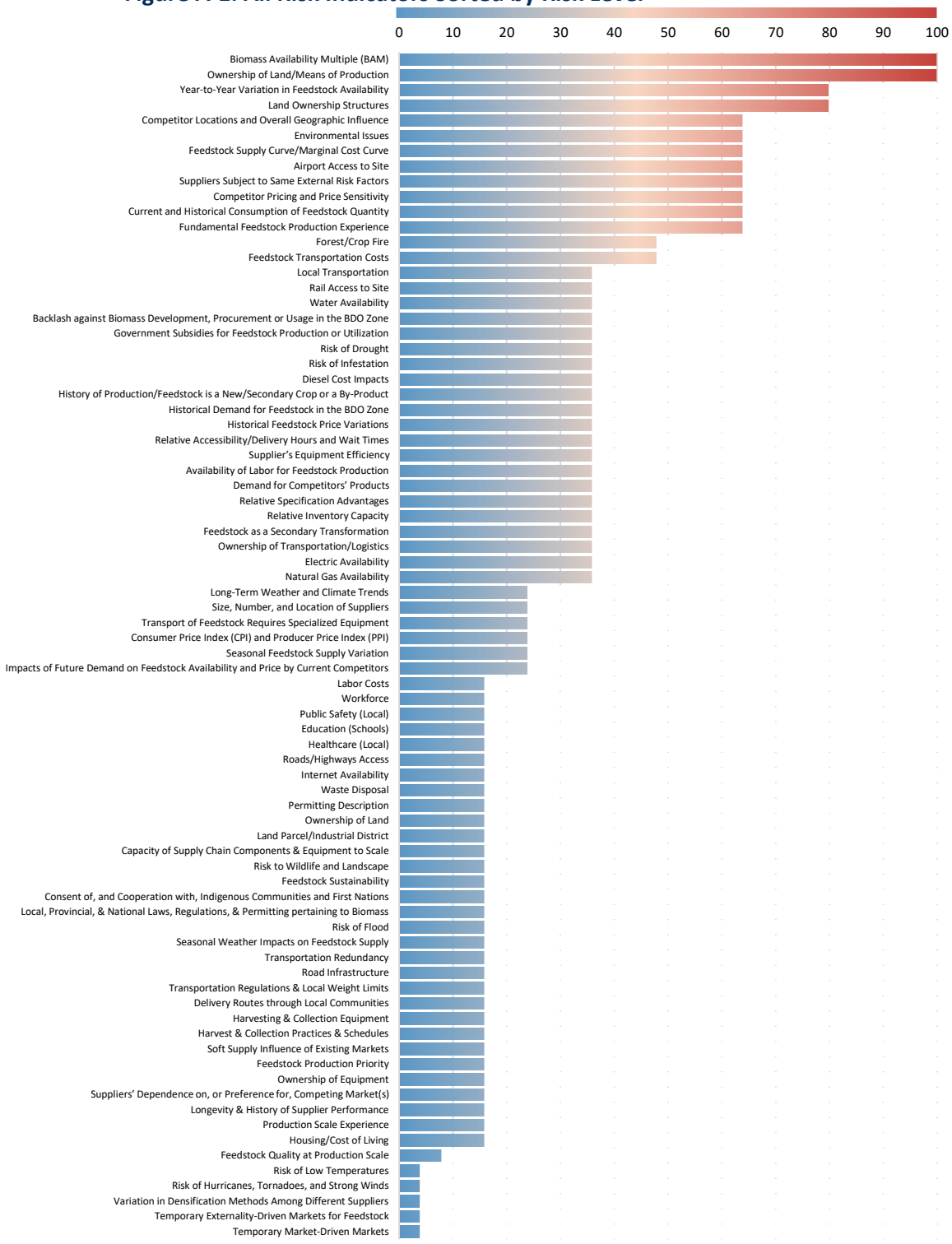


Table A-1. Risk Indicators and Associated Scores

Feedstock Supply Chain Risk Indicators	Raw Risk Likelihood	Raw Risk Impact	Gross Risk Indicator	Mitigation /Notching	Loaded RI Score
Category 1.0: Supplier Risk					
1.1 Risk Factor: Credit-Worthiness/Future Solvency of Suppliers					
1.1.1 Longevity & History of Supplier Performance	4	4	16	NN	16
1.2 Risk Factor: Conflicts of Interest/Vested Interest with Competing Market(s)					
1.2.1 Suppliers' Dependence on, or Preference for, Competing Market(s)	4	4	16	NN	16
1.3 Risk Factor: Supplier Control Over Production and Transportation					
1.3.1 Ownership of Land/Means of Production	10	10	100	NN	100
1.3.2 Ownership of Equipment	4	4	16	NN	16
1.3.3 Ownership of Transportation/Logistics	6	6	36	NN	36
1.3.4 Feedstock as a Secondary Transformation	6	6	36	NN	36
1.4 Risk Factor: Supplier Experience					
1.4.1 Fundamental Feedstock Production Experience	8	8	64	NN	64
1.4.2 Production Scale Experience	4	4	16	NN	16
1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity					
1.5.1 Supplier's Equipment Efficiency	6	6	36	NN	36
1.6 Risk Factor: Supplier Motivation					
1.6.1 Feedstock Production Priority	4	4	16	NN	16
Category 2.0: Competitor Risk					
2.1 Risk Factor: Influence on Feedstock Supply of Existing Markets					
2.1.1 Competitor Locations and Overall Geographic Influence	8	8	64	NN	64
2.1.2 Current and Historical Consumption of Feedstock Quantity	8	8	64	NN	64
2.1.3 Competitor Pricing and Price Sensitivity	8	8	64	NN	64
2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors	6	4	24	NN	24
2.1.5 Soft Supply Influence of Existing Markets	4	4	16	NN	16
2.1.6 Temporary Market-Driven Markets	2	2	4	NN	4
2.2 Risk Factor: Specific Competitors' Competitive Advantage					
2.2.1 Relative Inventory Capacity	6	6	36	NN	36
2.2.2 Relative Accessibility/Delivery Hours and Wait Times	6	6	36	NN	36
2.2.3 Relative Specification Advantages	6	6	36	NN	36
2.2.4 Demand for Competitors' Products	6	6	36	NN	36
Category 3.0: Supply Chain Risk					
3.1 Risk Factor: Feedstock Availability					
3.1.1 Biomass Availability Multiple (BAM)	10	10	100	NN	100
3.1.2 Feedstock Supply Curve/Marginal Cost Curve	8	8	64	NN	64
3.1.3 Seasonal Feedstock Supply Variation	4	6	24	NN	24
3.1.4 Year-to-Year Variation in Feedstock Availability	10	8	80	NN	80
3.2 Risk Factor: Historical Issues					
3.2.1 Historical Feedstock Price Variations	6	6	36	NN	36
3.2.2 Historical Demand for Feedstock in the BDO Zone	6	6	36	NN	36
3.2.3 History of Production/Feedstock is a New/Secondary Crop or a By-Product	6	6	36	NN	36
3.3 Risk Factor: Non-Weather Based Externalities					
3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)	6	4	24	NN	24
3.3.2 Currency Risk	NR	NR	NR	NR	NR
3.3.3 Border Risk	NR	NR	NR	NR	NR
3.3.4 Temporary Externality-Driven Markets for Feedstock	2	2	4	NN	4
3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection					
3.4.1 Harvest & Collection Practices & Schedules	4	4	16	NN	16
3.4.2 Harvesting & Collection Equipment	4	4	16	NN	16
3.4.3 Variation in Densification Methods Among Different Suppliers	2	2	4	NN	4
3.4.4 Availability of Labor for Feedstock Production	6	6	36	NN	36
3.5 Risk Factor: Transportation					
3.5.1 Feedstock Transportation Costs	8	6	48	NN	48
3.5.2 Diesel Cost Impacts	6	6	36	NN	36
3.5.3 Transport of Feedstock Requires Specialized Equipment	6	4	24	NN	24
3.5.4 Delivery Routes through Local Communities	4	4	16	NN	16
3.5.5 Transportation Regulations & Local Weight Limits	4	4	16	NN	16
3.5.6 Road Infrastructure	4	4	16	NN	16
3.5.7 Transportation Redundancy	4	4	16	NN	16

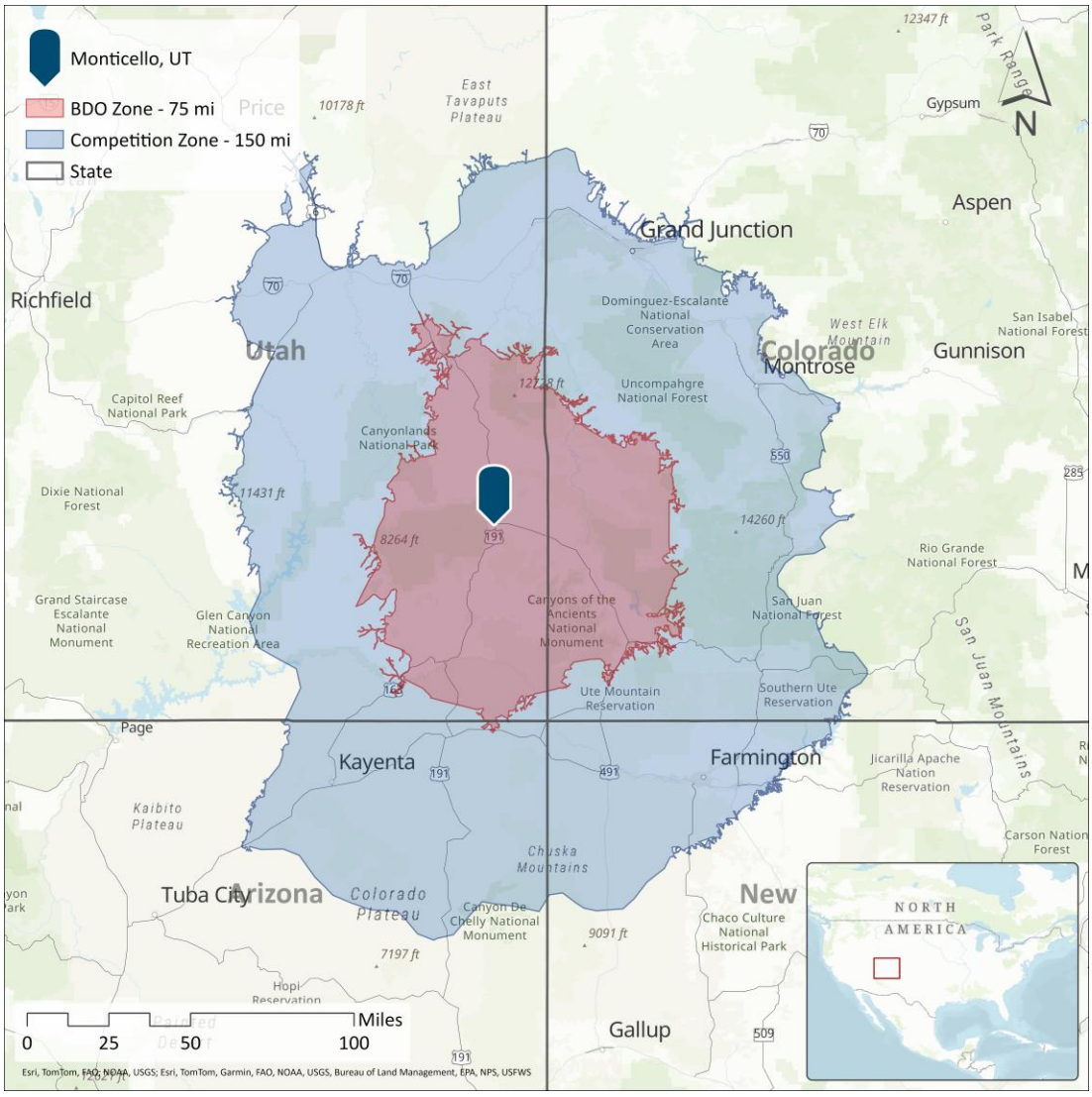
3.6 Risk Factor: Supply Chain Resiliency					
3.6.1 Size, Number, and Location of Suppliers	6	4	24	NN	24
3.6.2 Suppliers Subject to Same External Risk Factors	8	8	64	NN	64
3.6.3 Land Ownership Structures	8	10	80	NN	80
3.7 Risk Factor: Climate and Natural Risks					
3.7.1 Seasonal Weather Impacts on Feedstock Supply	4	4	16	NN	16
3.7.2 Long-Term Weather and Climate Trends	6	4	24	NN	24
3.7.3 Forest/Crop Fire	8	6	48	NN	48
3.7.4 Risk of Infestation	6	6	36	NN	36
3.7.5 Risk of Hail	NR	NR	NR	NR	NR
3.7.6 Risk of Flood	4	4	16	NN	16
3.7.7 Risk of Drought	6	6	36	NN	36
3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds	2	2	4	NN	4
3.7.9 Risk of Low Temperatures	2	2	4	NN	4
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	4	16	NN	16
3.8.3 Backlash against Biomass Development, Procurement or Usage in the BDO Zone	6	6	36	NN	36
3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations	4	4	16	NN	16
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	NR	NR	NR	NR	NR
3.9.3 Risk to Surface and Groundwater	NR	NR	NR	NR	NR
3.9.4 Water Use	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	4	4	16	NN	16
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	2	8	NN	8
4.1.2 Capacity of Supply Chain Components & Equipment to Scale	4	4	16	NN	16
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	4	4	16	NN	16
5.1.4 Environmental Issues	8	8	64	NN	64
5.2 Risk Factor: Utilities					
5.2.1 Natural Gas Availability	6	6	36	NN	36
5.2.2 Electric Availability	4	4	16	NN	16
5.2.3 Water Availability	6	6	36	NN	36
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	6	6	36	NN	36
5.3.3 Airport Access to Site	8	8	64	NN	64
5.3.4 Water Freight Access	NR	NR	NR	NR	NR
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	6	6	36	NN	36
5.4.4 Public Safety (Local)	4	4	16	NN	16
5.4.5 Housing/Cost of Living	4	4	16	NN	16
5.5 Risk Factor: Labor					
5.5.1 Workforce	4	4	16	NN	16
5.5.2 Labor Costs	4	4	16	NN	16
				Average	**30.67**

SECTION B: BIOMASS AVAILABILITY AND PRICING

OVERVIEW

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

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



EVALUATED FEEDSTOCKS

Pulpwood: Roundwood that cannot be milled into solid wood products due to small diameter, irregular form, or other defect. Also referred to as low grade roundwood. For the Utah side of the BDO Zone, the term "pulpwood" is also applied to roundwood procured from timber sales, a portion of which could meet sawtimber specifications.

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

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

Woodland biomass: The aboveground mass of trees recovered during whole-tree harvesting operations in pinyon-juniper (PJ) woodlands.

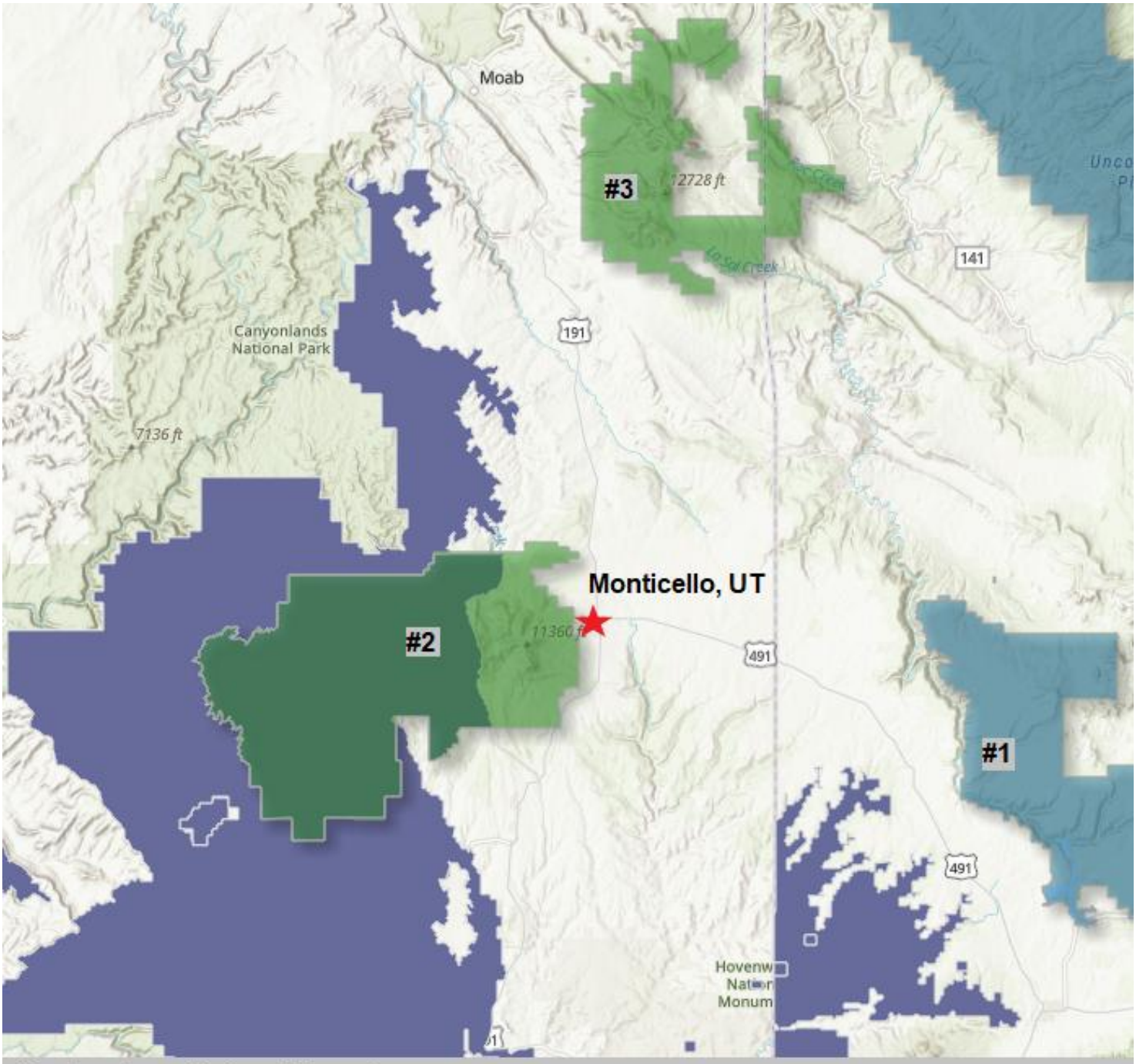
SUPPLY ANALYSIS

The BDO Zone is centered in southeast Utah, an area primarily consisting of desert scrubland. Commercial quantities of pulpwood and forest residue could be generated within three distinct clusters of forested land owned and managed primarily by the United States Forest Service (USFS) (Map B-2). Forestry activity in the past ten years has been concentrated in the eastern extent of the BDO Zone, which encompasses the western-most portion of the San Juan National Forest (NF) in Colorado (#1, Map B-2). Timber sales and consequent harvesting activity are driven primarily by two forest companies with annual throughputs of approximately 200,000 tons/yr of sawtimber.

Over the period 2014-2023, an average of 3.9 million board feet (MMBF) of sawtimber, or approximately 23,000 tons/yr, was sourced from the portion of the San Juan NF that falls within the BDO Zone.[1] Sawtimber generally consists of logs with a small-end diameter >8 inches and with sufficient form and quality for milling into solid wood products. San Juan NF timber sales have increased considerably over the past six years and therefore this level of harvesting activity is likely to continue (Figure E-1, Section E).

[1] Production from the San Juan NF was estimated using USFS Forest Inventory and Analysis (FIA) data and corroborated using USFS San Juan NF harvesting data over the period 2014-2023 (https://www.fs.usda.gov/forestmanagement/products/cut-sold/index.shtml). During outreach to local forestry professionals it was noted that the majority of annual wood supply sourced from the San Juan NF is cut from the western portion of the NF due to the presence of a large sawmill in the area. To convert from MMBF to tons, a conversion factor of 6,000 tons per MMBF was used.

Map B-2. Forested Areas Within San Juan County, UT BDO Zone[2]



[2] ArcGIS Map Viewer (https://www.arcgis.com/home/item.html?id=effa410a870e460a883bebe55ee64503)

Forestry activity in the southern portion of the Manti-La Sal National Forest (NF) on the Utah side of the BDO Zone is limited (#2 and #3, Map B-2). Harvesting over the past decade has been restricted to special projects with the principal objective of ecological restoration or wildfire mitigation.[3] Potential wood supply from forests in the area has also been affected by the creation of the Bears Ears National Monument in 2016, which designated a portion of the Manti-La Sal NF as a national monument (#2 (dark green), Map B-2). Annual wood supply from these areas has therefore been limited or nonexistent in recent years.

We confirmed through discussions with the timber program manager for the Manti-La Sal NF that wood supply could be available from the southern portions of the NF if a new project was willing to bid on timber sales. Therefore, to estimate wood supply from the southern portions of the Manti-La Sal NF, we assume that a new project proponent works with the USFS to arrange for a renewal of timber sales in the area. It is further assumed that all material recoverable from forest operations (including sawtimber) is procured by a new bio-project. This assumption is supported by the fact that the sawmills in the region have not been interested or able to economically source sawtimber from these areas of the Manti-La Sal NF for the past decade. A new bio-project located in the BDO Zone would be able to source biomass from these forested areas over transport distances of less than 75 miles.

Under these assumptions, the total quantity of biomass produced annually in the BDO Zone amounts to 15,600 bdt/yr, including 12,100 bdt/yr of pulpwood and 5,600 bdt/yr of forest residue.[4] A total of 7,900 bdt/yr of roundwood (pulpwood) and 1,600 bdt/yr of forest residue could be produced from the two forested areas within the Manti-La Sal NF managed by the USFS (#2 and #3, Map B-1). An additional 1,250 bdt/yr of forest residue could be produced from ecological restoration operations on Utah Trust lands in the La Sal Mountains (embedded within #3, Map B-1). For the western-most area of the San Juan NF that is included in the BDO Zone (#1, Map B-1), a total of 4,200 bdt/yr of pulpwood and 2,800 bdt/yr of forest residue could be generated annually.

Woody biomass would not be consistently available from pinyon-juniper (PJ) woodland treatments on Bureau of Land Management (BLM) lands or Utah Trust lands.[5] Feedstock supply from PJ woodlands was therefore not rated for new projects. Sawmill residue was also not rated, as residues produced by the two larger wood processing facilities in the BDO Zone are fully utilized. Two small sawmills located in Monticello have annual log throughputs of less than 500 green tons per year and therefore were not considered as potential suppliers for new bio-projects. Project developers should consider the possibility that the capacity of these mills could be expanded under the right conditions.

COMPETITION ANALYSIS

There are only two facilities located within a 150-mile drive distance of Monticello that could compete for the generated quantities of wood fiber. A dimensional sawmill in Dolores, CO, consumes approximately 100,000 bdt/yr of roundwood, and an associated wood product manufacturing facility in Mancos, CO, consumes a similar amount of roundwood and sawmill byproducts.[6] Both mills purchase roundwood from the San Juan NF and from Utah Trust lands in the La Sal Mountains and therefore could compete for timber sales offered in the Manti-La Sal NF. There are currently no markets for forest residue; slash is piled and burned or masticated following forest operations.

Other competitors to future bio-based projects located within 150 miles of Monticello have low intake capacities and, therefore, were not considered in the competition analysis. The Wood for Life program recovers small quantities of wood fiber annually from forest restoration projects, for use as fuelwood by indigenous communities. An association

[3] These projects have been carried out by, or in collaboration with, the National Wild Turkey Federation.
[4] To calculate pulpwood production, a pulpwood factor of 30% was applied to the sawtimber production estimate of 23,000 tons/yr. The factor of 30% was determined through outreach. Green tons were converted to bdt using a moisture content range of 40-50%. Forest residue production was estimated using a residue factor of 20% applied to sawtimber production.
[5] Outreach to BLM – Monticello, UT field office.
[6] The latter mill produces pellets and excelsior, which is a material used in evaporative coolers and erosion control material.

representing individuals and organizations interested in the growth of a regional biomass heating industry (the Alliance for Green Heat) operates in the area but does not source significant quantities of wood fiber for this purpose.

RATED QUANTITIES AND PRICING

The rated quantity available for new projects at moderate risk is estimated to be 10,000 bdt/yr. This estimate was derived by assuming that half of the low grade roundwood produced within the western area of San Juan NF would be available for a new project and by applying a Biomass Availability Multiple (BAM) of 1.5x to feedstock availability estimates. The BAM of 1.5x effectively decreases the amount of pulpwood and forest residue estimated to be available to new developers by 33%, accounting for uncertainty in underlying data and assumptions (see Risk Indicator 3.1.1). Delivered prices for each feedstock type were estimated based on outreach and with reference to BDO Zone Ratings recently issued in Arizona.[7] Available quantities (after deducting near-term competition from supply potential), rated quantities, and rated pricing for the evaluated feedstock types are summarized in Table B-1.

Table B-1. Available and Rated Quantities and Corresponding Rated Price Range for the Evaluated Feedstocks

Feedstock type	Available quantity (bdt/yr)[8]	Rated quantity (bdt/yr)	Rated price range ($/bdt delivered)[9]
Pulpwood	10,000	6,500	$80-$100
Forest residues	5,600	3,500	$60-$70

[7] Coconino County, AZ and Little Colorado River, AZ BDO Zones (https://bdozone.org/rating-awards/).
[8] Calculated by subtracting current demand (as derived in Competition Analysis subsection) from total supply potential (as derived in Supply Analysis subsection).
[9] Prices based on outreach to local forestry professionals.

SECTION C: INFRASTRUCTURE



Two Parcels, 20 Acres / 8 Acres, County-owned

PROPERTY OVERVIEW

Address:	0.8 miles east of Hwy 191, .25 miles north of Hwy 491
City:	Monticello, UT
County:	San Juan
Acres:	28 acres on two parcels
Pricing Note:	
Lease Available:	No
Topography:	Graded / loose dirt
Zoning:	M-Industrial
Building on site:	No

SITE CONTACTS

Mack McDonald
Chief Administrative Officer
San Juan County, UT
117 South Main Street
Monticello, UT 84535
mmcdonald@sanjuancounty.org

ADDITIONAL NON-RATED SITES

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

PROPERTY PROFILE

This parcel consists of two buildable industrial sites. The sites can be combined or acquired separately. Both are owned by San Juan County, are greenfield, and have basic utilities at the southern edge. The properties are on former agricultural land and are leveled.

Transportation

Nearest Highway: Highway 491/191
Nearest Interstate: I-70 (81 miles)
Nearest Airport: Monticello (3 miles)
Rail Served: Nearby <2 miles
Rail Accessible: Transmodal – Western New York and Penn Railroad
Air Infrastructure in Place: No
Nearest Commercial Airport: Moab, UT (55 miles – Direct service to Denver and Phoenix.

Electric Service

Supplier: Empire Electric Association
Ownership: Co-op
Phone: 970-565-4444
Website: www.eea.coop.org
All Utilities Extend to Site: Yes
Nearest Substation: Adjacent
Capability: Service is available up to 15 kV at the site

Natural Gas

Supplier: Utah Gas Services / Enbridge Gas
Ownership: Privately Owned
Phone: 800-323-5517
Website: www.dominionenergy.com/Utah
Size of Main: 4" available .4 miles east
Pressure: 50 psi
Capability: Primary 26" pipeline is 11 miles to the north

Water

Supplier: Monticello City Services
Ownership: Municipal
Phone: 435-587-2271
Website: www.monticelloutah.org
Size of Main: 12"
Peak Capacity: 1,000,000 gallons/day
Capability: Piping for industrial volumes

Wastewater

Supplier: Monticello City Services
Ownership: Municipal
Phone: 435-587-2271
Website: www.monticelloutah.org
Size of Main: 6-12"
Capability: 1,000,000 gallons/day

Telecommunications

Supplier: Hughesnet
Ownership: Private
Phone: 877-916-5850
Website: www.hughesnet.com
Platforms: Fiber, wireless
Capability: Primary wireless and fiber optics available

SECTION C: INFRASTRUCTURE (CONTINUED)



Small Industrial Acreage, City-Owned

PROPERTY OVERVIEW

Address:	1.6 miles east of Hwy 191, 0.25 miles south of Hwy 491
City:	Monticello, UT
County:	San Juan
Acres:	3 acres
Pricing Note:	
Lease Available:	No
Topography:	Graded / loose dirt
Zoning:	M-Industrial
Building on Site:	No

SITE CONTACTS

Mack McDonald
Chief Administrative Officer
San Juan County, UT
117 South Main Street
Monticello, UT 84535
mmcdonald@sanjuancounty.org

ADDITIONAL NON-RATED SITES

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

PROPERTY PROFILE

This 3-acre site is located less than 2 miles from Monticello, UT. It is owned by the City of Monticello and offers easy access from Highway 419. The site is adjacent to a primary power substation yard. Refer to Section E for additional site and map information.

Transportation

Nearest Highway: Highway 491/191
Nearest Interstate: I-70 (81 miles)
Nearest Airport: Monticello (3 miles)
Rail Served: Nearby <2 miles
Rail Accessible: Transmodal – Western New York and Penn Railroad
Air Infrastructure in Place: No
Nearest Commercial Airport: Moab, UT (55 miles – Direct service to Denver and Phoenix.

Electric Service

Supplier: Empire Electric Association
Ownership: Co-op
Phone: 970-565-4444
Website: www.eea.coop.org
All Utilities Extend to Site: Yes
Nearest Substation: Adjacent
Capability: Service is available up to 15 kV at the site

Natural Gas

Supplier: Utah Gas Services / Enbridge Gas
Ownership: Privately Owned
Phone: 800-323-5517
Website: www.dominionenergy.com/Utah
Size of Main: 4" available 0.4 miles east
Pressure: 50 psi
Capability: Primary 26" pipeline is 11 miles to the north

Water

Supplier: Monticello City Services
Ownership: Municipal
Phone: 435-587-2271
Website: www.monticelloutah.org
Size of Main: 12"
Peak Capacity: 1,000,000 gallons/day
Capability: Piping for industrial volumes

Wastewater

Supplier: Monticello City Services
Ownership: Municipal
Phone: 435-587-2271
Website: www.monticelloutah.org
Size of Main: 6-12"
Capability: 1,000,000 gallons/day

Telecommunications

Supplier: Hughesnet
Ownership: Private
Phone: 877-916-5850
Website: www.hughesnet.com
Platforms: Fiber, wireless
Capability: Primary wireless and fiber optics available

SECTION D: RISK INDICATOR SCORING METRICS

CATEGORY 1.0: SUPPLIER RISK

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

1.1.1 Longevity & History of Supplier Performance

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

Risk Information: Logging and chipping/grinding contractors are the main potential suppliers of low grade roundwood ("pulpwood") and forest residue in the region. The effects of a plywood mill closure in 2021 have been offset by the growth of wood demand at wood processing facilities in Montrose, Mancos, and Dolores.[10] Therefore, the regional contractor base has likely remained relatively steady over the past five years. There are at least three independent logging contractors that have been in business for over a decade that could supply new bio-projects.

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**

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: The larger wood processing facilities in the region are vertically integrated, with their own dedicated logging crews. However, there are at least three independent logging contractors that do not have strong affiliations with these facilities.

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**

[10] https://www.durangoherald.com/articles/ironwood-mill-juggles-lawsuit-with-plans-for-100-million-startup/

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**

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: The rated quantities of pulpwood and forest residue are likely to be sourced from federal and state lands. Forested federal lands are managed by the USFS and include the Manti-La Sal NF in southeast Utah and the San Juan NF in southwest Colorado. State-owned forested lands in the BDO Zone are managed by the Utah Trust Lands Association and are located in the La Sal Mountains adjacent to a portion of the Manti-La Sal NF, to the north of Monticello. Biomass supply from federal and state lands is typically arranged through competitive bidding on timber sales, stewardship contracts, and other arrangements. Risk is assessed as very high due to the relative scarcity of timber supply in the region, the lack of timber sales from the southern portion of the Manti-La Sal NF over the past decade, and risk that companies in Colorado could outbid a new project developer. Note that private lands contribute minor amounts to total wood supply and are not considered in the analysis.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very high, therefore the RRL is 10 out of 10.	**Score** **10**
Raw Risk Impact (RRI) The risk impact is deemed very high, therefore the RRI is 10 out of 10.	**Score** **10**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 100 out of 100.	**Score** **100**
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 100 out of 100.	**Score** **100**

1.3.2 Ownership of Equipment

Rationale: In most cases, suppliers that own or lease equipment for harvest, collection, and processing feedstock are at lower risk than those that are not. For example, third-party harvesting equipment may not be available when required. Short harvest windows may be missed if a farmer and contractor cannot schedule convenient harvest times, and quantity shortages can result. However, in some circumstances, reliance on third-party equipment to harvest or

produce feedstock can decrease supply chain risk. For example, when harvesting agricultural residues such as corn stover, using a third-party company with standard equipment specializing in harvesting, collection, and transportation may decrease quality variations (e.g., ash content) of the final feedstock.

Risk Information: Logging equipment tends to be owned by logging contractors rather than by sawmills and other wood processing facilities. Some chipping and grinding equipment that was once available in the region was recently sold off in response to the closure of a cogeneration plant in Gypsum, CO. At least two chipping and grinding units are owned by small businesses in the region and units are also known to be available for purchase or lease from businesses in Grand Junction, CO.

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**

1.3.3 Ownership of Transportation/Logistics

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

Risk Information: Logging trucks are owned by logging contractors and small businesses with fewer than two truck-trailer tandems. Chip trucks tend to be controlled by wood processing facilities. Whereas logging trucks are likely to be available for the rated quantities, there is risk associated with the availability of chip trucks due to control by wood processing facilities. Risk impact is moderated by the relatively low rated quantity of forest residue, which would require chip trucks for delivery to a new project.

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.	**NN**

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

1.3.4 Feedstock as a Secondary Transformation

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

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

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 production of pulpwood and forest residue during conventional forest operations will generally not impede the production of sawtimber. However, harvesting activity in most areas will tend to be driven by primary wood product markets. Any downturn in primary wood product markets would lead to a reduction in the availability of pulpwood and forest residue. The two wood processing facilities in southwestern Colorado have had steady or increasing product output (and sawtimber demand) in recent years, providing some assurances that sawtimber harvesting will be sufficient to support the procurement of the rated quantities of pulpwood and forest residue. However, future market downturns cannot be ruled out. A new bio-project is likely to have exclusive access to most roundwood available from timber sales on the Manti-La Sal NF for the rated price range, moderating risk.

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.	**NN**
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

1.4 Risk Factor: Supplier Experience

1.4.1 Fundamental Feedstock Production Experience

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

Risk Information: Low-grade roundwood available on the Colorado side of the BDO Zone is produced as a byproduct of sawtimber operations and therefore poses no risk. However, harvesting has been rare over the past decade on the Utah side of the BDO Zone. With regards to forest residue, there is limited experience recovering this feedstock type in the region.

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

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: There is no significant production scale experience risk due to the low rated quantity.

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

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: Forest operations in the region are fully mechanized, consisting of feller bunchers, grapple skidders, processors, and log loaders. Forestry contractors contacted during outreach did not express concerns over operational efficiency and noted that a mix of newer and older (15+ years) equipment is used. Tethered logging equipment that enables operation on steeper terrain is making inroads in the region but is still uncommon. The efficiency of mobile chipping and grinding operations could be negatively affected by slope and narrow operating areas in some parts of the Manti-La Sal NF and San Juan NF.

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

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 corn stover (e.g., corn) or forest residues (e.g., pulpwood), supply may not be a top priority for a supplier.

Risk Information: As described in Risk Indicator 1.3.4, sawtimber production is not likely to be affected by the recovery of pulpwood and forest residue. Recovery of forest residue, which can be logistically challenging, is likely to occur long after sawtimber and pulpwood have been delivered to market.

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**

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: There are only two facilities within a 150-mile drive distance of Monticello with intake capacities larger than 500 bdt/yr. One is a dimensional sawmill in Dolores, CO, which uses around 100,000 bdt/year of roundwood. The other is a wood product manufacturing facility in Mancos, CO, which consumes a similar volume of roundwood and byproducts from sawmills. Both facilities source roundwood from the San Juan National Forest and Utah Trust lands in the La Sal Mountains, making them potential competitors for timber sales in the Manti-La Sal National Forest. There are currently no buyers of forest residue in the region. The two competitors for roundwood are located in close proximity to the largest source of wood supply in the region (San Juan NF) and therefore locational risk of a new bio-project in San Juan County, Utah, is amplified. Note also that significant locational risks would result if a new bio-project is developed in southwestern Colorado following the issue of the Region Nine, CO BDO Zone Rating.

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)* 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 64 out of 100.	**Score** **64**

2.1.2 Current and Historical Consumption of Feedstock Quantity

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

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

Risk Information: The two identified competitors in Colorado have increased production in recent years. The facility in Mancos was purchased by the current owner in 2016/2017 and local forestry professionals contacted during outreach had the impression of increasing production at the facility. While no forest residue is presently consumed in the Competition Zone, a portion of the residue generated in the San Juan NF was sent to a cogeneration plant in Gypsum, CO up until its closure in 2022. The production trend of roundwood purchasers constitutes a risk to new projects, whereas the reduction of demand for forest residue constitutes an asset.

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

2.1.3 Competitor Pricing and Price Sensitivity

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

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

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

Risk Information: Third party wood price data is not available for Utah and Colorado. One of the five logging contractors that regularly operates in the BDO Zone noted that he prefers not to sell sawtimber to the larger sawmills because they do not pay a sufficient price. Given the relatively large volume of roundwood that the two competing wood processing

facilities intake annually, competitor pricing risk is deemed to be high. Forests in the region are slow growing and additional competition for roundwood supplies could lead to price competition with established facilities.

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

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

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

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

Risk Information: We associate a medium risk with the prospect for increased production by the two large competitors, which would increase regional demand for roundwood. There are, however, no indications that forest residue will be utilized in the future by existing competitors.

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

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: There are at least three contractors in the region who operate with a degree of autonomy from the larger wood processing facilities in Colorado. Other contractors work exclusively for the larger facilities. A single crew could supply the entire rated quantity of pulpwood and therefore risk of pre-existing business relationships between suppliers and the larger competitors is deemed to be low.[11]

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

2.1.6 Temporary Market-Driven Markets

Rationale: Alternative, non-traditional, market-driven competitors for feedstock can drive feedstock demand in unusual circumstances. A BDO Zone Rating Issuer based on corn stover as a feedstock, for example, would not typically compete with higher-end animal feed markets due to quality issues. However, in times of significant hay shortage (e.g., during drought), farmers use corn stover in place of hay, driving the price of feedstock and decreasing availability for bio-projects.[12]

Risk Information: No temporary competitors for the rated quantities of feedstock were identified.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	2
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	2
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	4
Mitigation/Notching	**Notch**

[11] A crew producing two loads of pulpwood daily (60 tons) and operating 25 days per month and 8 months per year would produce the rated quantity.
[12] Bergtold, 2018.

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

2.2 Risk Factor: Specific Competitors' Competitive Advantage

2.2.1 Relative Inventory Capacity

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

Risk Information: The competing facilities in Mancos and Dolores have relatively large outdoor storage areas where logs are stockpiled. Risk is elevated because the Mancos facility is located within the San Juan NF and is known for buying non-sawtimber roundwood ("pulpwood"). Stockpiling is a plausible strategy that the facility managers could use if a new bio-project was viewed as a threat to operations. This strategy could also be used for roundwood sourced from future timber sales on the Utah side of the BDO Zone, but a bio-project located within or near San Juan County would have a locational advantage for these supplies.

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**

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: Being located within or adjacent to San Juan NF, the identified competitors have an inherent advantage in terms of accessibility for the portion of the rated quantity likely to come from this area. Logging contractors and independent logging transportation service providers operating in San Juan NF would likely prefer to deliver to

these facilities. A new bio-project located on the Utah side of the BDO Zone would have an accessibility advantage for any roundwood and residue sourced from the Manti-La Sal NF.
Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

2.2.3 Relative Specification Advantages

Rationale: When choosing a market for biomass feedstock, suppliers not only look at price but also at relative quality requirements or specifications. It is important to understand feedstock quality specifications for competing markets within the BDO Zone in order to accurately quantify the risk that competitors can exert on the Issuer's supply chain.
Risk Information: Low grade roundwood is currently purchased by a single large competitor located in Mancos, CO. The facility has a locational advantage to supplies sourced from the San Juan NF but could pay a premium for roundwood procured from the La Sal Mountains in Utah. There are no buyers of forest residue in the Competition 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)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

2.2.4 Demand for Competitors' Products

Rationale: Increased demand for the competitor's final product can cause increased demand for feedstock by the competitor. For example, an increased demand for wood pellets due to high energy prices in Europe or for biofuels due

to a favorable clean fuels policy can cause increased pellet/biofuel production by competing markets. Thereby driving demand for feedstock within a BDO Zone.

Risk Information: A company involved in the production of excelsior and derived products has been increasing output since it purchased the facility in 2016/2017. A portion of the rated quantity of pulpwood sourced from the Manti-La Sal NF in Utah is likely to be comprised of sawtimber, leading to potential competition with the single large sawmill in Dolores, CO if sawn wood product demand increases at any point in the future. Solid wood product market prices have evidently not been sufficient to generate interest in timber sales from the southern portion of the Manti-La Sal NF over the past decade, reducing risk.

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**

CATEGORY 3.0: SUPPLY CHAIN RISK

3.1 Risk Factor: Feedstock Availability

3.1.1 Biomass Availability Multiple (BAM)

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

Risk Information: To estimate the rated quantity of biomass that new projects could access, a BAM of 1.5x was applied to the estimate of feedstock availability (total annual generation – competition). While this BAM value provides some assurances that the rated quantities can be made available, there are uncertainties associated with underlying data, models, assumptions, and future operating conditions. The most significant uncertainty relates to the availability of timber sales on the Utah side of the BDO Zone. Conversations with the timber program manager at the Manti-La Sal NF confirmed that timber sales would likely be offered if there was a company willing to bid in the area. However, the manager cautioned that there could be delays or wood supply constraints associated with forest stands on or near the Bears Ears National Monument or other areas with cultural significance. MBF-to-ton and pulpwood-to-sawtimber conversion factors are other sources of potential inaccuracy in final estimates.

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

Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 100 out of 100.	**100**
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 100 out of 100.	**100**

3.1.2 Feedstock Supply Curve/Marginal Cost Curve

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

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

Risk Information: The forest resource is concentrated within three distinct forested areas in the BDO Zone. One area is located adjacent to Monticello and would likely be associated with transport distances <30 miles. The two other areas (La Sal Mountains and western San Juan NF) are located on the periphery of the BDO Zone and would likely involve transportation distances of 60-75 miles. There is therefore elevated risk associated with the transportation phase of the supply chain, including delivered costs and diesel price volatility.

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 *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 64 out of 100.	**64**

3.1.3 Seasonal Feedstock Supply Variation

Rationale: Biomass supply can present significant seasonal variations. Seasonal supply variations, combined with limitations associated with longer-distance transportation and storage, can lead to BDO Zone biomass supply imbalances,[13] which can manifest in shortages and higher costs for Issuers.

Risk Information: Forestry and trucking operations typically run for 8-10 months each year, pausing during periods of heavy snowfall (e.g., December to February) and heavy rainfall. Summer wildfires can also cause interruptions, as logging contractors are often required to assist with firefighting efforts near their operational areas. Risk impact is increased due to the limited extent of forested area 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 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**

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: Interannual variation in roundwood and forest residue supply is expected to be relatively high in the BDO Zone due to the limited wood supply in the area. Timber sales from the Manti-La Sal NF in Utah are expected to have a particularly slow, uneven start in initial years, as no harvesting has occurred in the southern portion of the National Forest for a decade.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very high, therefore the RRL is 10 out of 10.	**10**
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 80 out of 100.	**80**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)*	**NN**

[13] Golecha & Gan, 2016.

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 80 out of 100. **80**

3.2 Risk Factor: Historical Issues

3.2.1 Historical Feedstock Price Variations

Rationale: If the historical feedstock price shows volatility, then the risk of future price fluctuation is elevated. If feedstock prices have historically exceeded the price at which the Issuer would have to cease operations or breach a financial covenant (i.e., the "red line" feedstock cost), then mitigation measures should be put in place.

Risk Information: Third party pricing data is not available for the region. Historical price fluctuations can be inferred from facility operational history and regional wood supply. With regards to the record of wood processing facility openings and closures, prices likely declined following the closure of the facility in Mancos in 2016/17. However, the purchase and rebuild of the facility by another company eventually led to increasing sales and a likely increase in roundwood prices. With regards to regional wood supply, we determined through outreach that many logging professionals believe that wood supply is declining, due in part to slow forest growth rates and a history of intensive logging.

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

3.2.2 Historical Demand for Feedstock in the BDO Zone

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

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

Risk Information: The forests of the region previously supported a much larger annual throughput of timber. The current level of production is sustained by the regional contractor base. The rated quantities are modest and are not likely to overextend current logging capacity. Forest residue production is uncommon in the region and therefore some risk is associated with this aspect of future biomass supply chains.

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

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

Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**

Mitigation/Notching	**Notch**
RRL Mitigation (Notch) 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**

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

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

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

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

Risk Information: Harvesting activity reached historic highs in the 1990s when a large Louisiana-Pacific plywood mill was operating in Olathe, CO. Harvesting activity declined following the closure of the mill in 2002. There are now only a few wood processing facilities that maintain demand for USFS timber sales and therefore exposure to risk of wood product market downturns is pronounced.

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.	**NN**

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

3.3 Risk Factor: Non-Weather Based Externalities

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

Rationale: CPI and PPI can impact feedstock cost of harvest and collection over time. Sensitivities to worst-case scenarios should be run.

Risk Information: Between 2021 and 2022, the Consumer Price Index (CPI) and the national Producer Price Index (PPI) saw sharp increases due to the COVID-19 pandemic, lockdowns, and global supply chain disruptions. Since 2023, however, these inflationary pressures have started to stabilize, due in part to the Federal Reserve's interest rate hikes. Despite the recent improvements in CPI and PPI figures, the economic outlook remains more uncertain than before the high inflation of 2021-2022.

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**

3.3.2 Currency Risk

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

Risk Information: Not relevant.

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

3.3.3 Border Risk

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

Risk Information: Not relevant.

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

3.3.4 Temporary Externality-Driven Markets for Feedstock

Rationale: Alternative, non-traditional, externality-driven competitors for feedstock can drive feedstock demand (and cost) in unusual circumstances. For example, an Issuer using corn stover as a feedstock would not typically compete with the higher-end animal feed market. However, in times of significant hay shortage (e.g., during drought), farmers may use corn stover as hay replacement, driving the price of stover feedstock and decreasing its availability for bio-projects.[14]

Risk Information: No alternative, non-traditional competitors were identified.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) 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**

[14] Bergtold, 2018.

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

3.4.1 Harvest & Collection Practices & Schedules

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

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

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

Risk Information: Road building or maintenance is typically required before forest operations can commence and therefore most logging companies own bulldozers and equipment required to grade roads. Slash piles are generally left in situ for one year before being treated (typically through open burning). Parties interested in sourcing biomass from slash piles (forest residues) would likely be required to chip/grind the biomass near the end of logging operations. This is not likely to result in operational inefficiencies when properly managed.

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**

3.4.2 Harvesting & Collection Equipment

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

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

Risk Information: Although there are no dedicated mobile chipping/grinding contractors currently operating, there are a number of businesses in the area that offer equipment sales and rentals. Other equipment used to recover biomass is available and does not pose a risk to future biomass supply chains (see Risk Indicator 1.5.1).

Raw Risk Likelihood (RRL)	**Score**

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**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**

3.4.3 Variation in Densification Methods Among Different Suppliers

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

Bales of different densities can absorb moisture at different rates. In certain cases, round bales have been viewed as problematic due to their uneven moisture content distribution.[15]

Risk Information: Feedstock variation is unlikely to impact new projects if procurement managers specify feedstock quality expectations and manage the supply chain accordingly. There are several establishments in the area that offer sales and rentals of biomass processing equipment (e.g., mobile chipping and grinding units).

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**

[15] Huhnke, 2018.

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: Conventional forestry operations are typically undertaken by experienced Utah- and Colorado-based contractors. Thinning operations carried out under Good Neighbor Authority (GNA), Stewardship Agreements/Contracts, and other programs are typically led by crews from out-of-state (Oregon and Washington). Outreach to logging contractors confirmed that it is often difficult finding reliable, skilled equipment operators, a problem common to modern North American forestry. Although a new project is unlikely to have difficulty sourcing the rated quantities of roundwood and residue, labor could become temporarily unavailable if trends do not change.

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 Risk Factor: Transportation

3.5.1 Feedstock Transportation Costs

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

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

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

Risk Information: The roadways connecting the three forested areas in the BDO Zone are well-maintained and permit travel speeds of over 60 miles/hour. Travel speeds are often reduced to below 40 miles/hour in some forested operating areas due to the presence of gravel roads and steep terrain. Transportation costs in the region are typically in the range of $6-$10 per loaded mile for logging trucks. Risk that feedstock transportation costs will increase beyond this range are enhanced because most of the forest resources are located on the periphery of the BDO Zone (60-75 miles).

Raw Risk Likelihood (RRL)	**Score**

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)* 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 48 out of 100.	**Score** **48**

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: Diesel prices in the Rocky Mountain region have closely mirrored average US diesel prices over the 1995-2023 period (Figure E-2, Section E). Inflation-adjusted diesel prices have slightly decreased since the 2008-2013 period but remain higher than the 2014-2021 period (Figure E-3, Section E). Forestry professionals in the region generally believe that diesel prices are the main limiting factor in profitable deliveries of feedstock. As of September 2024, the US EIA forecasts a slight decline in retail diesel prices in 2025.[16] Overall risk associated with diesel costs is judged to be medium due to the long distances between the center point (Monticello, UT) and forested areas from which feedstock is likely to be procured.

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**

[16] https://www.eia.gov/outlooks/steo/report/petro_prod.php

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: Chip trucks required for transportation of the rated quantities of forest residue are likely controlled by the larger wood processing facilities in the region. A new project proponent would therefore need to invest in (or incent investment in) a single truck-walking floor trailer combination or other truck-trailer configuration to ensure delivery of the rated quantity of forest residue. This represents a low risk to new projects. Most logging contractors own at least one logging truck and can rely on other owner-operators when required, although there can be delays.

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**

3.5.4 Delivery Routes through Local Communities

Rationale: Transportation of biomass can become a nuisance to local communities, especially if a large number of trucks pass through residential and school areas. Local communities often have the power to force regulations regarding truck transport, impeding the ability of BDO Zone suppliers to transport feedstock.

Risk Information: There were no indications during outreach that local communities are opposed to truck traffic. The rated quantities would lead to a modest increase in truck traffic and therefore low risk is associated with this indicator.

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

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

3.5.5 Transportation Regulations & Local Weight Limits

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

Risk Information: Commercial trucks can have a gross vehicle weight (GVW) of up to 85,000 lbs on most roads, not including the Interstate Highway System (80,000 lbs) and local roads with special designation. If necessary, permits for GVWs over 110,000 lbs are issued by the states of Utah and Colorado. Generally, roads and bridges in the BDO Zone are in good condition.

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**

3.5.6 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: Some road infrastructure risk is associated with the rated quantity of forest residue. Many of the forest road networks in Utah are known to be difficult to access due to steep mountainous terrain and the prevalence of switchbacks.[17] However, mountains on the Utah side of the BDO Zone have a less pronounced topography, enabling mobile chipping/grinding unit and chip truck 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.	**NN**

[17] See Summit County, UT BDO Zone Rating

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**

3.5.7 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: Transportation redundancy in the region is relatively low due to the low annual throughput of roundwood and residue. Logging truck services can be difficult to acquire during some periods of the year. Risk is reduced by the modest cost of purchasing or leasing the additional trucks and trailers that would be required to secure the rated quantities of feedstock.

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

3.6 Risk Factor: Supply Chain Resiliency

3.6.1 Size, Number, and Location of Suppliers

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

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

Risk Information: There are at least three logging contractors in the region that are capable of supplying a new bio-project. Dedicated chipping/grinding crews do not currently operate in the BDO Zone. There is therefore some risk related to the number of potential suppliers, but this risk is moderated by the low rated quantity.

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

3.6.2 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: Logging contractors supplying a new bio-project in San Juan County, UT, will generally avoid external risks related to lumber markets if a new project proponent successfully bids on timber sales offered in the southern portion of the Manti-La Sal NF. All of the roundwood available from timber sales in this area will likely be available to the new bio-project due to the long transportation distance to wood processing facilities in Colorado. However, there is risk that wood supplies from the section of the Manti-La Sal NF to the north of Monticello could become subject to the demands of Colorado-based facilities, as they have procured wood fiber from state trust lands in this area in recent years. Pulpwood and forest residue supplies from the western extent of the San Juan NF will also be dependent on sawtimber demand in Colorado.

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)* 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 64 out of 100.	**Score** **64**

3.6.3 Land Ownership Structures

Rationale: The ownership (or control) of the land base on which feedstock is produced can have a significant impact on the Issuer's feedstock risks. Risk of long-term variation in stumpage cost for wood fiber (i.e., the cost that one pays to a landowner for the right to cut and purchase their wood fiber), for example, is much higher in the US, where >90% of the land is private, and thus stumpage cost is determined on a competitive auction basis. Conversely, in Canada, >90% of the land is owned by the Crown, and stumpage is allocated by the government.

Risk Information: There are no guarantees that timber sales will become available from the portions of the Manti-La Sal NF included within the BDO Zone, which have not been harvested consistently for about a decade. Risk impact is increased to high due to the related scarcity of timber supply in the region and the risk that companies in Colorado could outbid a new project developer. See Risk Indicator 1.3.1 for further details.

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 very high, therefore the RRI is 10 out of 10.	**10**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 80 out of 100.	**80**
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 80 out of 100.	**80**

3.7 Risk Factor: Climate and Natural Risks

3.7.1 Seasonal Weather Impacts on Feedstock Supply

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

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

Risk Information: Forestry and trucking operations occur for 8-10 months in a calendar year. Operations halt during periods of heavy snowfall (e.g., Dec-Feb) and heavy rainfall. Wildfires during the summer months can also lead to operational pauses due to the obligation of logging contractors to support firefighting efforts in the vicinity of their operations. However, large wildfires do not occur on an annual basis.

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

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

3.7.2 Long-Term Weather and Climate Trends

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

Risk Information: The US Southwest is drought-prone and subject to large swings in year-to-year climate extremes. The US EPA notes that wildfires, drought, and pest outbreaks could increase with time if global warming trends continue.[18] Major droughts and flooding events have been common in Utah and Colorado since records began. For instance, multiyear droughts occurred in 1896-1905, 1930-1936, 1953-1965, 1974-1978, 1988-1993, and 1999-2002, and major floods occurred in 1952, 1965, 1966, 1983, and 1984. Members of the US Geological Survey (USGS) note that risk of wildfire and water shortage (drought) become heightened over time due to population growth.[19] While there is significant risk of climate change over longer time periods, the risk of long-term weather and climate trends over the lifespan of a typical bio-project are not significant.

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

3.7.3 Forest/Crop Fire

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

[18] https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-ut.pdf
[19] https://pubs.usgs.gov/fs/fs-037-03/

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

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

Risk Information: The hot and dry conditions characteristic of the American Southwest increase wildfire risk. The last major fire to affect the San Juan NF was in 2018, burning 570,000 acres.[20] By comparison, the forested area within the BDO Zone is less than 150,000 acres. Continued wildfire activity in the BDO Zone can be expected and may impact forestry supply chains for prolonged periods.

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**

3.7.4 Risk of Infestation

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

Since forest insect populations are influenced by environmental conditions, future changes in climate can be expected to significantly alter the outbreak dynamics of certain forest insect species. In some cases, larger and more frequent insect outbreaks may occur, but in other cases, recurring outbreaks may be disrupted or diminished. As the climate continues to change, we can expect more situations, particularly at the margins of tree ranges, where sub-optimal conditions for tree growth and reduced tree vigor can lead to outbreaks of forest insects.

Risk Information: The mountain pine beetle (MPB) outbreak that has led to the loss of pine forests throughout central and northern Colorado since the 1990s has not affected stands in southwest Colorado to the same extent. Roundheaded boring beetles and spruce beetles have affected tree mortality in the area but this has not significantly impacted forest

[20] The 416 and Burro Fire Complex.

management practices. However, over the lifespan of a bio-project, insect-induced mortality could present significant risks to feedstock supply and pricing given the history of MPB infestation in the region and the limited extent of forest.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch**
RRL Mitigation (Notch) **NN**
No adjustment.
RRI Mitigation (Notch)
No adjustment.
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

3.7.5 Risk of Hail

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

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

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

3.7.6 Risk of Flood

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

Risk Information: Flooding does not typically affect forest operations in southeast Utah and southwest Colorado. Wood supply disruptions caused by flooding events are likely to be localized and temporary.

Raw Risk Likelihood (RRL) **Score**

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**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**

3.7.7 Risk of Drought

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

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

Risk Information: As discussed in Risk Indicator 3.7.2, droughts could increase under continued global warming. Prolonged droughts increase susceptibility to wildfire and insect infestation. Note that trees that succumb to drought-induced mortality can still be used for solid wood product manufacturing, combustion applications, and advanced bioproducts.

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**

3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds

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

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

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

Risk Information: Wind events are unlikely to affect future wood supply in the area.

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**

3.7.9 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: Temperatures occasionally drop below 40 degrees Fahrenheit in the winter months. This can lead to operational pauses. However, this is infrequent. Colder weather also has benefits in terms of soil stability and resilience to damage from heavy forestry equipment.

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)*	**Notch** **NN**

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

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: While wood processing facilities in the region generate stable year-to-year demand for sawtimber, the proportion of harvesting that depends on government funds is expected to increase in future years. This is due to the declining availability of suitably stocked stands and the increasing prevalence of alternative non-timber forestry objectives, including wildfire mitigation, watershed protection, and ecological restoration. USFS programs offer subsidies to support biomass recovery and associated forest operations in situations where sawtimber stocking or distance to markets renders operations unprofitable. These include stewardship contracts, integrated resource service contracts (IRSCs), and related programs (Good Neighbor Authority). USFS funds available for such programs are subject to significant interannual volatility.[21]

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

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

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

If biomass utilization requires specific permits (e.g., percentage removal of forest residues or corn stover, allowable cut limits, air emission, storage permits, rights-of-way, overweight permits for trucks, cross-border permitting for shipment

[21] https://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43872.pdf

of biomass, chain of custody, or certification of sustainability), the likelihood of obtaining such permits and/or complying with permitting requirements should be examined.

Risk Information: As noted in Risk Indicator 3.8.1, regional wood supply may become more dependent on government subsidies and programs if the availability of suitably stocked sawtimber stands declines. With regards to regulations and permitting, requirements for cultural surveys under the Antiquities Act could also delay operations, although this is not likely to have a major impact on year-to-year wood supply. Cultural surveys are mandatory on all Utah trust lands and those costs are passed on to the purchaser. Other overarching regulations and permitting requirements, such as environmental impact assessments required under the National Environmental Protection Act (NEPA), are not likely to negatively affect future wood supply.

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

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

Rationale: Public backlash against biomass development in the Issuer BDO Zone can directly impact the Issuer's ability to procure, transport, trans-load, store, or utilize feedstock by affecting local policies, regulations, and the Issuer's ability to obtain necessary permitting.

Risk Information: Organizations in the region have been known to be opposed to the forest industry and related activities. The San Juan Citizens' Alliance recently sued the USFS for a proposed 23,000-acre timber sale in southwest Colorado (lawsuit ongoing).[22] Treatments of pinyon-juniper woodlands by the Bureau of Land Management (BLM) have also been met with criticism in Utah, and this could extend to any forest operations planned in the southern portion of the Manti-La Sal NF. We were unable to identify any citizen groups present in the region that actively support the mechanical treatment of woodlands and forests.

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**

[22] https://www.sanjuancitizens.org/press-release/press-release-lawsuit-targets-timber-sale-threatening-rare-mature-forests

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**

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: The Bears Ears National Monument is co-managed by a coalition of tribes that have ancestral ties to the region. Harvesting on the portion of the Manti-La Sal NF that falls within the Monument is possible but less likely. Pinyon-juniper woodlands are valued by the Navajo and other tribes and, in consideration of the low quantity available and the history of public opposition to PJ harvesting in the region, were therefore not considered in the present rating.

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**

3.8.5 Food Security Concerns

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

Risk Information: Not relevant.

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

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

3.9 Risk Factor: Sustainability and Environmental Concern

3.9.1 Feedstock Sustainability

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

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

Risk Information: Sustainability assurances are provided by the USFS forest planning process, which includes forest inventory, growth and yield projections, and wildlife population assessments, among other attributes relevant to sustainability. Additionally, environmental impact assessments must be completed under NEPA regulations before timber sales are offered. These factors reduce the likelihood of public opposition.

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.	**NN**
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**

3.9.2 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: Not relevant.

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

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

3.9.3 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: Not relevant.

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

3.9.4 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: Not relevant.

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

3.9.5 Pesticide Risk to Human and Ecosystem Health

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

Risk Information: Not relevant.

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

3.9.6 Risk to Wildlife and Landscape

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

Risk Information: All forestry activity in the USFS National Forest System requires pre-approval under the National Environmental Protection Act (NEPA). Wildlife surveys and risk assessments are standard for NEPA approval. The presence of threatened or endangered wildlife generally does not impact timber sales and forest 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**

3.9.7 Biomass Classified as Genetically Modified Organism (GMO)

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

Risk Information: Not relevant.

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

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

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: We anticipate minimal risk to feedstock quality based on the rated quantities. Regional operators are familiar with best practices for managing and storing wood fiber. Dry regional conditions naturally reduce the moisture content of woody biomass.

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 8 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 8 out of 100.	**Score** **8**

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: Logging trucks can be difficult to schedule, as capacity tends to be controlled by the larger wood processing facilities. However, the rated quantity of feedstock would require only 1-2 trucks. A single mobile comminution unit-chip truck tandem would also likely need to be established to ensure delivery of the rated quantity of forest residue. Overall, risk of scale-up is reduced due to the low rated quantity.

Raw Risk Likelihood (RRL)	**Score**

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**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**

CATEGORY 5.0: INFRASTRUCTURE RISKS

5.1 Risk Factor: Physical Infrastructure

5.1.1 Land Parcel/Industrial District

Risk Information: There are three industrial parcels highlighted in this report; all are less than a mile east of Monticello, UT. See Sections C and E for site maps and details.

Site 1: 20 acres of greenfield development. Utilities along the southern border.

Site 2: 8 acres of greenfield development. Located adjacent to Site 1.

Site 3: 3 acres of greenfield development. Located adjacent to the Rocky Mountain Power substation.

All three sites have industrial zoning and primary utilities are available. Parcel size variation among the three sites opens options for new bio-industries.

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: Sites 1 and 2 are owned by San Juan County. Site 3 is owned by the City of Monticello. Local government control allows for a streamlined and consistent approach to land transactions, reducing potential complications and ensuring that businesses can secure the property they need with greater ease and reliability.

This arrangement is beneficial for new and developing industries, as it simplifies negotiations and provides a clear framework for land acquisition, contributing to a more efficient set-up process within 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**

5.1.3 Permitting Description

Risk Information: The San Juan County Building Department in Monticello provides an efficient, business-friendly approach to construction and environmental permitting for new industries. Non-hazardous permits for air, water, and general operations are typically processed within 3 to 6 months, though many are completed in as little as 30 to 60 days. This streamlined process helps businesses establish operations promptly, aligning well with tight project timelines.

The three industrial parcels in San Juan County are located in air attainment zones, meaning there are no strict air quality restrictions. However, emissions must still be monitored and reported to the Environmental Protection Agency (EPA), ensuring compliance with environmental standards. This balanced approach—allowing quick permit acquisition while upholding regulatory oversight—makes San Juan County an attractive location for industries seeking both speed and environmental compliance in their setup.

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

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

5.1.4 Environmental Issues

Risk Information: San Juan County faces increasing water scarcity, exacerbated by climate change and declining Colorado River flows. This poses significant risks for water-intensive industries, which may be subject to usage restrictions and potential shortages. The availability of sustainable water resources will be a critical factor, and thorough water use assessments are essential for new developments.

The county also bears a legacy of uranium mining, with contamination risks from radioactive waste, particularly in areas like the Navajo Nation. Within a 25-mile radius of Monticello industrial sites, six active or abandoned uranium mines are present, heightening environmental concerns. Future industrial projects will likely need geological and environmental assessments to address contamination risks and ensure compliance with safety standards.

The highlighted industrial sites have no specific environmental concerns that would restrict building and operations. except those mentioned above. The drought issue is the cause for the high-risk rating.

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)* 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 64 out of 100.	**Score** **64**

5.2 Risk Factor: Utilities

5.2.1 Natural Gas Availability

Risk Information The natural gas industry in Utah is growing, partly because the electric power sector is transitioning away from coal. Utah ranked tenth in the nation in natural gas production in 2020.[23] Of the natural gas consumed in Utah in 2022, the residential sector used 35%, electric power generation used 25%, the commercial sector used 21%, and the industrial sector used 19%.[24] The price of natural gas in Utah remains low compared to the rest of the nation,

[23] https://www.eia.gov/dnav/ng/hist/n3035ut3m.htm
[24] Ibid.

with commercial natural gas costing an average of $8.55 per thousand cubic feet in 2023.[25] The average natural gas price in the US in July 2024 was $10.05/Mcf.[26]

The industrial sites do not have direct access to natural gas. These would require some installation of pipelines, possibly as much as ½ mile. This is a medium risk for a new development

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**

5.2.2 Electric Availability

Risk Information: Monticello's local electricity is provided by Empire Electric, a cooperative association. Cooperative utilities, such as Empire, typically prioritize service reliability and cost stability for members, which is advantageous for industries requiring consistent power. Most of Utah is serviced by Rocky Mountain Power (RMP), which sources electricity from a diverse set of facilities across multiple states. This interconnected system offers greater grid stability and flexibility for customers, benefiting the region by sharing power resources from nearby states.As of September 2024, Utah's residential electricity rate is the second lowest in the US (behind Louisiana) at 10.41 cents/KWh.[27] which is among the lowest in the United States. This affordability offers a competitive advantage, especially in contrast to higher rates in states like California (17.05 cents/kWh) and New York (19.46 cents/kWh), [28] making it particularly attractive for both households and cost-sensitive industries.

For new industries, Empire Electric's cooperative structure and RMP's cross-state network provide robust infrastructure and stability. The three industrial sites all have existing electric power infrastructure in place.

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**

[25] Ibid.
[26] Ibid.
[27] https://www.chooseenergy.com/electricity-rates-by-state/
[28] Ibid.

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

5.2.3 Water Availability

Risk Information: Groundwater is a primary source of potable water for much of San Juan County, particularly in rural and residential areas where well water is often the only option. Aquifers in this region, while crucial, are finite and vulnerable to depletion and contamination. For surface water, the San Juan River, part of the Colorado River system, provides limited surface water resources. These resources are increasingly strained due to reduced flows from prolonged droughts and lower snowpack levels in the Rockies, compounded by high demand from other users in the Colorado River Basin.

Towns like Monticello and Blanding have municipal water services that provide treated water from groundwater sources. However, these systems are subject to the same limitations on water availability and quality, especially under drought conditions.

Continued investment in water infrastructure, including more efficient distribution and advanced treatment systems, is necessary to maintain potable water availability. New industries and developments in San Juan County may need to support these upgrades as part of sustainable growth strategies.

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**

5.2.4 Waste Disposal

Monticello City Services provides both potable water and wastewater management for industrial sites, ensuring consistent and reliable service for new industries. This municipal support makes water and wastewater a low-risk item, streamlining the setup for businesses that require dependable water access and waste disposal. The City's

infrastructure includes both a potable water supply and an established wastewater treatment system, reducing the need for industries to independently manage these resources.

For solid waste, the San Juan County Landfill, located approximately 35 miles from Monticello, handles various types of waste, including limited hazardous materials, with advance notice. This proximity offers a manageable option for waste disposal and is advantageous for industries needing to dispose of both standard and, on occasion, specific hazardous waste, ensuring compliance with regulatory requirements.

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

5.2.5 Internet Availability

Risk Information: The average monthly cost of an internet plan in Utah is $50.81,[29] making it the second most affordable state in the US. HughesNet Communications provides wireless service in the Monticello area and fiber optics are readily available for both residential and commercial/industrial customers.

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**

[29] https://www.highspeedinternet.com/view-plans

5.3 Risk Factor: Transportation/Logistics

5.3.1 Road/Highway Access

Risk Information: U.S. Route 191 is the primary north-south route connecting Monticello to Moab in the north and to Arizona in the south. It is a vital route for moving goods and accessing regional resources, providing connections to I-70, which links to major cities and transportation networks across the country. Extending southwest from Monticello, U.S. 491 provides a route toward Colorado and New Mexico, connecting with cities like Cortez, CO, and Gallup, NM. This route is significant for regional commerce and provides an additional link to other major transportation corridors.

Interstate I-70 is approximately an hour's drive north, accessible via U.S. 191. I-70 is a crucial east-west interstate, providing efficient travel to larger markets, distribution hubs, and other interstate connections in Utah, Colorado, and beyond.

Monticello's road access provides sufficient logistical support for new industrial activities, with established routes ensuring reliable connections to key markets and transportation infrastructure.

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**

5.3.2 Rail Access

Risk Information San Juan County, Utah, lacks direct railroad access, which poses challenges for industries that rely on rail for transporting goods or raw materials. There are no major rail lines passing through the county, making it difficult for businesses to leverage the cost advantages and logistical efficiency that rail transport can offer.

The Union Pacific Railroad does cross through Utah, but its lines primarily run north of San Juan County, serving more central and northern regions of the state. The nearest significant rail access point is approximately 100 miles north in Green River, UT, where the California Zephyr passes through. However, the California Zephyr is an Amtrak passenger train, not a freight service, so it does not offer commercial logistics options for businesses in San Juan County. For freight rail access, companies in the County would need to connect with Union Pacific's freight network via transloading facilities located further north, such as in Price, UT or Helper, UT.

The absence of rail service in San Juan County increases transportation costs and logistical challenges for industries that typically benefit from rail freight. This can limit the attractiveness of the county for certain types of industries, particularly those involved in heavy manufacturing, mining, or bio-economy sectors that move large volumes of materials.

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**

5.3.3 Airport Access

Risk Information: San Juan County, Utah, has a few small regional airports, but there is no commercial jet service available directly within the county. Monticello Airport is a small general aviation airfield 5 miles north of the city, primarily serving private pilots and light aircraft. This airport can handle small business jets, but its facilities are limited in terms of size, services, and infrastructure. It is not designed for regular commercial or large corporate jet operations.

For commercial flights, residents and businesses typically rely on Canyonlands Field Airport (CNY) near Moab, about 1.5 to 2 hours away by car. Canyonlands offers limited regional commercial flights, often connecting to Salt Lake City or Denver. Larger airports, such as Salt Lake City International Airport (SLC) or Albuquerque International Sunport (ABQ), are much farther away, requiring a 5- to 6-hour drive.

The lack of commercial jet service and limited airport infrastructure creates a moderate to high-risk situation for businesses that need frequent air travel for employees or clients. It could pose challenges for recruiting and retaining employees, particularly those who travel frequently or expect quick access to major airports. This is especially important for industries requiring the regular transport of personnel, high-level executives, or specialized contractors

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)* 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 64 out of 100.	**Score** **64**

5.3.4 Water Freight Access

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

5.4 Risk Factor: Social Infrastructure

5.4.1 Healthcare (Local)

Risk Information: San Juan Hospital, a 20-bed Critical Access facility in Monticello, provides essential healthcare services, including emergency and surgical care. The hospital also operates a Monday-to-Friday Urgent Care center staffed by 12 doctors, supporting the region's healthcare needs. For new employees, this nearby healthcare access presents a low-risk factor, ensuring prompt medical attention and general health services within the community.

This level of care enhances Monticello's attractiveness to industries considering employee well-being, as it helps provide accessible, reliable healthcare close to both residential and industrial areas.

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

5.4.2 Education (Schools)

Risk Information: The San Juan School District, serving approximately 3,000 students across 13 schools in the Monticello area, provides a strong educational foundation for families and supports workforce development. With a variety of primary, middle, and high schools, the district emphasizes academic achievement, extracurricular activities,

and programs that support diverse learning needs. This educational system supports community growth by preparing students for both college and career paths.

Adding to local educational resources, Utah State University (USU) has an extension campus in Monticello, which is an asset for both residents and new industries. The USU extension offers extensive vocational training and professional programs. These programs ensure a steady flow of skilled graduates, helping local industries meet their workforce needs with well-trained, locally sourced talent.

Overall, the San Juan School District and USU's presence in Monticello create an attractive environment for new industries, supporting employee families and contributing to a skilled labor pool in the region.

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

5.4.3 Local Transportation

Risk Information: Monticello, UT, being a small rural town, has very limited local transportation options. The town lacks a public transportation system, meaning most residents rely on personal vehicles to get around. There are no fixed bus routes, and taxi and ride-sharing services like Uber or Lyft are not readily available.

For businesses considering Monticello as a location, this transportation limitation may affect workforce mobility, particularly for industries requiring a larger or diverse labor pool. Companies might need to offer transportation solutions, such as carpools or shuttle services, to ensure employees can reliably get to work. Without these options, attracting workers from nearby towns or more distant areas could be a challenge, potentially limiting the labor market for growing industries.

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

5.4.4 Public Safety (Local)

Risk Information: San Juan, UT County has a lower crime rate compared to the national average. The county's violent crime rate is 12.8,[30] which is significantly lower than the US average of 22.7. However, the property crime rate in the county (35.4) is slightly higher than the national average (30.1).

Public safety in the county is managed by several agencies, including the San Juan County Sheriff's Department, which serves the entire county, including unincorporated areas and small towns like Monticello and Blanding. The sheriff's department handles most law enforcement duties, emergency response, and countywide crime prevention.

In addition to the sheriff's department, Monticello and Blanding each have small police departments that focus on local policing, ensuring safety within town limits. Their responsibilities include community policing, traffic control, and responding to minor crimes and disturbances.

In summary, San Juan County offers a safe environment for families, with well-functioning law enforcement agencies and relatively low crime rates.

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**

5.4.5 Housing/Cost of Living

Risk Information: San Juan County, Utah, presents a compelling location with a cost-of-living index at 86.2,[31] well below the averages for the United States (100) and Utah (93.0). Housing costs, with median home prices at around $309,000,[32] are particularly attractive. For those renting, a typical three-bedroom, two-bath apartment costs about $1,025 per month, making housing affordable in smaller towns like Monticello and Blanding.

[30] https://www.bestplaces.net/crime/county/utah/san_juan
[31] https://www.realtor.com/realestateandhomes-search/Monticello_UT/overview
[32] Ibid.

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**

5.5 Risk Factor: Labor

5.5.1 Workforce

Risk Information: As of September 2024, the unemployment rate in San Juan County, Utah is 4.7%.[33] The unemployment rate in Utah as a whole is 3.5%, indicating a healthy job market. This relatively low rate suggests that most individuals seeking employment are finding opportunities, contributing to a stable economic environment. The county has over 4,500 nonfarm jobs,[34] demonstrating a year-over-year increase of 2.8%. This growth indicates a positive trend in job creation, reflecting the county's potential for attracting new businesses and industries.

Mining is increasingly becoming a significant part of the local economy. As this sector grows, it not only generates direct employment opportunities but also stimulates ancillary industries such as transportation, equipment manufacturing, and environmental management. The demand for skilled workers in geology, engineering, and other related fields is likely to increase, enhancing the local labor pool's capabilities.

The presence of educational institutions, such as the San Juan School District and the Utah State University extension campus, contributes to workforce development by offering vocational training and higher education opportunities. These institutions help prepare the local population for various careers, particularly in technical fields aligned with emerging industries.

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.	**Notch** **NN**

[33] https://jobs.utah.gov/wi/data/library/employment/countyunemployment.html
[34] Ibid.

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 16 out of 100.	**Score** **16**

5.5.2 Labor Costs

Risk Information: The minimum wage in San Juan County is $7.25 per hour, which aligns with the federal minimum wage and is consistent with most states. This wage level provides a baseline for entry-level positions but may not reflect the actual average earnings for most workers in the area.

The average household income in San Juan County is approximately $3,545 per month, which translates to about $48,836 annually.[35] This figure represents a 7.5% increase over the previous year, indicating positive economic growth and potentially higher income opportunities for residents. This positive trajectory indicates that many residents are likely earning more than the minimum wage, supported by local industry growth, which bodes well for the overall economic health of the county and its attractiveness to new businesses.

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**

[35] https://www.ziprecruiter.com/Salaries/-in-Monticello,UT

SECTION E: TABLES AND FIGURES

Figure E-1. Sawtimber volume sold and cut, San Juan National Forest, 2014-2023

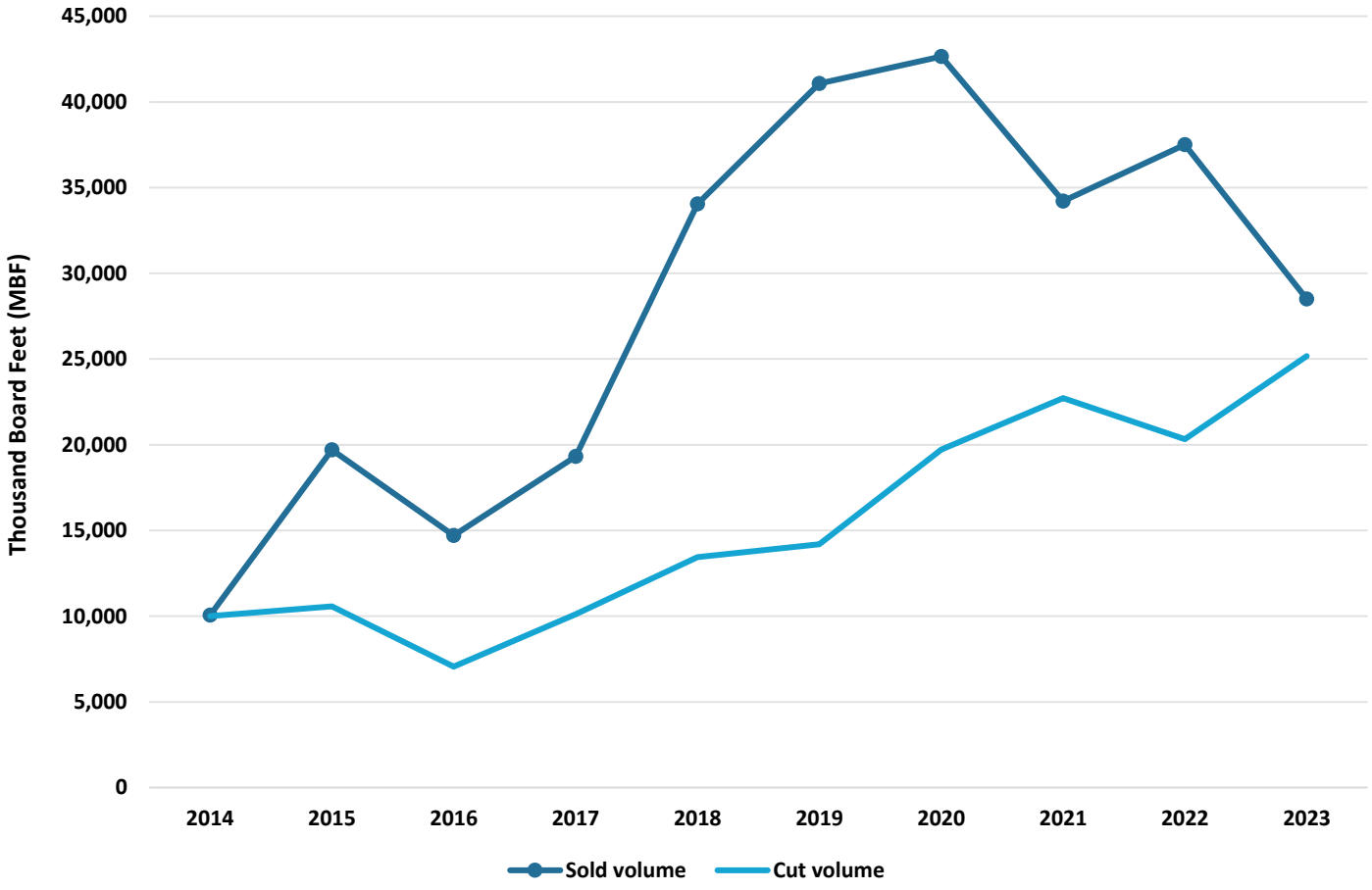


Figure E-2. Comparison of diesel prices in the Rocky Mountain Region and the USA, 1995-2023

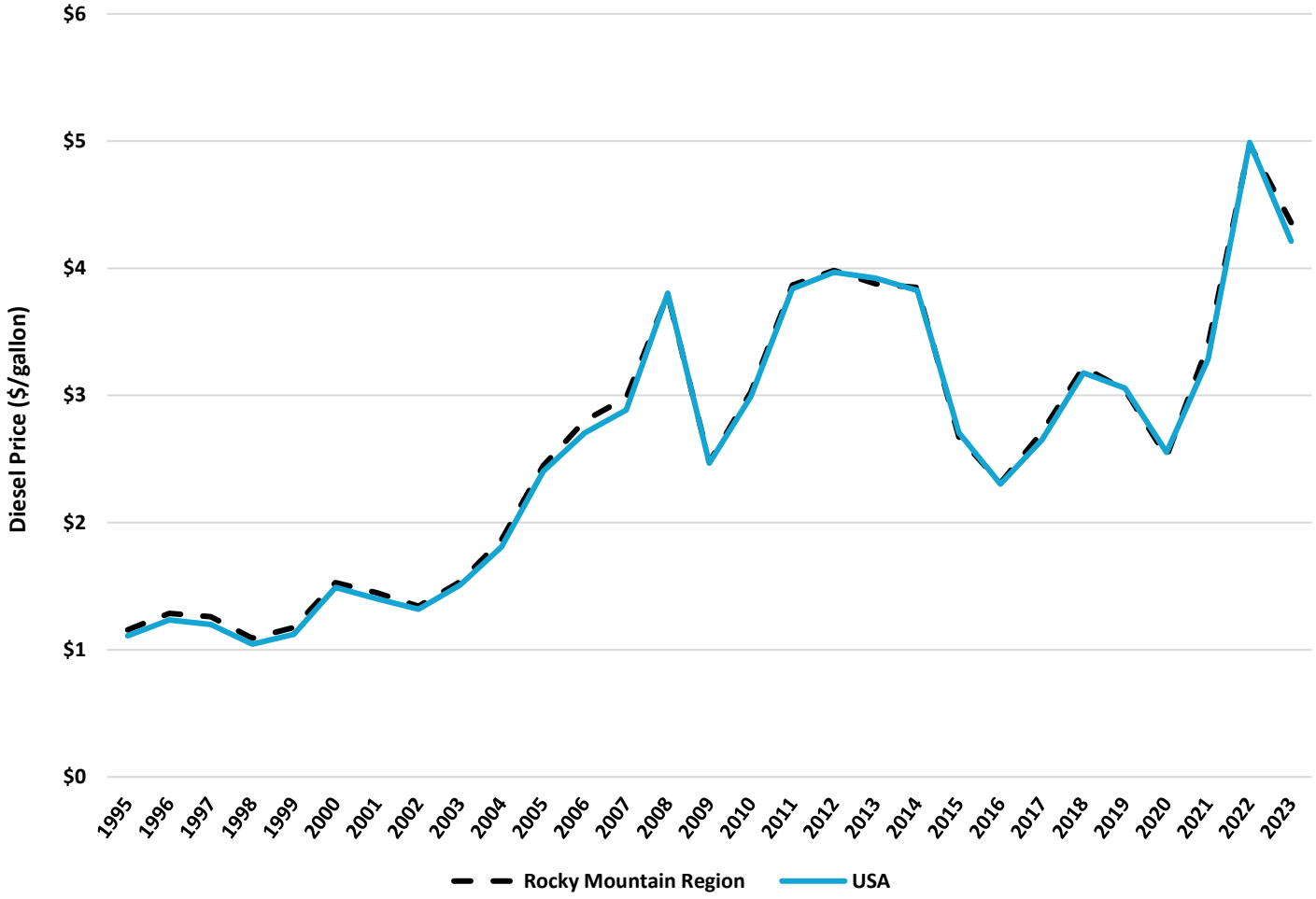


Figure E-3. Inflation-adjusted diesel prices in the Rocky Mountain Region, 1995-2023

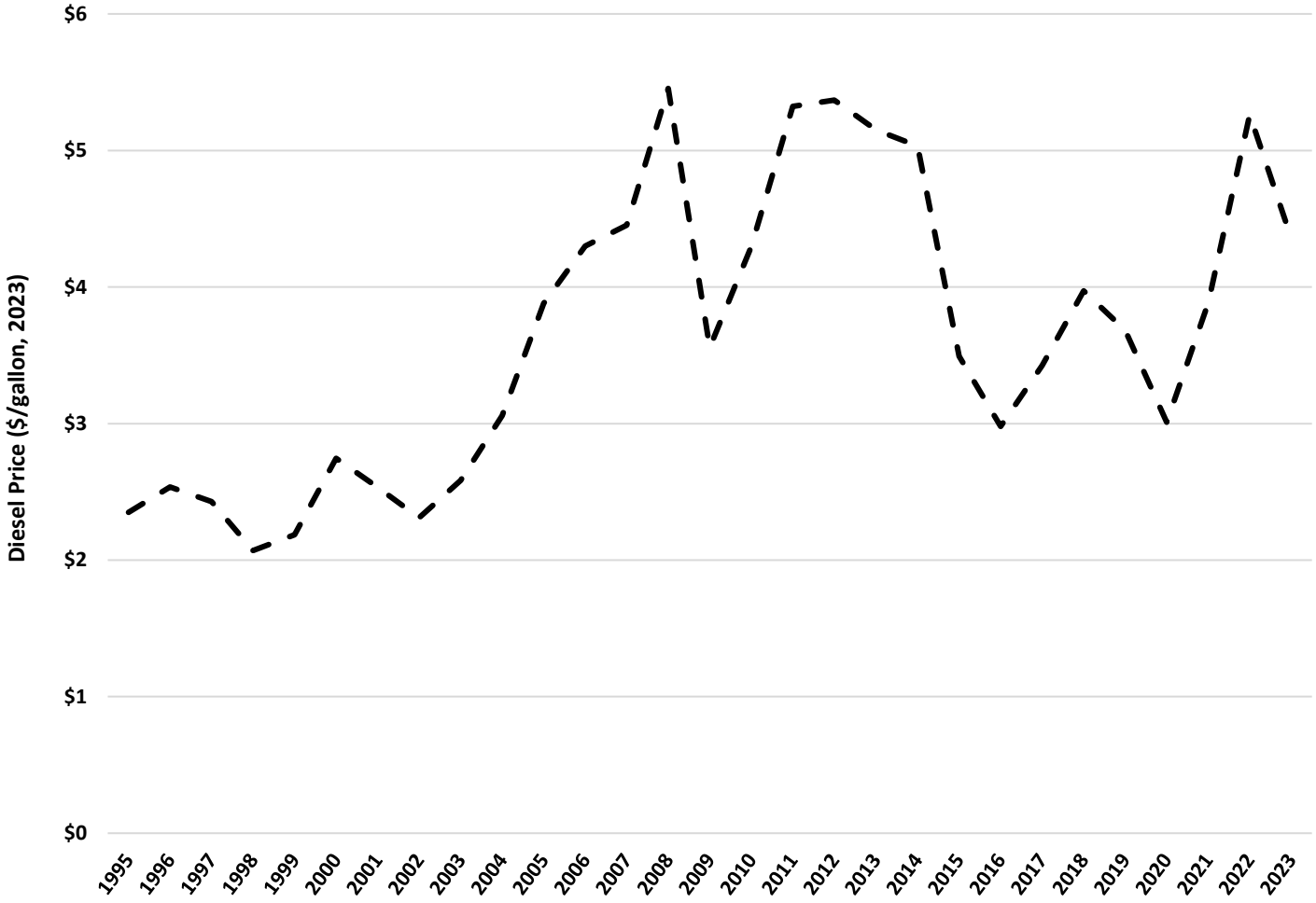


Figure E-4. Location of San Juan County, Utah



Figure E-5. Three Industrial Sites – Monticello, UT



Figure E-6. 20- and 8-Acre Industrial Site – Monticello, UT



Figure E-7. 3-Acre Industrial Site – Monticello, UT



SECTION F: LEGAL DISCLAIMER

This BDO Zone Rating (the "Rating") is prepared for and provided to the Southeastern Utah Association of Local Governments (SEUALG) and is intended to be read and used in its entirety and not in parts. Separation or alteration of any section or page from the main body of this Rating is expressly forbidden. In preparing this Rating, Ecostrat has used information obtained from third parties or otherwise publicly available. All such information has not been independently validated, verified, or confirmed by Ecostrat (except where otherwise specifically indicated) and Ecostrat makes no representation or warranty as to the accuracy or completeness of any information provided by third parties or otherwise publicly available.

Neither Ecostrat nor the members of the BDO Zone Advisory Committee make any representation or warranty as to the accuracy or completeness of the information and content in this Rating and shall have and accept no liability for any statements, opinions, information, or matters (expressed or implied) arising out of, contained in or derived from this Rating or any omissions from this Rating, or any other written or oral communication transmitted or made available to any other party in relation to the subject matter of this Rating. Any use which a third party makes of this Rating, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Decisions made, or actions taken based on or resulting from Ecostrat's work product shall be the responsibility of the parties directly involved in those decisions or actions. There are no third-party beneficiaries with respect to this Rating, and Ecostrat expressly disclaims any liability whatsoever (whether in contract, tort, or otherwise) to any third party. Ecostrat makes no representation or warranty (express or implied) to any third party in relation to this Rating. A decision by any entity to disclose this Rating to the public or privately to a limited number of potential institutional accredited investors or other qualified investors shall not constitute any permission, waiver, or consent from Ecostrat for any third party to rely on this Rating except for informational purposes, and as such, is provided on such basis. Access to this Rating and its use by any third party implies acceptance by the third party of the terms and conditions contained in this section and other parts of this Rating.

All information included is based on information available on the date hereof and neither Ecostrat nor the members of the BDO Zone Advisory Committee are under any obligation to update the information herein. No investor, security holder, or other person should rely on the content of this report in any way in connection with the purchase or sale of any security.