# WESTERN JUNIPER REMOVAL AND VALUE-ADDED PROCESSING FEASIBILITY STUDY

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# **INTRODUCTION**

The Ritter Land Management Team (RLMT) is considering the establishment of a Western Juniper (WJ) removal and processing enterprise. In order to effectively develop and deploy this enterprise, RLMT and the Oregon Business Development Department have asked TSS to provide a feasibility study report that addresses the following:

- Capital investment and operations/maintenance expense analysis for a WJ removal enterprise.
- Capital investment and operations/maintenance expense analysis for a WJ value-added processing enterprise.
- Recommendations regarding potential siting locations for the value-added processing enterprise within the Ritter, Oregon area.
- Observations regarding opportunities to merge WJ product marketing efforts with other WJ processing enterprises.
- Recommendations regarding the optimized business structure for the RLMT supported enterprise(s).

In addition to addressing the items listed above, this feasibility study summarizes findings from recent reports issued by TSS Consultants (TSS) addressing:

- > Ritter area WJ timber and fiber supply assessment.
- ➢ WJ product market analysis.

# **INVESTMENT ANALYSIS – WJ REMOVAL ENTERPRISE**

WJ removal operations require significant investment in specialized equipment to facilitate harvest, collection and transport of WJ logs. On September 16, 2016, TSS conducted a field visit to the Ritter area to view WJ vegetation and topography firsthand and complete the WJ timber and fiber assessment (see Appendix A). In addition, TSS was able to assess WJ removal and collection techniques that would best meet RLMT goals and objectives.

#### WJ Removal Equipment Capital Expense

Table 1 is a list of harvest, collection and transport equipment and capital expense estimates, both low-range and high-range. Also summarized in Table 1 is the capital expense investment budget used to conduct the investment analysis.

		CAPITAL		
		INVESTMENT	CAPITAL	
	VENDOR/	LOW/HIGH	INVESTMENT	
EQUIPMENT	MODEL	RANGE	BUDGET	COMMENTS
Chain Saws (5)	Stihl MS 362	\$2,500 – \$4,000	\$3,750	Assumes crew of four sawyers.
Forwarder	Vimek Model 606	\$85,000 - \$130,000	\$97,500	Wide range of vendors, models and options. Most are designed and built in Europe.
Excavator	Kubota KX080	\$90,000 - \$140,000	\$105,000	Use to pre-deck logs (prior to forwarding) and pile limbs/tops for burning.
Self Loading Log Truck	Kenworth with log grapple	\$40,000 - \$120,000	\$45,000	Wide range of vendors, models and options. Suggest short log bunks (12') on the main frame and long log trailer (25').
Crew Transport Truck	Ford F350 diesel	\$20,000 - \$40,000	\$35,000	Crew cab 4x4. Capacity to support 350 gal water tank and diesel fuel tank (to fuel field equipment).
All Terrain Vehicle	Polaris	\$7,000 – \$12,000	\$10,000	Lots of options. Suggest a trailer set up to carry chainsaws and support equipment or to transport small limbs and stems (roundstock ).
Ancillary Equipment		\$10,000 - \$20,000	\$15,000	ODF approved fire tools, safety equipment (chaps, vests, hard hats, etc.) water tank (350 gal), diesel tank, fire hose, fire extinguishers, extra saw chain, etc.
Totals		\$254,500 - \$466,000	\$311,250	

Table 1. WJ Harvest, Collection and Transport Equipment Capital Investment

# WJ Removal Enterprise Operating and Maintenance Expense

The WJ removal enterprise will require a significant investment in operating and maintenance (O&M) expenses. TSS experience and interviews with enterprises actively removing WJ stems were used to forecast annual O&M expenses summarized in Table 2.

COST CENTER	ANNUAL COST	COMMENTS		
Labor	\$192,591	Includes two cutters, two buckers and one equipment operator, with base labor rate of \$18/hour. Total labor costs include workers comp, social security, medicare, training, sickness and vacation.		
Diesel Fuel	\$15,610	Log truck at 5 MPG <sup>1</sup> and one trip/day averaging 30 miles roundtrip. On highway diesel price of \$3.50/gallon. Excavator and forwarder at 2 gallons/hour (each). Off highway diesel at \$3.00/gallon.		
Lubricants	\$1,400	Lubricants for field equipment and hydraulic fluid.		
Liability Insurance	\$9,000	Insurance protection against loss due to a suit of claims.		
Saw gas and oil	\$8,400	10 gallons/day saw fuel and 2 gallons/day bar oil.		
Saw chain	\$1,400	Saw files to sharpen chain and chain replacement.		
Tires	\$7,000	Log truck and forwarder.		
General and Administration	\$10,000	Primarily the bookkeeper.		
Miscellaneous	\$1,400	Hydraulic hoses, spare parts.		
Total	\$246,801			

Table 2. WJ Removal Enterprise Operating and Maintenance Expenses

# **Investment Analysis**

Summarized below are base case assumptions used when conducting the investment analysis for a WJ removal enterprise:

- Minimum 15% IRR (after taxes);
- \$311,250 capital expense;
- \$192,591/year labor cost (five full-time equivalent employees);
- \$54,210/year operations & maintenance cost (not including labor);
- \$5,000 every 5 years major maintenance cost for rolling stock;
- 10-year accelerated tax depreciation schedule;
- No debt;
- 1%/year escalation for labor costs;
- \$65/ton is the WJ sawlogs sales price delivered to the RLMT sawmill site, with stumpage cost at \$0;

<sup>&</sup>lt;sup>1</sup> Miles per gallon.

- 1%/year escalation for sawlog value;
- 1.5 loads of WJ logs delivered per day;
- Each load of WJ logs weighs in at 25 tons (net);
- 140 operating days per year;
- Working capital investment of \$61,000 for first year;
- Internal rate of return is calculated on a 20-year term.

# Findings

Summarized below are the investment analysis findings. A number of investment scenarios were considered including a range of cash grants, delivered log values and WJ removal rates.

CASH GRANT FOR CAPITAL EXPENSES	WJ LOG VALUE (\$/GT DELIVERED TO PROCESSING YARD)	YEAR ONE CASH FLOW AFTER EXPENSES	IRR (Internal Rate of Return %)
\$0	\$65/ton	\$59,000	15%
\$0	\$70/ton	\$75,000	20%
\$113,000	\$60/ton	\$44,000	15%
\$148,000	\$70/ton (reduction in delivery per day to 1.25 loads per day)	\$39,000	15%

 Table 3. Investment Analysis Findings - WJ Removal Enterprise

The hurdle rate for this investment is set at 15% and represents the internal rate of return on investment. A hurdle rate of 15% reflects a risk-adjusted cost of capital that TSS recommends when evaluating a forest processing or harvesting project. The internal rate of return is the interest rate at which the investment cash flow returns a net present value of zero. However, since we are using a hurdle rate of 15%, we require the investment's cash flow to produce at least a 15% rate of return before TSS recommends proceeding with the investment.

Given the base case assumptions for cost and revenue, the internal rate of return for the investment is 15% with an investment of \$311,000 for equipment plus an additional one time investment of \$61,000 for working capital for a total capital commitment of \$372,000. TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT.

The investment analysis model is very sensitive to market price for sawlogs. Currently, we are using \$65 per ton price for sawlogs delivered to the RLMT processing operation, with the assumption that stumpage value is \$0. TSS considers this delivered log price to be representative of current WJ log prices in the region. If priced at \$70 per ton, the internal rate of return increases to 20%. With a cash grant of \$113,000 and a \$60 per ton price, the internal rate of return reaches the hurdle rate of 15%.

TSS also modeled the effect of fewer deliveries to the processing facility. In this scenario, the price of WJ logs is \$70 per ton with 1.25 loads delivered per day. Obtaining a cash grant of

\$148,000 delivers an internal rate of return of 15%. Monthly cash flow forecasts for the first three years of WJ removal operations are included in Appendix C.

A significant risk in this venture is the marketplace. The harvest operation as modeled is entirely dependent on a financially viable buyer that is converting WJ logs into valued commodities. If the processing plant cannot pay a market price for WJ logs, the risk to the harvesting operation is substantial. Also, the rate of production for the WJ removal enterprise is essential to the financial health of the investment. Thus, anything that promotes a consistent production rate is paramount to the operation. A rigorous equipment maintenance program, strategic management of removal operations to assure at least 140 days of annual operation, and having trained personnel will help mitigate issues that may impede or curtail production. Extending the length of harvest season will significantly improve the cash flow and internal rate of return. Regardless of what the marketplace does, production efficiency is one item that is under the control of the WJ removal enterprise.

# INVESTMENT ANALYSIS – WJ VALUE-ADDED PROCESSING ENTERPRISE

Processing of WJ logs is expensive but not as expensive as the WJ removal enterprise. However, the processing enterprise is a critical piece as it creates products that are sold to outside markets, thus creating cash flow that funds procurement of WJ logs. Since there are no WJ processing operations in the region currently procuring logs, the processing enterprise becomes a keystone to the restoration of rangeland within the Ritter area.

# WJ Processing Site Improvement and Capital Investment

As noted in the Siting Analysis section of this report, the Bone Point site is the preferred location for the WJ processing operation. TSS, RLMT and Bates Forest Recovery Inc., provided estimates addressing site improvement and capital investment requirements necessary to locate a WJ processing facility at the Bone Point site. Table 4 summarizes improvements and the capital investment budget.

SITE IMPROVEMENT AND STRUCTURES	CAPITAL INVESTMENT BUDGET	COMMENTS
Electrical	\$4,000	Install power meter and yard light.
Fencing and Gates	\$1,500	Fence the site and add two wire gates.
Office	\$40,000	Shipping container, with toilet facilities and insulated for winter conditions.
Storage Container	\$6,000	Used 40-foot storage container for tools, maintenance items and shop.
Water	\$3,000	Install water service from pump house to office.
Culverts	\$3,850	Cost to purchase and install 18" culverts at entrance and exit to site.
Septic	\$10,000	Septic system installation.
Grading, Road Improvement and Drainage	\$34,000	Grading and installation of rock base on roads (entrance and exit) and three acres on site (operations and log storage).
Contingency at 5%	\$5,118	
Total	\$107,468	

# Table 4. WJ Processing Site Improvement Detailed Cost Estimate

# WJ Processing Equipment Capital Expense

Table 5 is a list of equipment and capital expenses with both low-range and high-range estimates. Also summarized in Table 5 is the capital expense investment budget used to conduct the investment analysis.

EQUIPMENT	VENDOR /MODEL	CAPITAL INVESTMENT LOW/HIGH RANGE	CAPITAL INVESTMENT BUDGET	COMMENTS
Portable Sawmill	Timber King TL 2200	\$50,000 - \$80,000	\$60,000	New Timber King sawmill with Kubota diesel engine and extra saw bands.
Skid Steer	Bobcat	\$15,000 - \$50,000	\$37,500	To sort and stockpile logs and feed the sawmill.
Fork Lift	Toyota	\$12,000 - \$25,000	\$18,750	To move units around yard and load out trucks for delivery to customers.
Banding Equipment	Misc.	\$2,000 - \$4,000	\$3,000	To band units of lumber or sawmill slabs (firewood) for shipment.
Chainsaws (2)	Stihl MS 362	\$1,000 - \$2,000	\$1,500	Assumes two new saws with 28" bars.
Crew Cab Pick up	Various	\$10,000 - \$20,000	\$15,000	Used pick up.
Lumber Bunks	Fabricated	\$1,200 - \$2,400	\$1,800	Assumes four lumber cribs.
Ancillary Equipment	Misc.	\$10,000 - \$20,000	\$15,800	Extra saw chain, fire safety equipment, peavys, chaps, etc.
Site Improvements and Structures		\$107,468	\$107,468	See Table 4 for details.
Totals		\$208,668 - \$310,868	\$260,818	

Table 5. WJ Processing Equipment and Site Improvement Capital Investment

# WJ Processing Equipment Operating and Maintenance Expense

TSS interviewed WJ processing enterprises operating in central Oregon to confirm operating and maintenance (O&M) expenses for a WJ processing facility. Table 6 summarizes the results of the interviews.

COST CENTER	ANNUAL COST	COMMENTS	
Labor	\$185,552	Includes lead sawyer at \$20/hour, yard hand at \$15/hour, green chain puller at \$15/hour, log bucker at \$15/hour, and admin at \$15/hour.	
Sawmill Fuel	\$5,760	12 gallons diesel/day at \$3/gallon (off highway diesel).	
Sawmill Bands	\$9,600	4 bands used per day at \$15/band.	
Bobcat and Fork Lift Fuel	\$3,840	8 gallons diesel/day at \$3/gallon (off highway diesel).	
Chainsaw Fuel + Lubricants	\$1,600	1 to 2 gallons of sawmix per day, plus bar oil (for bucking sawlogs).	
Banding	\$2,400	For lumber units and slabwood.	
General and Administration	\$10,000	Primarily the bookkeeper/office manager.	
Liability Insurance	\$9,000	Estimate based on TSS experience.	
Property Lease	\$4,800	Estimate provided by RLMT.	
Legal Fees	\$2,000	Estimate based on TSS experience.	
Property Tax	\$1,042	Based on \$.0097 per \$1,000 value of site improvements.	
Personal Property Tax	\$1,534	\$10 per \$1,000 of valuation.	
Utilities	\$7,300	Power, phone, internet.	
Miscellaneous	\$10,100	Lumber crayons, earplugs, safety equipment.	
Total	\$254,528		

# Table 6. WJ Processing Enterprise Operating and Maintenance Expenses

#### **Investment Analysis**

Summarized below are base case assumptions used when conducting the financial analysis for a WJ processing enterprise:

- Minimum 15% IRR (after taxes);
- \$260,818 (including portable sawmill) capital expense;
- Capital expense includes rolling stock (skid steer and forklift) to be shared with firewood operation;
- \$185,552/year labor cost (four full-time and one part-time equivalent employees);
- \$68,976/year operations & maintenance cost (not including labor);

- \$1,000 per year for major maintenance starting in 2019;
- Sawmill replaced in 2023, major maintenance in 2024 (rolling stock);
- 10-year accelerated tax depreciation schedule;
- No debt;
- 1%/year escalation for sawlogs, 1% for labor costs and 1% for lumber sales;
- \$65/ton for WJ sawlogs;
- 3.3 MBF<sup>2</sup> lumber produced per eight-hour day;
- 528 MBF lumber produced annually;
- 800 units of slabwood and 320 cords sold into local and regional firewood markets;
- 160 operating days per year;
- Working capital is set at \$80,000 in first year.

#### **Product Sales**

Lumber product prices used in the investment analysis reflect current wholesale prices for economy, #2 and better and #1 grade lumber. Slabwood unit sales are based on local sales and firewood sales are based on local firewood sales and sales to wholesalers such as Wilco. Interviews with WJ product manufacturers regarding roundstock (3" to 6" diameter at 6' to 8' length) markets confirmed annual revenue forecast pegged at 15% of the revenue generated for lumber. Primary end use of roundstock is fence posts.

		UNIT	UNIT	\$/UNIT SALES	
PRODUCT	UNITS	PRODUCTION PER DAY	PRODUCTION PER YEAR	FOB YARD	ANNUAL REVENUE
Economy Grade	MBF	0.3	48	\$600	\$28,800
#2 and Better <sup>3</sup>	MBF	3	480	\$1,000	\$480,000
Slabwood	Bundled Units	5	800	\$70	\$56,000
Firewood	Cords	2	320	\$220	\$70,400
Roundstock	Various				\$76,320
Total Product Sales					\$711,520
<b>Product Value</b>	Tons			\$135.53	

# Table 7. Annual WJ Product Sales

 $<sup>^{2}</sup>$  MBF = Thousand board foot measure. One board foot is equal to a board 12" in length, 12" wide, 1" thick.

<sup>&</sup>lt;sup>3</sup> Assumes that #1 grade boards are pulled into separate units, thus improving average sales price for #2 and better to \$1,000/MBF.

# Findings

Summarized in Table 8 are the investment analysis findings without cash grants, with log price adjustment, lumber product price adjustment, and securing a loan.

CASH GRANT FOR CAPITAL EXPENSES	WJ PRODUCT VALUE (\$/TON FOB PROCESSING YARD)	YEAR ONE CASH FLOW AFTER EXPENSES	INTERNAL RATE OF RETURN (IRR %)	COMMENTS
\$0	\$135.53	\$68,000	20%	Base assumptions.
\$0	\$135.53	\$53,000	15%	Increased price of logs to \$70/ton.
\$0	\$130.27	\$52,000	14%	Base assumptions, except #2 and better priced at \$950/MBF.
\$0	\$135.53	55,000	25%	Borrow 20% of capital at 5%.

Table 8. Investment Analysis Findings - WJ Processing Enterprise

Given the base case assumptions for cost and revenue, the internal rate of return for the investment is 20% with an investment of \$260,818 for equipment and site improvements plus an additional one time investment of \$80,000 for working capital for a total capital commitment of \$340,818.

Raising the price of juniper logs to \$70 per ton provides a 15% internal rate of return. A decrease of \$50/MBF for the #2 and better lumber price decreases the financial performance of the WJ processing enterprise to a 14% internal rate of return. To illustrate the effect of borrowing on the internal rate of return, borrowing 20% of the capital requirements at a rate of 5% yields a 25% internal rate of return. Overall, the processing operation appears to be a good investment provided production and marketing targets are met. TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT. Monthly cash flow forecasts for the first three years of WJ processing operations are included in Appendix D.

# VALUE-ADDED PROCESSING FACILITY SITING

Several key property attributes were utilized during the review of potential facility sites.

- Location near county road or highway;
- Water availability;
- Year round access;
- Relatively flat terrain;
- Ease of land use entitlements (zoning and permitting).

## **Candidate Sites Review**

Two candidate sites in Grant County, on or near U.S. Highway 395, were examined per the key attributes noted above. These two sites are referred to as the Junction property site and the Bone Point property site. Both sites are discussed in detail below.

#### Junction Property Site

The Junction site is located at the northeast corner of U.S. Highway 395 (aka Pendleton-John Day Highway) and Grant County Road No. 20 (aka Upper Middle Fork Road) and is approximately 13 miles north of the town of Long Creek. Figure 1 highlights the location of the Junction site.



**Figure 1. Junction Property Candidate Site Location** 

The site is relatively flat and sits on a plateau above the Middle Fork of the John Day River, an Oregon-designated State Scenic Waterway. The aerial image in Figure 2 shows the relative location of the Junction site to the Middle Fork of the John Day River.



Figure 2. Aerial Image of Junction Property Candidate Site

Nearly all of the subject site property is within one-quarter mile of the northern bank of the river, which will require approval for the wood product processing activities proposed by RLMT. Further discussion of the approval requirements and process is presented below. The Junction property site is further described as Tax Lot 100, of parcel map 08S31E30, as shown in Figure 3.





The Grant County Planning Department has designated this tax lot (and surrounding tax lots) to be in the Multiple Use Range Zone, MUR-160(320).<sup>4</sup> Per Section 66.010 of the Grant County Development Code,<sup>5</sup> the Multiple Use Range (MUR) Zone is applied to those agricultural and agricultural/low or nonproductive forest lands of the County dominated by and managed primarily for range and grazing uses, and to establish criteria and standards for applicable farm and/or forest uses and related and supportive uses deemed appropriate and necessary.

Within the MUR Zone, there are Outright Uses, Permitted Uses, Administrative Permit Uses, and Conditional Uses. In review of the potential MUR Zone uses, it is noted that Article 66.040 (Administrative Permit Uses), specifically Subsection D, allows a facility for the primary processing of forest products (see Appendix E for Article 66 of the Grant County Development Code). However, the intent is to use portable equipment. Grant County confirmed that the permit approval permit period is one year, which can be renewed. To confirm TSS interpretation of Article 66.040 D, discussions were held with the Grant County Planning Director. The Director confirmed that 66.040 D did allow projects of the type described in this report. The permit could be renewed yearly with the submittal of a letter from the permit holder describing the need for continued operations at the site.<sup>6</sup>

Per the Administrative Permit Use process, the project applicant will submit a Type II application (see Appendix F). This Type II process will require a completed application with an appropriate fee and attachments describing the project and how it will meet the criteria in the Land Development Code. Notice to neighboring property owners and interested governmental agencies (e.g., Oregon Parks and Recreation Department) is required. Additionally, a hearing with the Planning Commission may be required depending on the specific nature of the request.

As mentioned above, the Junction property is located within the Middle Fork of the John Day River Scenic Waterway corridor. As such, the Oregon Parks and Recreation Department (OPRD) must be notified in writing of certain activities proposed within a 1/4 mile of the bank of Oregon's designated scenic waterways. Such activities include cutting of trees, mining, construction of roads, railroads, utilities, buildings, or other structures. The proposed uses or activities may not commence until the written notification is approved or until one year after the notice is accepted.

There are several Oregon Administrative Rules (OAR) that apply to the Middle Fork of the John Day River Scenic Waterway and specifically to the Scenic River Area of the Junction property site. The principal rule is that any new facilities shall be substantially screened by topography or vegetation. Topographical screening appears to be feasible for any new facilities placed on the Junction property site, particularly if the operation was located on the northern portion of the property.

<sup>&</sup>lt;sup>4</sup> Personal communication with Hilary McNary, Grant County Planning Director, January 23, 2017.

<sup>&</sup>lt;sup>5</sup> Grant County Development Code, Chapter 6 – Land Use Zones, <u>http://www.gcoregonlive2.com/pdf/Chapter\_6.pdf</u>

<sup>&</sup>lt;sup>6</sup> Personal communication with Hilary McNary, Grant County Planning Director, January 23, 2017.

TSS discussed the Junction site with representatives of OPRD and submitted the tax lot parcel map for them to review.<sup>7</sup> Their analyses of the required rules and conditions for the proposed facility are attached in Appendix G.

#### Bone Point Property Site

The Bone Point site is located near the southeast corner of Bone Point Road and School House Road, approximately three-quarters of a mile north northeast of the community of Ritter. The site is approximately 21 road miles north of the town of Long Creek.

The Bone Point site is relatively flat and easily accessible from either road. Figure 4 shows the Bone Point site location.



Figure 4. Bone Point Property Site Location

Figure 5 shows an aerial view of the site and immediate surroundings.

<sup>&</sup>lt;sup>7</sup> Personal communications with Jean Jancatis, Natural Resource Specialist, Oregon Parks and Recreation Department, January 2017.



Figure 5. Aerial Image of Bone Point Property Candidate Site

Figures 6 and 7 are photos of the Bone Point site.

Figure 6. Photo of Bone Point Property Candidate Site





Figure 7. Photo of Bone Point Property Candidate Site

The Bone Point property site is further described as Tax Lot 902, of parcel map 08S30E as shown in Figure 8. The Grant County Planning Department has designated this tax lot (and surrounding tax lots) to be in the Multiple Use Range Zone, MUR-160(320).<sup>8</sup> Like the Junction site (Per Section 66.010 of the Grant County Development Code)<sup>9</sup> the MUR Zone applies to those agricultural and agricultural/low or nonproductive forest lands of the County dominated by and managed primarily for range and grazing uses, and to establish criteria and standards for applicable farm and/or forest uses and related and supportive uses deemed appropriate and necessary.

The proposed use will require a Type II Administrative Use Permit as described above for the Junction property site. The Bone Point site is not within a federal or state Scenic Waterway corridor.

<sup>&</sup>lt;sup>8</sup> Personal communication with Hilary McNary, Grant County Planning Director, January 23, 2017.

<sup>&</sup>lt;sup>9</sup> Grant County Development Code, Chapter 6 – Land Use Zones, <u>http://www.gcoregonlive2.com/pdf/Chapter\_6.pdf</u>



Figure 8. Bone Point Property Parcel Map 08S31E30 Tax Lot 902

# **Target Site**

## Key Property Attributes Analyses

Applying the Key Property Attributes as listed previously, the Bone Point site appears to be best suited as the target site for the following reasons.

# Location near county road or highway

The Bone Point site is located near the intersection of two Grant County roads.

# Water availability

Water is available on the Bone Point site.

# Year round access

Principal access to the site is County Road 19, which is maintained by Grant County. During recent (January 2017) snowstorms in the region, County Road 19 appears to have been plowed. The site will require improving entrance and exit access and will also require some grading, rocking and installation of drainage structures (culverts).

# Relatively flat terrain

The Bone Point site is relatively flat. No cut and fill grading is needed.

# Ease of land use entitlements (zoning and permitting)

Both the Junction and Bone Point sites are zoned the same (MUR). For the establishment of a WJ removal and processing facility in the MUR zone, the facility would have to be of a portable

and temporary nature. However, based on discussions with the Grant County Planning Department, they are willing to work with the proposed facility owner so that it can acquire an Administrative Use Permit per the Grant County Development Code. Based on the facility equipment, such as portable sawmill, portable shipping containers for storage and trailer for the office, the facility could meet the County requirements.

The Bone Point site is not within a Scenic Waterway corridor, therefore none of the requirements and land use conditions of the Oregon Parks and Recreation Department apply to the site.

#### Current Status

The proposed location of the facility on the Bone Point property site is currently vacant.

#### Transportation Logistics

As noted earlier, road access to the Bone Point site is via a county maintained road system that is maintained year round. Unlike the Junction site location, the Bone Point site is not situated adjacent to U.S. Highway 395. This will require commercial truck traffic to transport finished product an additional 12 miles (one way). This will not likely add much transport cost for RLMT, especially when considering that the product purchaser typically pays for product transport. The Bone Point site location is closer to the WJ resource and as such will mitigate WJ log transport costs.

#### **Environmental Compliance**

Other than the land use entitlement compliance needed for the establishment and operation of a WJ value-added processing facility at the Bone Point site, potential air quality permitting is an environmental compliance consideration. The proposed operation has a potential air emission source, i.e. the small portable sawmill and accompanying diesel-fired engine.

The sawmill equipment, specifically the Timber King TL 2200 with a 49 horsepower Kubota diesel-fired engine as listed in Table 5, along with the 3,300 board feet of lumber to be produced during an eight-hour work day, was discussed with the Oregon Department of Environmental Quality (ODEQ), Air Quality Division.<sup>10</sup> It was determined that the sawmill does not need an Air Contaminant Discharge Permit since it does not produce more than 25,000 board feet of lumber in an eight-hour shift, and the 49 horsepower engine is also under ODEQ air quality permitting thresholds.

# **OPPORTUNITIES TO MERGE WJ PRODUCT MARKETING**

As noted in the WJ Product Assessment report (Appendix B, Table 1), there are five active WJ processing enterprises in central and eastern Oregon. All of these operations are relatively small with annual revenue under \$500,000.

<sup>&</sup>lt;sup>10</sup> Personal communication, Alex Haulman, Small Business Technical Advisor, Oregon Department of Environmental Quality, Air Quality Division, February 15, 2017.

TSS recommends working directly with wholesale distributors rather than attempting to merge or coordinate WJ product marketing efforts with existing small-scale WJ processing enterprises and the relatively small markets that they serve.

#### **Existing Wholesale Distributors**

Several of the existing WJ processing enterprises utilize WJ product wholesaler distributors to market products. The advantages of this arrangement include:

- Wholesalers service an existing retail lumber and building products customer base.
- They appear to be financially stable with the ability to provide standing product orders and a 30-day payment schedule.
- They typically operate at a scale that assures significant annual throughput and consistent order files.
- They appear to have effective marketing and outreach to a wide-ranging customer base.
- They have existing relationships with multiple WJ product suppliers.

Currently there are three WJ product wholesale distributors sourcing WJ products produced in Oregon.

#### Dean Innovations

Headquartered in Portland, Dean Innovations (DI)<sup>11</sup> has been marketing landscaping materials and firewood for 16 years. DI operates one retail yard in Portland and markets a range of firewood species including WJ and pine. DI maintains its own firewood processing operation and purchases both logs and processed firewood. Attempts to contact DI were not successful (they did not respond to phone inquiries). Discussions with DI firewood suppliers confirmed that DI prefers to purchase firewood in  $\frac{1}{2}$  cord pallets (plastic wrapped). Current pricing for  $\frac{1}{2}$ cord pallet FOB<sup>12</sup> central Oregon is around \$110.

Discussions with some firewood suppliers in Oregon indicate that DI is not providing timely payment and some firewood producers have curtailed selling firewood to DI as a result.

#### Sustainable Northwest Wood

Founded in 2008, Sustainable Northwest Wood (SNW)<sup>13</sup> is a subsidiary of the non-profit Sustainable Northwest. SNW is headquartered in Portland and works with small-scale sawmills throughout Washington, Oregon, and California to source locally harvested, sustainable supplies of a wide range of lumber products manufactured from a range of tree species. Species marketed include WJ and blue pine.

<sup>&</sup>lt;sup>11</sup> http://www.firewoodportland.com/

 $<sup>^{12}</sup>$  FOB = freight on board truck. Typically used when pricing products loaded onto truck at producers facility.

<sup>&</sup>lt;sup>13</sup> http://www.snwwood.com/Decking-and-Landscaping/Restoration-Juniper-Landscape-Timbers

Products marketed include decking, landscape timbers, lumber, exterior siding, plywood, flooring and interior paneling. SNW works with retail lumber centers located in Washington, Oregon, and California. Due to SNW's track record (eight years as a wholesale distributor) and significant range of tree species and products, SNW is able to cater to a wide range of customers. In 2016, SNW marketed about 600,00 board feet of WJ lumber products. Discussions with SNW<sup>14</sup> confirm a WJ lumber market growth rate of approximately 20% year over year, with sales of 720,000 board feet forecasted for 2017. Discussions with the SNW lumber purchaser<sup>15</sup> confirmed that the primary demand is for WJ lumber products (2x6, 2x8) and landscape timbers (6x6) in eight foot or ten foot lengths. Average price offered for these products is \$900/thousand board feet for number two grade and better lumber and \$1,150/thousand board feet for number one grade and better.

Summarized below in Table 9 is an example of wholesale lumber pricing on a piece count and per unit basis by product. Pricing shown in Table 9 reflects current wholesale lumber pricing provided by SNW.

PRODUCT	GRADE	PIECE COUNT PER UNIT OF LUMBER	BOARD FOOT VOLUME PER UNIT	VALUE PER BOARD	VALUE PER UNIT OF LUMBER
6" x 6" x 8'	#2 and better	35	840	\$22	\$756
2" x 6" x 8'	#2 and better	105	840	\$7	\$756
2" x 8" x 8'	#2 and better	75	800	\$10	\$720
6" x 6" x 8'	#1	35	840	\$28	\$966

Table 9. WJ Wholesale Lumber Pricing Example

In addition to WJ products, SNW also procures blue pine boards (prefer 70% of the board surface to show blue stain).

#### Wilco

Founded in 1967 as a venture initiated by five Willamette Valley farmer cooperatives, Wilco (short for Willamette Valley Cooperatives)<sup>16</sup> is still a farmer-owned cooperative. Headquartered in Mt. Angel, Oregon, Wilco is focused on serving the agricultural sector and maintains farm stores that provide a wide range of supplies. Wilco owns and manages 18 farm stores located throughout Oregon and Washington.

In recent years, Wilco has been actively purchasing WJ landscape timbers (6 x 6) and firewood from suppliers in Oregon. The Wilco lumber purchaser<sup>17</sup> was unwilling to provide a lumber price quote until such time that the RLMT facility was in production.

<sup>&</sup>lt;sup>14</sup> Ryan Temple.

<sup>&</sup>lt;sup>15</sup> Ibid.

<sup>&</sup>lt;sup>16</sup> https://www.wilco.coop/about-us/

<sup>&</sup>lt;sup>17</sup> David Dimick.

# Wholesale Distributors, Representatives, and Contact Information

Outlined below in Table 10 is the contact information for each of the wholesale distributors mentioned above.

WHOLESALE DISTRIBUTOR	PURCHASING AGENT	CONTACT INFORMATION	PRODUCTS PURCHASED
Dean Innovations	N/A	(503) 281-1637	Firewood.
Sustainable Northwest Wood	Ryan Temple	ryan@snwwood.com (503) 239-9663	Full range of WJ lumber products. Also purchase blue pine lumber.
Wilco	David Dimick	ddimick@wilco.coop (503) 845-8148	WJ posts and landscape timbers.
Wilco	Holly Maxwell	hmaxwell@wilco.coop (503) 845-6122	Firewood.

Table 10. WJ Product wholesale Distributors	Table	10.	WJ	Product	Wholesale	Distributors
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## Findings

TSS found several wholesale distributors that have experience with WJ product (lumber and firewood) procurement and distribution. Both Wilco and Sustainable Northwest Wood were responsive to TSS inquiries.

#### Recommendations

In order to optimize and expand WJ markets for products generated by the RLMT processing enterprise, TSS recommends the following.

#### Website Development

Marketing of WJ lumber products and firewood using a website that provides potential customers with visual images of products has proven to be a very effective method to reach retail customers. In addition, customers can place orders online and utilize a web based payment system (pay pal) to complete the transaction.

#### Local Marketing

There may be an opportunity to market lumber and firewood in local communities such as Long Creek and John Day. Marketing bagged firewood at the local grocery or convenience stores could provide significant revenue during hunting season and winter months. In addition, marketing firewood locally in one half or full cord unit measure and slabwood in bundles will optimize revenue due to slightly higher pricing than wholesale pricing. Retail lumber outlets (e.g., Mills Building Supply in John Day) may offer local marketing opportunities for WJ lumber. Considering that the WJ processing facility is likely to be located at the Bone Point site (some distance from Highway 395), it will be important to establish relationships with local retail enterprises that are located in communities that are likely to have consistent consumer traffic. In addition, RLMT should consider signage or setting a lumber trailer (loaded with a variety of WJ products) along Highway 395, directing travelers to the WJ processing site. U.S. Highway 395 is a major transportation route and represents a key marketing opportunity.

#### Wholesale Distribution

TSS recommends that RLMT consider working closely with wholesale distribution organizations for sales of WJ lumber and firewood products. Working with already established, commercial-scale wholesale distributors will assure that critical factors such as cash flow and product inventory management are optimized. This is especially important in the early years of the WJ processing enterprise when local markets for lumber and firewood are still in development.

# WJ REMOVAL/PROCESSING ENTERPRISES OPTIMIZED BUSINESS STRUCTURE

RLMT must decide how to structure the WJ removal and processing enterprises. The business enterprise structure options analyzed include cooperative, limited liability corporation, corporation, and non-profit.

The decision on the choice of business enterprise structure affects exposure to liabilities, tax obligations, setup fees, and ongoing expenses, as well as funding acquisition such as grants and loans. TSS recommends that RLMT consult with an experienced business attorney before choosing a business enterprise structure. A business attorney can also generate and file all the necessary paperwork to create the business enterprise selected by RLMT.

TSS also recommends that one entity manage both the WJ removal and processing enterprises. Since the removal operation is dependent on the financial success of the processing enterprise, operating the enterprises as two separate companies will cost more in administration and create potential risk. For example, the general manager of the holding company (RLMT) can manage both enterprises, sharing employees as necessary and coordinating planning to optimize financial outcomes. Also, the general manager can set transfer pricing (e.g., delivered log prices) as needed to optimize financial returns for both enterprises. Finally, the combined asset base can be useful in loan security. The combined enterprise management requires a strong cost accounting approach so evaluation of the individual enterprise performance is accomplished.

#### Cooperative

A cooperative (co-op) is a business organization owned and controlled by its members for their mutual benefit and common goals or aspirations. Members of the co-op buy shares and have equal voting power regardless of shares purchased. Co-ops are financed through equity investments. In Oregon, cooperatives exist in electric, agriculture, community associations and other areas where a common need or interest exists among its members. In the case of RLMT, members could contribute resources, services, cash or other equity to buy shares.

Commonly, an elected board of directors and officers run the cooperative. Co-op members have the voting power to control the direction of the organization. Although this type of structure may

seem to fit the common need of the property owners in the Ritter area, the management of a coop can be challenging. Many co-ops have challenges in decision making, accountability, and planning since the co-op structure gives board members a stronger hand in directing operations. Keeping directors involved and consistent compensation to the shareholders is also an issue faced by many co-ops.

TSS does not recommend this type of cooperative structure because of potential management and focus issues.

# Corporation

A corporation is an independent legal entity owned by its shareholders. The corporation is held legally liable for the actions and debts the business incurs. A corporation acts as a single entity. It exists separately from its owners and continues to exist even though the shareholders may change. As a separate entity, a corporation must file tax returns. It may own property, sue and be sued. The structure of the corporation provides liability protection for the owner.

Corporations are more complex than other business structures because they tend to have costly administrative fees and complex tax and legal requirements. Because of these issues, corporations are generally suggested for established, larger companies with multiple employees.

For businesses in that position, corporations offer the ability to sell ownership shares in the business through stock offerings. "Going public" through an initial public offering (IPO) is a major selling point in attracting investment capital and high-quality employees.

Since the WJ removal and processing enterprises are considered a start-up and long-term company growth is limited, TSS does not recommend this kind of structure for the RLMT.

# Non-Profit Company

As the name implies, non-profit is a form of organization that is in existence for a purpose other than making a profit. A non-profit reinvests surplus revenues into a continuation of the organization's mission. A non-profit is also tax exempt and can achieve charitable status.

Non-profits must operate in a fashion that does not raise the ire of the Internal Revenue Service. Unrelated income is business income which is taxable under IRS rules. According to the IRS, unrelated income is an activity in an unrelated business (and subject to unrelated business income tax) if it meets three requirements: "It is a trade or business, it is regularly carried on, and it is not substantially related to furthering the exempt purpose of the organization."<sup>18</sup>

There are exemptions to the rule, but when running a business as a non-profit, managers must always be conscious of unrelated income issues. Worrying about separate income issues can stilt business creativity.

<sup>&</sup>lt;sup>18</sup> Unrelated Business Income Defined - irs.gov. (n.d.). Retrieved from https://www.irs.gov/charities-non-profits/unrelated-business-income-defined

Operating as a tax-exempt organization and working in a competitive environment can draw criticism from for-profit competitors. Although the juniper market is not overly competitive, negative criticism from other entities operating in the WJ value-added market sector may develop.

Finally, a strong focus to operate profitably is a requirement for the enterprise to succeed. Undiluted attention to management and operating proficiency is an absolute must in running a non-profit business.

TSS does not recommend a non-profit structure due to impacts on business creativity, potential public criticism and possible diversion from a for-profit mentality. Also, a for-profit organization can create new strategies working for a non-profit in loan and grant acquisition. In addition, the for-profit enterprise can help the non-profit in later years with the deployment of revenue surpluses.

# **Limited Liability Corporation**

A limited liability corporation (LLC) is a hybrid type of enterprise structure that provides the limited liability features of a corporation and the tax efficiencies and operational flexibility of a partnership. An LLC can have one or more members and can be managed by managers or members. Managers can be members of the LLC (but this is not a requirement). To be a member of an LLC, a contribution such as cash, property, or services rendered must be made. A key advantage of the LLC is the limited liability protection it offers to its owners.<sup>19</sup>

The "owners" of an LLC are referred to as "members." The members can consist of a single individual (one owner), two or more individuals, corporations or other LLCs. Unlike shareholders in a corporation, LLCs are not taxed as a separate business entity. Instead, all profits and losses are "passed through" the business to each member of the LLC. LLC members report profits and losses on their personal federal tax returns, just like the owners of a partnership. This "pass through" approach eliminates the double taxation of corporations. In this case, RLMT is the member which is a non-profit.<sup>20</sup>

The internal affairs of the LLC are governed by oral or written operating agreements. These operating agreements are comparable to the bylaws of a corporation. The members manage the internal affairs unless the articles of the organization explicitly state that they will be managed by one or more managers.<sup>21</sup>

TSS recommends the for-profit LLC structure because of its ease of establishment, liability protection and the simplicity of tax calculation.

<sup>20</sup> "Limited Liability Company (LLC) | The U.S. Small Business ..." Insert Name of Site in Italics. N.p., n.d. Web. 14 Feb. 2017 <a href="https://www.sba.gov/starting-business/choose-your-business-structure/limited-lia">https://www.sba.gov/starting-business/choose-your-business-structure/limited-lia</a>.

<sup>&</sup>lt;sup>19</sup> Limited Liability Company (LLC) | The U.S. Small Business ... (n.d.). Retrieved from https://www.sba.gov/starting-business/choose-your-business-structure/limited-lia

<sup>&</sup>lt;sup>14</sup> Feb. 2017 <a href="https://www.sba.gov/starting-business/choose-your-business-structure/limited-l

http://sos.oregon.gov/business/Pages/select-business-name-structure.aspx

# Findings

As noted above, TSS finds that the preferred structure is an LLC for-profit business combining both the WJ removal and processing enterprises (as one LLC). TSS recommends that the manager of the LLC report to a three to five-member board. The Board of Directors for the WJ removal and processing LLC serve at the pleasure of the Board of Directors of the RLMT. The chair of the LLC Board of Directors is selected to report to the RLMT. TSS also recommends that the Board include expertise in accounting, legal and forest products marketing. Outside expertise on the LLC Board is also a benefit, although the cost of such knowledge may be excessive. TSS recommends obtaining outside expertise for the board that is willing to volunteer time to support the RLMT mission. Finally, operating the LLC should employ a cost accounting program that tracks the individual performance of the WJ removal and processing enterprises, separately. Figure 9 provides an example of how the recommended LLC structure would function.



Figure 9. Limited Liability Corporation Structure (Example)

# **KEY FINDINGS AND RECOMMENDATIONS**

Summarized below are the key findings and recommendations generated as a result of this feasibility study. In order to provide RLMT with a comprehensive set of findings and

recommendations, we have also included key findings from the Task 2 WJ Timber and Fiber Supply Assessment and Task 3 WJ Product Market Assessment.

#### Investment Analysis – WJ Removal Enterprise

#### **Findings**

Given the base case assumptions for cost and revenue, the internal rate of return for the investment is 15% with an investment of \$311,000 for equipment plus an additional one time investment of \$61,000 for working capital for a total capital commitment of \$372,000.

A significant risk in this venture is the marketplace. The harvest operation as modeled is entirely dependent on a financially viable buyer that is converting WJ logs into valued commodities. If the processing enterprise cannot pay a market price for WJ logs, the risk to the harvesting operation is substantial. Also, the rate of production for the WJ removal enterprise is essential to the financial health of the investment. Thus, anything that promotes a consistent production rate is paramount to the operation. A rigorous equipment maintenance program, strategic management of removal operations to assure at least 140 days of annual operation, and having trained personnel will help mitigate issues that may impede or curtail production. Extending the length of harvest season will significantly improve the cash flow and internal rate of return. Conducting WJ removal on surrounding land ownerships (private and public) may provide an opportunity to diversify revenue (e.g., collect fees for range improvement). Regardless of what the marketplace does, production efficiency is one item that is under the control of the WJ removal enterprise.

#### Recommendations

TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT.

#### Investment Analysis – WJ Processing Enterprise

#### Findings

Given the base case assumptions for cost and revenue, the internal rate of return for the investment is 20% with an investment of \$260,818 for equipment and site improvements plus an additional one time investment of \$80,000 for working capital for a total capital commitment of \$340,818.

Finished product sales is a key driver (not surprising). Strategic marketing of finished products (lumber, slabwood, firewood, roundstock) both locally and regionally is paramount to financial success of the WJ processing enterprise.

Similar to the financial performance of the WJ removal enterprise, extending the working season of the WJ processing enterprise significantly improves financial performance. The WJ processing operation represents a fixed asset and additional throughput (operation over and above 160 days/year) will improve revenue and internal rate of return. Procuring WJ sawlogs

on the open market will diversify log supply, contribute to buildup of winter inventory and potentially allow extension of the operating season.

#### Recommendations

TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT.

# Value-Added Processing Facility Siting

## **Findings**

Two sites located within were considered as candidate sites for location of a WJ value-added processing site. The Junction property site is located adjacent to U.S. Highway 395 and the Bone Point property site is located about 12 miles from Highway 395, near Ritter. Both properties have site attributes that would support WJ processing operations. Much of the Junction property site is located within a State Wild and Scenic Waterway (Middle Fork of the John Day River).

#### Recommendations

TSS recommends the Bone Point property site as the preferred location for the WJ processing operation.

# **Opportunities to Merge WJ Product Marketing**

# **Findings**

TSS found several wholesale distributors that have experience with WJ product (lumber and firewood) procurement and distribution. Both Wilco and Sustainable Northwest Wood were responsive to TSS inquiries.

#### Recommendations

In order to optimize and expand WJ markets for products generated by the RLMT processing enterprise, TSS recommendations are summarized below.

# Website Development

Marketing of WJ lumber products and firewood using a website that provides potential customers with visual images of products has proven to be a very effective method to reach retail customers. In addition, customers can place orders online and utilize a web based payment system (pay pal) to complete the transaction.

# Local Marketing

There may be an opportunity to market lumber and firewood in local communities such as Long Creek and John Day. Marketing bagged firewood at the local grocery or convenience stores could provide significant revenue during hunting season and winter months. In addition,

marketing firewood locally in one half or full cord unit measure and slabwood in bundles will optimize revenue due to slightly higher pricing than wholesale pricing. Retail lumber outlets (e.g., Mills Building Supply in John Day) may offer local marketing opportunities for WJ lumber. Considering that the WJ processing facility is likely to be located at the Bone Point site (some distance from Highway 395), it will be important to establish relationships with local retail enterprises that are located in communities that are likely to have consistent consumer traffic. In addition, RLMT should consider signage or setting a lumber trailer (loaded with a variety of WJ products) along Highway 395, directing travelers to the WJ processing site. U.S. Highway 395 is a major transportation route and represents a key marketing opportunity.

#### Wholesale Distribution

TSS recommends that RLMT consider working closely with wholesale distribution organizations for sales of WJ lumber and firewood products. Working with already established, commercial-scale wholesale distributors will assure that critical factors such as cash flow and product inventory management are optimized. This is especially important in the early years of the WJ processing enterprise when local markets for lumber and firewood are still in development.

## WJ Removal/Processing Enterprises Optimized Business Structure

## **Findings**

The preferred business structure for RLMT is an LLC for-profit business combining both the WJ removal and processing enterprises (as one LLC).

#### Recommendations

TSS recommends that the manager of the LLC (WJ removal and WJ processing enterprise) report to a three to five-member board. The Board of Directors for the WJ removal and processing LLC serve at the pleasure of the Board of Directors of the RLMT. The chair of the LLC Board of Directors is selected to report to the RLMT. TSS also recommends that the Board include expertise in accounting, legal and forest products marketing. Outside expertise on the LLC Board is also a benefit, although the cost of such knowledge may be excessive. TSS recommends obtaining outside expertise for the board that is willing to volunteer time to support the RLMT mission. Finally, operating the LLC should employ a cost accounting program that tracks the individual performance of the WJ removal and processing enterprises, separately.

#### WJ Timber and Fiber Supply Assessment

#### **Findings**

# WJ Timber and Fiber Supply Economically Available

Interviews with logging contractors familiar with WJ harvest techniques and economics confirmed that WJ acreage with densities under 25% canopy cover are not considered economically available for harvest operations. The WJ density and slope gradient analysis results of the Ritter Target Study Area confirms that approximately 9,553 acres of WJ cover type are located on slopes <35% and have WJ canopy cover of at least 25%. The average sawlog and

harvest residual volume per acre will be higher in these more dense stands (higher canopy cover equals higher volume per acre).

TSS used a 7 GT per acre average for sawlog volume and 6 GT per acre average for harvest residuals volume to calculate economically available supply.<sup>22</sup> Approximately 66,871 GT sawlogs and 57,318 GT harvest residuals fiber are considered economically available.<sup>23</sup>

Using the economically available 9,553 acres and assuming 750 acres are treated per year, the Target Study Area landscape would require about 13 years to treat. One commercial truckload of WJ sawlogs will accommodate 25 GT. At 750 acres treated, approximately 5,250 GT of sawlogs could be removed annually. This amounts to the equivalent of 210 truckloads of sawlogs. It is anticipated that WJ and ponderosa pine logs from landowners outside of the TSA will likely be available as an additional sawlog resource.<sup>24</sup> There will likely be opportunities for a RLMT WJ removal enterprise to market services to landowners and land managers outside of the Target Study Area, thus expanding potentially WJ and ponderosa pine sawlog resource availability.

#### Current Acreage Treated within the TSA

Land ownerships within the TSA are currently treating between 100 and 200 acres of WJ cover type.<sup>25</sup> Most of the logs harvested are utilized for personal use firewood and fence posts. Limbs, tops and small WJ stems generated as byproducts are piled and burned on site.

#### Recommendations

#### Target Sites for WJ Harvest

As RLMT considers development of a WJ treatment implementation plan, there should be a focus on early phase treatment of the more economical sites including those with the following attributes:

- Relatively high WJ density (25% plus);
- Gentle terrain (<35% slope);
- Adjacent to all weather road systems;
- Located within short haul distance of processing site (Bone Point property site).

By focusing on the more cost effective treatment sites, the RLMT will be able to hone field operations (train personnel, optimize equipment selection) in preparation for treatment of more challenging terrain and less dense stands of WJ.

# Timing of Harvest Operations

<sup>&</sup>lt;sup>22</sup> WJ harvest residual volume will be slightly lower than sawlog volume per acre with WJ density of 25% plus. This is due to better WJ form class and relatively fewer limbs exhibited in denser stands on higher growing sites.

<sup>&</sup>lt;sup>23</sup> Note that the potentially, technically and economically available sawlog and fiber estimates are based on best available data.

<sup>&</sup>lt;sup>24</sup> RLMT Board of Directors reports that adjoining landowners are expressing interest in supplying WJ and ponderosa pine logs.

<sup>&</sup>lt;sup>25</sup> Per Patti Hudson, Project Coordinator, RLMT.

WJ treatment contractors have found that 12 to 24 month harvest lead-time is very helpful. By falling WJ well in advance of processing (for lumber or firewood), the WJ logs have less moisture and therefore much less weight. With less weight comes more cost effective operations allowing for more cubic feet of logs, firewood, or lumber to be economically transported on board truck. This significantly mitigates transport costs. Many of the RLMT landowners are now leaving WJ logs on the ground in anticipation of a local sawlog and/or firewood market.

#### WJ Product Market Assessment

## **Findings**

# WJ Manufactured Products

The market for WJ products appears to be very promising for the type of solid wood products that the RLMT WJ processing operation could produce (e.g., landscape timbers, dimension lumber, fence posts, roundstock). Remaining focused on cutting WJ and processing the WJ material for standard markets is prudent. Diversification into other products (custom lumber) should be considered at a later phase. The products that Ritter should focus on are what the markets are demanding today. These products include 6"x 6", 2"x 6", 2"x 8" lumber and roundstock fence post products. By-products produced (slabs) can be bundled (banded) and marketed as firewood.

# Local Markets for WJ Logs and Fiber

Regional markets for both WJ logs and WJ fiber are currently very limited. Interviews with central and eastern Oregon land managers, foresters, and logging contractors confirmed that there are wholesale markets for WJ firewood logs in Tri Cities (Richland, Kennewick, Pasco) and Winnemucca, Nevada. However, due to significant haul costs and very low natural gas prices (consumers seek out low-cost energy), the profit margin for firewood logs is minimal.

WJ fiber markets have traditionally been focused on biomass fuel for power generation. The relatively low moisture content (30%) and high heat value (8,400 Btu/dry pound) of WJ fiber makes it an attractive fuel for commercial power production. However, the closures of local biomass power plants at Heppner and Prairie City have greatly impacted the local biomass fuel market. There is currently no local market for WJ biomass chips.

Portland General Electric is considering firing the Boardman, Oregon, coal-fired facility on biomass fuel, as PGE has committed to curtail the use of coal fuel by 2020. PGE plans to conduct a test-fire of 100% biomass fuel using torrefied fuel provided by Oregon Torrefaction. Discussions with a representative from Oregon Torrefaction<sup>26</sup> confirmed that PGE plans to fire using torrefied fuel for approximately one day with 8,000 GT. If this goes well, there could be a second trial arranged at approximately 50,000 GT. PGE will likely make a formal decision in 2018 or 2019 regarding long-term sustained use of wood fuel at Boardman. Should PGE decide to proceed with wood fuel usage, Oregon Torrefaction will likely have a processing facility at John Day that would procure wood fiber (possibly including WJ fiber) for processing into torrefied fuel.

<sup>&</sup>lt;sup>26</sup> Matt Krumenauer, Oregon Torrefaction.

# Recommendations

#### Wholesale Distribution Outlets

As noted in the Opportunities to Merge WJ Product Marketing section of this report, there are several commercial-scale wholesale lumber distributors in Oregon that are purchasing WJ products. TSS recommends that developing a long-term relationship with these distributors will optimize revenue and mitigate financial risk for the WJ processing operation.
Appendix A. Western Juniper Timber and Fiber Supply Assessment

# WESTERN JUNIPER TIMBER AND FIBER SUPPLY ASSESSMENT

Prepared for: The Ritter Land Management Team



Prepared by: TSS Consultants Rancho Cordova, California



December 19, 2016 Final Report

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The TSS Consultants team includes:

Tad Mason, Forester Calvin Mukumoto, Business and Financial Specialist Gerard LaBrecque, Western Juniper Harvest and Utilization Specialist Camila Banales-Seguel, Geographic Information System Specialist

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# Appendix

Appendix A.	RLMT	Western	Juniper	Treatment	Prescription
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### **INTRODUCTION**

The Ritter Land Management Team (RLMT) is considering the establishment of a Western Juniper (WJ) harvest and processing enterprise. In order to effectively develop and deploy this enterprise, RLMT needs to understand current WJ timber and fiber supply available from the greater Ritter area. This WJ timber and fiber assessment is an effort to review and characterize roundwood and fiber supply available over the next 10 to 15 years, generated as a byproduct of forest and rangeland restoration in the greater Ritter area.

The primary objective of RLMT is to leverage landowner stewardship goals and generate economic opportunity and market-based drivers within the area surrounding Ritter. In October 2015, the RLMT created a Strategic Action Plan (SAP) and has successfully submitted Title II and Oregon Watershed Enhancement Board proposals to help fund small range improvement activities, including WJ treatments. The RLMT would now like to ramp up the pace and scale of landscape level treatments, consistent with the SAP which will require a coordinated, collaborative approach to pursue market-based solutions.

The RLMT recognizes that WJ encroachment is a very significant threat to ecological productivity, including wildlife habitat and biodiversity. The RLMT Landowner Discovery Tool interviews confirmed that RLMT members believe WJ removal and rangeland improvement are a first priority resource management issue. The SAP notes WJ vegetation cover estimates within the Ritter area boundary vary greatly, ranging from 13,000 acres (Oregon GAP Analysis) to almost 55,000 acres (Portland State University and the RLMT Landowner Discovery Tool survey). The SAP further suggests a key objective (Objective 1.2B) is the treatment of 3,550 acres of WJ dominated landscape by 2025. Recent discussions with the RLMT<sup>1</sup> confirmed that the 3,550 acre treatment target by 2025 was a very high-level estimate and the Team is expecting that with a fulltime crew focused on restoration the pace and scale of treatment will exceed this figure.

Understanding that the costs to remove WJ are quite high and local markets practically nonexistent, the RLMT is considering (among several options under review) establishment of a locally based WJ sawmill, scaled appropriately to utilize WJ logs generated as a byproduct of forest and rangeland restoration activities. A potential vertically-integrated business model that the RLMT would like to consider includes an enterprise that conducts forest and rangeland restoration, WJ removal and utilization in an appropriately scaled, locally-based sawmill. A targeted outcome for the RLMT is integration of restoration and sawmilling activities facilitating year-round operations and employment of a local workforce while creating a local market for WJ round wood.

<sup>&</sup>lt;sup>1</sup> October 24, 2016, RLMT conference call and November 4, 2016, RLMT Board of Directors conference call.

### **VEGETATION COVER AND TOPOGRAPHY ANALYSIS**

WJ Timber and biomass fiber supply availability for any given region is dependent on vegetation cover, topography, land ownership, and management objectives. TSS conducted a field visit on September 16, 2016, to view the RLMT region first hand. In addition, working with Grant County Soil and Water Conservation District,<sup>2</sup> TSS conducted a Geographic Information System (GIS) analysis of vegetation cover and topography for the RLMT Target Study Area (TSA).

#### **Vegetation Cover**

The major vegetation cover classes were mapped and their acreages calculated using ARCGIS software. Our focus was to characterize the vegetation types and terrain that is representative of the RLMT TSA. We relied upon the 2010 Oregon Spatial Data Library (OSDL) for most of the analysis. Figure 1 is a map highlighting vegetation cover classes within the TSA.

#### Figure 1. Vegetation Cover Types





Vegetation Cover Types



<sup>&</sup>lt;sup>2</sup> Kyle Sullivan, Grant County Soil and Water Conservation District.

Findings from the vegetation cover analysis are summarized in Table 1.

	TOTAL	PERCENT
VEGETATION COVER TYPE	ACRES	<b>OF TOTAL</b>
Agriculture	269	<1%
Barren / Other	929	1%
Burn (Monument Complex Fire)	2,801	3%
Coniferous (Mixed)	24,358	23%
Western Juniper	13,157	12%
Hardwood and Mixed Forest	5,015	5%
Herbaceous	7,267	7%
Shrub	51,843	49%
Water	6	<1%
Wetland	6	<1%
TOTAL	105,650	

### Table 1. Vegetation Cover Acreage

From our field tour of the TSA, it is clear that WJ is a significant component of the mixed conifer as well as the hardwood and mixed forest vegetation cover types. In addition, WJ density analysis conducted by Portland State University confirms a more significant vegetation cover for WJ than is represented by the OSDL data.

### **WJ Density**

Western Juniper density data was acquired from 2011 work that Portland State University (PSU) generated utilizing satellite imagery. The 2010 OSDL data does not align with the PSU data. Because the PSU data is more recent and utilizes remote sensing methodologies, we surmise that it is likely more accurate. However, in order to assess data accuracy, we recommend field visits to confirm WJ location and density.





Findings from the WJ density analysis are summarized in Table 2.

JUNIPER COVER TYPE BY DENSITY CLASS	TOTAL ACRES	PERCENT OF TOTAL
05-10% Juniper Cover	10,534	10%
10-15% Juniper Cover	7,134	7%
15-20% Juniper Cover	6,949	7%
20-25% Juniper Cover	6,742	6%
25-30% Juniper Cover	4,740	4%
30-35% Juniper Cover	3,702	4%
35-40% Juniper Cover	2,495	2%
40-45% Juniper Cover	1,376	1%
45-50% Juniper Cover	461	<1%
50% and Greater Juniper Cover	213	<1%
Juniper Cover Total	44,345	42%
Other Vegetation Cover Type	61,305	58%
TOTAL	105,650	

Table 2. WJ Cover Acreage by Density Class

WJ density analysis confirms that 44,345 acres of the TSA have WJ vegetation cover present, representing approximately 42% of the TSA.

#### **Slope Gradient Analysis**

Slope gradient is important to characterize due to its impact on WJ harvest and collection costs. Terrain with slope gradient over 35% is more challenging to operate on due to conditions (steep slope) that impede efficient and cost effective operations. In addition, safety becomes a significant consideration, with 60%+ slope conditions considered too steep for safe operation of ground-based equipment.

Figure 3. Slope Gradient for TSA



# Slope Gradient Asessment Ritter Land Management Team





Findings from the slope gradient analysis are summarized in Table 3.

Table 3.	Slope	Gradient	Analysis	Acreage
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		PERCENT
<b>SLOPE GRADIENT</b>	ACRES	OF TOTAL
Slope <35%	81,311	77%
Slope 36-59%	20,630	20%
Slope >60%	3,709	4%
TOTAL	105,650	100%

Almost 25% of the TSA has slope gradient conditions considered challenging for ground-based treatment and harvest operations.

Combining WJ density with slope gradient analysis provides data that can be used to forecast acreage available for economic treatment and harvest. Table 4 summarizes WJ density by slope gradient class.

JUNIPER COVER TYPE BY DENSITY CLASS	ACREAGE WITH SLOPE <35%	ACREAGE WITH SLOPE 36-59%	ACREAGE WITH SLOPE >60%	TOTAL ACRES
05-10% Juniper Cover	7,665	2,366	503	10,534
10-15% Juniper Cover	5,196	1,665	273	7,134
15-20% Juniper Cover	5,088	1,627	234	6,949
20-25% Juniper Cover	4,899	1,640	203	6,742
25-30% Juniper Cover	3,426	1,165	149	4,740
30-35% Juniper Cover	2,694	904	104	3,702
35-40% Juniper Cover	1,908	538	49	2,495
40-45% Juniper Cover	1,043	304	29	1,376
45-50% Juniper Cover	337	112	12	461
50% + Juniper Cover	145	59	9	213
Juniper Cover Total	32,401	10,380	1,565	44,345
Other Vegetation Cover Type	48,911	10,250	2,144	61,305
TOTAL	81,311	20,630	3,709	105,650

Table 4. Slope Gradient Analysis Acreage by WJ Density Class

### WJ TIMBER AND FIBER SUPPLY ANALYSIS

With an understanding of vegetation cover types, WJ density, and slope gradient within the TSA, TSS conducted a WJ log and fiber supply analysis. Outlined below are the methodologies used to generate WJ log and fiber estimates. Note that the common unit of measure is green tons (GT).<sup>3</sup> In addition, board foot measure  $(BF)^4$  is commonly used when expressing log volume.

In order to effectively forecast WJ fiber supply, a RLMT treatment prescription was developed. This prescription (see Appendix A) was created based on consensus within the RLMT. While this serves to provide clear treatment objectives and outcomes for the WJ timber and fiber supply analysis, it in no way represents a one-size-fits-all approach. Each of the landowners making up the RLMT will define the treatment prescription to be implemented based on their own objectives and desired future condition of the landscape.

<sup>&</sup>lt;sup>3</sup> One green ton represents 2,000 pounds with no adjustment for moisture content.

<sup>&</sup>lt;sup>4</sup> One board foot represents a board 12" by 12" and 1" thick.

#### WJ Timber and Fiber Supply Potentially Available

As noted in Table 4, the TSA landscape with standing WJ vegetation amounts to 44,345 acres.<sup>5</sup> Interviews with land managers, foresters, and logging contractors confirm WJ acreage within the TSA will average between 2 and 8 GT per acre of sawlogs, with an equal volume of harvest residuals fiber (limbs and tops). The field tour (September 16, 2016) confirmed that the standing volume of WJ within the TSA is considered above average form and height for WJ typically found within central Oregon. For the purposes of this analysis, TSS assumes an average sawlog and harvest residual volume of 4 GT per acre (8 GT total) average across all WJ densities. With a total acreage of 44,345, this amounts to a potentially available volume of approximately 177,380 GT sawlogs and 177,380 GT harvest residuals fiber.

### WJ Timber and Fiber Supply Technically Available

Not all landscapes will readily accommodate WJ harvest operations. Slope gradient is a major limiting factor with 35% slope considered the limit for efficient, cost effective harvest equipment operation. The slope gradient analysis results (see Table 4) found that approximately 32,401 acres of WJ vegetation cover type are on slopes under 35%. Assuming an average sawlog and harvest residual volume per acre of 4 GT, then 129,604 GT sawlogs and 129,604 harvest residuals fiber are considered technically available.

### WJ Timber and Fiber Supply Economically Available

Interviews with logging contractors familiar with WJ harvest techniques and economics confirmed that WJ acreage with densities under 25% canopy cover are not considered economically available for harvest operations. The WJ density and slope gradient analysis results (see Table 4) confirm that approximately 9,553 acres of WJ cover type are located on slopes <35% and have WJ canopy cover of at least 25%. The average sawlog and harvest residual volume per acre will be higher in these more dense stands (higher canopy cover equals higher volume per acre). Figure 4 is a map highlighting the locations of WJ stands exceeding 25% canopy cover on terrain that has slope conditions less than 35%.

<sup>&</sup>lt;sup>5</sup> Based on 2011 research by Portland State University.



# Figure 4. Target Locations for Western Juniper Harvest

TSS used a 7 GT per acre average for sawlog volume and 6 GT per acre average for harvest residuals volume to calculate economically available supply.<sup>6</sup> Approximately 66,871 GT sawlogs and 57,318 GT harvest residuals fiber are considered economically available.<sup>7</sup>

Table 5 summarizes sawlog and fiber availability.

Table 5.	WJ Sawlog/Fiber	Considered Po	tentially. Tec	hnically, Econ	omically Available
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WJ FEEDSTOCK TYPE	POTENTIALLY AVAILABLE	TECHNCIALLY AVAILABLE	ECONOMICALLY AVAILABLE
WJ Sawlogs	177,380 GT	129,604 GT	66,871 GT
WJ Fiber (Harvest Residuals)	177,380 GT	129,604 GT	57,318 GT

Using the economically available 9,553 acres and assuming 450 acres are treated per year, the TSA landscape would require about 21 years to treat. One commercial truckload of WJ should accommodate 30 GT. At 450 acres treated, approximately 3,150 GT of sawlogs and 2,700 GT of fiber could be harvested annually. This amounts to the equivalent of 105 truckloads of sawlogs and 90 truckloads of fiber. It is anticipated that WJ and ponderosa pine logs from landowners outside of the TSA will likely be available as an additional sawlog resource.<sup>8</sup>

### **Current Acreage Treated within the TSA**

Land ownerships within the TSA are currently treating between 100 and 200 acres of WJ cover type.<sup>9</sup> Most of the logs harvested are utilized for personal use firewood and fence posts. Limbs, tops and small WJ stems generated as byproducts are piled and burned on site. Assuming treatment of 150 acres per year and 6 GT per acre, this amounts to about 900 GT of harvest residuals (mostly limbs and tops) piled and burned annually.

## WJ TIMBER HARVEST, COLLECTION AND TRANSPORT COSTS

Using findings from vegetation cover, WJ density, slope gradient analysis, and interviews with central Oregon logging contractors, TSS conducted an analysis of WJ sawlog and fiber harvest, collection, chipping, and transport costs.

### WJ Sawlog and Fiber Cost Estimates

Summarized in Table 6 is the estimate of WJ sawlog and fiber harvest, collection, chipping (fiber only) and transport costs. These are high-level cost estimates and assume an average transport distance of 15 miles one way for logs delivered to a RLMT sawmill site and 60 miles one way

<sup>&</sup>lt;sup>6</sup> WJ harvest residual volume will be slightly lower than sawlog volume per acre with WJ density of 25% plus. This is due to better WJ form class and relatively fewer limbs exhibited in denser stands on higher growing sites.

<sup>&</sup>lt;sup>7</sup> Note that the potentially, technically and economically available sawlog and fiber estimates are based on best available data.

<sup>&</sup>lt;sup>8</sup> RLMT Board of Directors reports that adjoining landowners are expressing interest in supplying WJ and ponderosa pine logs.

<sup>&</sup>lt;sup>9</sup> Per Patti Hudson, Project Coordinator, RLMT.

transport for WJ fiber (chipped limbs, tops, unmerchantable stems) delivered to John Day, Oregon. Due to the high level of economic analysis and stand variability (e.g., stand density, topography, road location), the harvest, collection, chipping and transport costs are provided in a low and high range.

FEEDSTOCK TYPE	LOW RANGE	HIGH RANGE
WJ Sawlogs	\$43/GT	\$49/GT
WJ Fiber (Harvest Residuals)	\$37/GT	\$42/GT

Table 6.	WJ Harvest,	<b>Collection and</b>	<b>Transport (</b>	Cost Estimate
	,		1	

Assumptions used when calculating these costs are summarized below.

WJ Sawlogs:

- > Average cost to harvest, collect and load WJ logs onto log trucks at roadside is \$30/GT.
- > Cost to transport logs using a self-loading log truck is \$125/hour.
- Average haul distance is 15 miles one way (three hours round trip including load and unload time).
- ▶ Log truck will transport 30 GT.
- ▶ High range costs are 15% higher than low range.

WJ Fiber:

- Average cost to harvest, collect, chip and load WJ harvest residuals at roadside is \$21/GT.
- ➤ Cost to transport WJ fiber (in chip form) using a chip truck is \$100/hour.
- Average haul distance is 60 miles one way (four and one half hours round trip, including load and unload time).
- ▶ Chip truck will transport 30 GT.
- Average moisture content is 30%.
- ▶ High range costs are 15% higher than low range.

### RECOMMENDATIONS

Outlined below are recommendations regarding treatment of WJ within the TSA.

### **Target Sites for WJ Harvest**

As RLMT considers development of a WJ treatment implementation plan, there should be a focus on early phase treatment of the more economical sites including those with the following attributes:

Relatively high WJ density (25% plus)

- ➢ Gentle terrain (<35% slope)</p>
- Adjacent to all weather road systems
- Located within short haul distance of processing site (Ritter Junction site or Heise Road site)

By focusing on the more cost effective treatment sites, the RLMT will be able to hone field operations (train personnel, optimize equipment selection) in preparation for treatment of more challenging terrain and less dense stands of WJ.

#### **Timing of Harvest Operations**

WJ treatment contractors have found that 12 to 24 month harvest lead-time is very helpful. By falling WJ well in advance of processing (for lumber or firewood), the WJ logs have less moisture and therefore much less weight. With less weight comes more cost effective operations allowing for more cubic feet of logs, firewood, or lumber to be economically transported on board truck. This significantly mitigates transport costs. Many of the RLMT landowners are now leaving WJ logs on the ground in anticipation of a local sawlog and/or firewood market.

# Appendix A. RLMT Western Juniper Treatment Prescription

In order to forecast WJ sawlog and fiber availability, a treatment prescription must be considered. Each land ownership within the RLMT footprint will have more detailed prescriptions based on the ownership's specific desired future condition of the WJ woodland and mixed conifer stands following treatment. Summarized below is a high-level prescription that TSS plans to use to forecast WJ volume removed for the purposes of the current WJ supply availability analysis being conducted by TSS.

The desired future condition across the RLMT Target Study Area is a return to pre-settlement conditions. In order to achieve this condition, the following treatment prescription applies.

- 100% WJ stem removal within mixed conifer stands.
- 100% WJ stem removal within riparian areas (draws, streamside zone) unless there is potentially adverse soil impacts from removal practices. Retain some WJ stems on sensitive soils or steep slopes within the riparian area.
- No active removal of WJ on slopes over 60%. (WJ occurred naturally across steep slopes, rocky hillsides and ridges in pre-settlement time.)
- In WJ dominated sites, retain 10-20% of the WJ on a volume per acre basis. Retain a blend of WJ stems across size classes so a variety of WJ age classes are left behind. Depending on each landowner's treatment objectives, WJ retention may be higher with larger WJ stems retained (shade, habitat, esthetic considerations).
- In WJ dominated sites, 85-90% of the commercial size WJ stems (>6" DBH) will be removed.
- Slash will be piled for burning (during winter conditions) unless a ready market exists for the un-merchantable limbs and tops.

Appendix B. Western Juniper Product Market Assessment

# WESTERN JUNIPER PRODUCT MARKET ASSESSMENT

Prepared for: The Ritter Land Management Team



Prepared by: TSS Consultants



January 20, 2017 Final Report

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### **INTRODUCTION**

The Ritter Land Management Team (RLMT) is considering the establishment of a Western Juniper (WJ) processing enterprise. To effectively develop and deploy this enterprise, RLMT needs to understand current WJ product market conditions and trends. This market assessment is an effort to review and characterize current and emerging WJ product markets that show optimized potential for long-term success.

The primary objective of RLMT is to leverage landowner stewardship goals and generate economic opportunity and market-based drivers within the area surrounding Ritter. In October 2015, the RLMT created a Strategic Action Plan (SAP) and has successfully submitted Title II and Oregon Watershed Enhancement Board proposals to help fund small range improvement activities, including WJ treatments. The RLMT would now like to ramp up the pace and scale of landscape level treatments, consistent with the SAP, which will require a coordinated, collaborative approach to pursue market-based creative solutions.

The RLMT recognizes that WJ encroachment is a very significant threat to ecological productivity, including wildlife habitat and biodiversity. The recently completed WJ timber and fiber supply assessment (as conducted by TSS) found that approximately 9,553 acres of WJ dominated landscape within the RLMT target study area could take 21 years to complete at 450 acres per year of treatment.

Understanding that the costs to remove WJ are quite high and local markets are almost nonexistent, the RLMT is considering establishment of a locally-based WJ sawmill, sized appropriately to utilize WJ round wood. The WJ logs targeted for utilization are generated as a byproduct of forest and rangeland restoration activities within the RLMT region and on private and public lands located tributary to Ritter.

### **CURRENT WJ PRODUCT MARKETS**

Western Juniper is a native tree or shrub of the western United States. Growing at 2,900 to 9,880 feet in elevation, WJ is considered a nuisance by many in Oregon. Some estimate that the population and acreage covered by WJ have grown 3 to 10 times over the last 150 years.<sup>1</sup> Many attribute fire control to the growth of the WJ population and acreage. WJ uses up to 35 gallons of water per day, out-competing the browse for wildlife and the grasses for livestock. Cutting of WJ as a rangeland improvement method is making WJ available for conversion into forest products.

The wood characteristics of WJ compare favorably with other North American softwoods. It is harder than ponderosa pine and has more nail strength than Douglas-fir and ponderosa pine. WJ

<sup>&</sup>lt;sup>1</sup> Western Juniper Factsheet, Oregon State University.

is considered splendid for machining and bending and is excellent for gluing and finishing. Examples of WJ value added products can be found on the Western Juniper Alliance website.<sup>2</sup>

One characteristic of WJ, which lends itself to many products, is WJ's high natural resistance to insect and rot. A 1999 Oregon State University Forest Research Laboratory showed that WJ untreated fencepost lasted 30+ years, longer than any other untreated western tree species.<sup>3</sup> This characteristic makes WJ superb for outdoor applications such as posts, siding, decking and patio furniture.

WJ is also pleasantly aromatic. The aromatic features of WJ make it usable in essential oils, as a botanical for gin and perhaps other applications (such as an insect repellant). Eastern red cedar, which is also a juniper, is used in many applications where the aromatic nature is critical. Examples of red cedar products are hope chests and closet linings. This market may be available to WJ enterprises.

As stated earlier, WJ can grow as a shrub, with limited recoverable lumber value when compared to a tree with good form class. However, WJ rarely grows more than two logs tall (16'6'') on a short-log basis. The bark of the tree is like cedar and can grow into the heartwood through bark seams. Also, rot pockets are standard throughout the tree. The wood is two-toned with cream colors with red bands.

Meeting customer expectations is of the utmost importance in managing a successful WJ enterprise. Processing lumber that meets the dimensional requirements and characteristics of the client's demand is paramount in supplying markets. The consistency of dimensions and meeting requirements for knots, rot, wane, checking, splits and other characteristics are key factors to consider in order to deliver good customer service. Repeat business and referrals are important to long-term financial success. Sufficient quantities of a product are also important so customers can complete projects, or in the case of wholesale markets, the customer can maintain an inventory that meets market demand. The WJ enterprise must produce a consistent product in sufficient quantities and meet quality standards that satisfies customers at a price point allowing a fair profit for the enterprise.

### Solid Wood Products – Residential

WJ solid wood applications in the residential markets include landscape timbers, fencing, siding, decking, interior paneling and patio furniture, molding, and cabinetry. Most standard cuts for this market are full sawn, 6x6 timbers. For boards, 2x6 and 2x8 are standard. Decking will utilize boards in eight-foot lengths. WJ lumber bends much easier than pine or Douglas-fir, so boards in shorter lengths are preferred. Otherwise, installation of more intermediate supports (e.g., joists) is required. Cabinets may use wider boards that in most cases have small tight knots or no knots at all (e.g., clear). However, the very nature of WJ enhances the artistic appeal of the wood so knots and bark seams can add beauty to the finished product. Landscape timbers are

<sup>&</sup>lt;sup>2</sup> http://www.westernjuniper.org/western-juniper-in-action/

<sup>&</sup>lt;sup>3</sup> Morrell, J.J., D.J. Miller, and P.F. Schneider. 1999. The service life of treated and untreated fence posts: 1996 postfarm report. Research contribution 26.

most commonly the 6x6 and 5x5 sizes at eight foot length, taking advantage of the rot resistance of WJ.

Specialty items such as handrails and balusters will typically use round-wood products from branches and smaller WJ boles. Other specialty items such as kitchen countertops will require wider cuts with an eye on aesthetic appeal. If processed correctly, these specialty items can reap top dollars in high-end home applications.

#### Solid Wood Products – Industrial/Agriculture

Industrial uses are varied and many. These products take advantage of the essential characteristics of WJ. Fence posts for ranches, poles for hop growers and end posts for wineries, leverage the natural insect repellency and rot resistance of WJ. Secondary manufacturers use WJ lumber to produce siding, decking, molding, essential oils, and paneling.

Examples of round-wood products for the industrial and agricultural markets are rails for corrals or fences, posts for fencing, and poles for various uses (e.g., gate wood, pole barns). Round-wood fence posts grouped into 3"/4", 4"/5", 5"/6", and 6"/7" small end diameters in 8 foot lengths are preferred.

### Landscape Timbers

Timbers cut from the heartwood of the WJ boles are excellent in landscape timber applications. Lumber dimensions for landscape timbers is generally full sawn 6x6 by 8 feet long. The main advantage to WJ is its natural resistance to rot, so it is a natural timber as opposed to a chemically treated timber. Many customers do not want to put timbers treated with chemicals into their gardens, so a natural choice such as WJ is preferred.

### Firewood

Firewood is best generated as a by-product of WJ processing operations. For example, logs with high defect (e.g., rot) can be sorted for use as firewood. It is best to sort the higher grade WJ logs with minimal rot for use in solid lumber production, thus optimizing higher net revenue.

WJ does make an excellent firewood, with heating value close to Douglas-fir. Some WJ sawmills have developed markets for WJ slab wood generated as a byproduct from milling operations. The revenue from slab wood bundled as firewood is on the margin, only covering packaging and transportation costs. Economically, it is a good opportunity to maximize revenue for the mill.

### **Unique Quality Products**

There are many product opportunities for WJ enterprises. Products requiring the aesthetic craftsman's qualities of WJ are often good paying projects and are very diverse. Examples of these products are furniture, cabinetry, staircases, household items, and accent features for the interior or exterior of homes and offices. As noted earlier, customers seeking a natural alternative to chemical treatment for rot and insect resistance are attracted to WJ. Siding and

decking are perfect examples of products fitting the insect and rot resistance category. Environmental/social benefit is a plus that many WJ purchasers feel adds value. The restoration of landscapes into viable habitat for wildlife such as sage grouse or rangelands for livestock production is a win/win for nature and rural communities. The aromatic/flavor aspects of WJ are also an advantage. We mentioned the use of juniper berries for gin. There are other products utilizing the flavor adding features of juniper. In Europe, for example, barrel staves of Juniper add flavor to olive oil. Not only is Juniper easy to bend, lending itself to barrel production, but it also has a flavor adding feature that European markets find valuable. The ease of wood working with WJ offers another outlet of product development.

### Value Chain

The value chain for the WJ market is detailed in Figure 1. Starting with the landowner, loggers create value by logging, merchandising, sorting and transporting WJ to a primary manufacturer (RLMT). The primary manufacturer sells directly to secondary manufacturers, wholesalers/ distributors (e.g., Sustainable NW Wood), retailers (WILCO, Coastal Hardware), and direct to the consumer. Occasionally, a log broker or logger may play a role between the landowner and primary manufacturer (RLMT). The primary manufacturer can access the consumer through the yard, the internet, conferences, craft shows and social media.





#### **WJ Product Transport**

Backhauls are a way for companies to reduce transportation costs. A backhaul is the transport of cargo back from the delivery point to the originating point. In the case of RLMT, the origination point would be the primary manufacturing site (sawmill). Since it costs almost as much time to drive empty as fully loaded, a backhaul makes economic sense, as it helps to pay for the

operating expenses for the trip back to the RLMT location. This strategy works well with companies that are in higher density populations where cargo demand is medium to high. The probability of finding a commodity to backhaul to the Ritter area is low.

However, a partial backhaul may be possible, especially since the target markets for WJ products are in medium to high-density areas. Finding a backhaul to intermediate locations along the return trip to RLMT may be possible. To organize such a backhaul, RLMT should first contact the customer at the delivery point and inquire if they have hauls going in the general direction of Ritter. Inquiring with nearby manufacturers and warehouses may yield opportunities for partial backhauls. Generally, WJ products are quoted F.O.B<sup>4</sup> truck, paid in advance, so freight arrangements are made by the customer purchasing WJ products. This process will limit the potential of developing backhauls. Backhauls are often an opportunistic arrangement and should not be a key strategy for creating value.

## **EMERGING WJ PRODUCT MARKETS**

The emerging WJ product markets represent market sectors that are becoming more widely accepted. Following are some products that are gaining recognition. We also include two product innovations that could in the near term be developed and sold by the Ritter operation.

### **Essential Oils**

WJ essential oils are a concentrated aromatic compound produced from leaves, seeds, barks, roots, sawdust, chips, and the crushing of WJ berries. The oils volatize upon contact with air. Essential oils are recovered from WJ through different methods, such as steam distillation and solvent extraction, depending on the oil quality and the stability of the aromatic components. They can be redistilled and purified for the desired properties of end products. The WJ essential oils aromatic property is appropriate for flavorings in gin, but may have applications in soaps, cosmetic products, air fresheners, floor washers, and cleaners. WJ essential oil is created by steam-distilling sawdust, waste shavings, and chipped logs and branches. In 2015, the size of the essential oil market exceeded \$6 billion. WJ may have an opportunity for a part in this market.

In the late 1990's the Confederated Tribes of the Warm Springs Reservation of Oregon invested in a distiller and processed WJ branches into essential oils. The issue for success is making enough oil to attract buyers. Large markets required much more production than the CTWS plant could provide. A major barrier to entry in the essential oils market is the capital requirement to produce sufficient quantities of oil to satisfy buyers.

There are no essential oil processors within economic transport distance from the Ritter area. Further, the material (shaving, sawdust, branches) that Ritter could possibly ship are of low value and will not bear freight cost for long distance transport. We recommend that Ritter not focus on essential oils now and primarily focus on sawmilling.

 $<sup>^{4}</sup>$  F.O.B. = freight on board.

#### **Other Aromatic Products**

Like eastern red cedar, WJ has a fresh, pleasant aroma that comes from the natural oils found in the wood. WJ provides protection against moths and other insects that can damage natural fibers found in wool, cotton, and other fabric blends. WJ will absorb moisture and unpleasant odors and unlike chemical alternatives, its aroma will quickly dissipate leaving only a fresh, clean scent. Packaging small blocks of WJ for use in drawers, closets, luggage, garment bags, gym bags or any location where fresh juniper scent is valued could be an opportunity to substitute WJ for eastern red cedar. A variation of this product is WJ shavings packaged into sachets.

#### **Feedstock for Advanced Biofuels**

Another emerging market is the use of WJ fiber as feedstock in the production of transportation fuels. Known as advanced biofuels, these liquid fuels typically service commercial sectors for use as renewable diesel or renewable aviation fuel. Red Rock Biofuels (based in Fort Collins, Colorado) is currently developing an advanced biofuels manufacturing facility at Lakeview, Oregon. Red Rock is targeting wood waste (including WJ fiber) for use as feedstock and plans to utilize approximately 140,000 bone dry tons annually to produce 15 million gallons of renewable diesel and aviation fuel. Currently, Red Rock plans to break ground during second quarter 2017, with commercial production planned for fourth quarter 2018.

### **Do-It-Yourself Markets**

Large retailers such as Lowe's and Home Depot have reported rising sales as the housing market continues to grow and Americans become increasingly willing to spend on home-improvement projects. Very low mortgage rates have kept homes within reach of many borrowers and residential property prices have trended upward in many U.S. housing markets over the past few years. Creating products that supply the rising demand for home improvement is an opportunity for potential WJ processors such as RLMT. Innovative products that take advantage of WJ attributes can provide a compelling reason to select this product over conventional products.

An product line that takes advantage of WJ's resistance to rot and insects is a do-it-yourself raised bed kit. The kit would allow the consumer to build the raised bed for use in a backyard garden setting. The package would use standard dimension lumber cut by the RLMT mill, 2"x 6" or 2"x 8" with short sections of 5"x 5" for the corner posts. TSS recommends that after sawmill production is steady and cash flow from production of standard products is realized, RLMT should explore possibilities through the development of raised bed kit prototypes. Once prototypes are developed, make contact with home improvement centers and feed stores as potential buyers.

### WJ PRODUCT MARKETS – OREGON

Interviews with WJ retail and wholesale lumber enterprises confirmed that current market demand for Oregon WJ products is double the supply.<sup>5</sup> Sustainable NW Wood staff estimate

<sup>&</sup>lt;sup>5</sup> Communication with Sustainable NW Wood and Joseph's Juniper.

that they receive about one-half of what could be sold monthly. Interviews confirmed that WJ products with the most consistent demand include standard production 5"x 5", 6"x 6", timbers and 2"x 6", 2"x 8" dimension lumber. In addition round-wood fence post products are in high demand. There are currently five commercial scale WJ processing enterprises located throughout the state of Oregon. Table 1 lists the enterprises along with location and contact information.

ENTERPRISE	LOCATION	PRODUCTS	WEBSITE
		Dimension lumber,	
In The Sticks	Fossil	landscape timbers	http://www.junipersawmill.com/?cat=1
		Dimension lumber,	
		landscape timbers,	
		furniture, decorative	
		wood, custom lumber,	
Joseph's Juniper	Burns	fence posts, firewood	http://josephsjuniperinc.com/
		Dimension lumber,	
		landscape timbers,	
Millwood, LLC	Bend	firewood	http://www.vworksoregon.com/
Levi's Sawmill		Primarily custom	https://www.facebook.com/Levis-Sawmill-
Service	LaPine	lumber production	Services-812252195586968/?ref=page_internal
		Furniture, decorative	
Juniper Guy	LaPine	wood, custom lumber	http://juniperguy.com/

Table 1. Western Juniper Processing Enterprises in Oregon

As these enterprises have matured and WJ lumber markets developed, WJ lumber grading rules have been developed. Appendix A is the latest iteration of grading rules as provided by the Western Juniper Alliance.

### WJ PRODUCT MARKETS – SURROUNDING STATES

Per discussions with WJ lumber market wholesalers, market interest for WJ products is growing in New Mexico, Nevada, Arizona, California, Montana, Idaho and Washington. However, for most standard products, transport costs will limit the ability to compete with local suppliers and competitors. Occasionally, unique, high value products such as furniture (or other products incorporating a craftsman aesthetic appeal) can ship for long distances because the added value is in the uniqueness of the product and how it meets customer demand thus securing a higher market value.

### FINDINGS

### **WJ Manufactured Products**

The market for WJ products appears to be very promising for the type of solid wood products that the Ritter operation can produce (e.g., landscape timbers, dimension lumber, fence posts). Remaining focused on cutting WJ and processing the WJ material for standard markets is prudent. Diversification into many other products should be considered at a later phase. The products that Ritter should focus on are what the markets are demanding today. These products include 5"x 5", 6"x 6", 2"x 6", 2"x 8" lumber and round wood fence post products. By-products produced (slabs) can be bundled (banded) and marketed as firewood. Tables 2 and 3 summarize existing and emerging markets for WJ products.

WJ PRODUCT	COMMENTS
6"x 6" 8 foot	Main product
2"x 6" 8 foot	Standard board, fall down from 6" x 6"
2"x 8" 8 foot	Standard board, fall down from 6" x 6"
Fence posts	Round wood, grouped into 3"/4", 4"/5", 5"/6", and 6"/7" small end diameters
5"x 5" 8 foot	Standard post
2"x 6" 10 foot	Custom cut product
6"x 6" 10 foot	Custom cut product

Table 2. Existing WJ Products Listed by Ranking (High to Low)

#### Table 3. Emerging WJ Products Listed by Ranking (High to Low)

WJ PRODUCT	COMMENTS
DIY Market	Near term market, can use current products from mills
Aromatic market	Near term market, can use mill by-products.

#### Local Markets for WJ Logs and Fiber

Regional markets for both WJ logs and WJ fiber are currently very limited. Interviews with central and eastern Oregon land managers, foresters, and logging contractors confirmed that there are wholesale markets for WJ firewood logs in Tri Cities (Richland, Kennewick, Pasco) and Winnemucca, Nevada. However, due to significant haul costs and very low natural gas prices (consumers seek out low-cost energy), the profit margin for firewood logs is minimal.

WJ fiber markets have traditionally been focused on biomass fuel for power generation. The relatively low moisture content (30%) and high heat value (8,400 Btu/dry pound) of WJ fiber

makes it an attractive fuel for commercial power production. However, the closures of local biomass power plants at Heppner and Prairie City have greatly impacted the local biomass fuel market. There is currently no local market for WJ biomass chips.

Portland General Electric is considering firing the Boardman, Oregon, coal-fired facility on biomass fuel, as PGE has committed to curtail the use of coal fuel by 2020. PGE plans to conduct a test-fire of 100% biomass fuel using torrefied fuel provided by Oregon Torrefaction. Discussions with a representative from Oregon Torrefaction<sup>6</sup> confirmed that PGE plans to fire using torrefied fuel for approximately one day with 8,000 GT. If this goes well, there could be a second trial arranged at approximately 50,000 GT. PGE will likely make a formal decision in 2018 or 2019 regarding long-term sustained use of wood fuel at Boardman. Should PGE decide to proceed with wood fuel usage, Oregon Torrefaction will likely have a processing facility at John Day that would procure wood fiber (possibly including WJ fiber) for processing into torrefied fuel.

<sup>&</sup>lt;sup>6</sup> Matt Krumenauer, Oregon Torrefaction.

Appendix A. Western Juniper Lumber Grading Rules



# Western Juniper Lumber Grading Rules

Updated February 1, 2016

# Western Juniper Lumber Grading Rules – DEFINITIONS

Bark pocket

Bow

Depressions in the surface of the lumber often containing bark from the exterior



The gap in the center of the board when laid on its face



**Crook** The gap in the center of the board when laid on edge



Heart / SapThe red (heart center) of the log<br/>versus the white (sap) that is<br/>between the heart and the bark

Knot holes /A knot that can be moved withLoose knotsa finger, or a hole where a knotonce was





# Western Juniper Lumber Grading Rules – DEFINITIONS

,			/		
+	Acona	ration	of the	arain	





Rot / Punk

A separation of the grain

Rotten, decayed wood



Wane edge Missing fiber caused by the saw missing the taper of the log



# DIMENSIONS:

Length	The length of the rough sawn board or timber
Thickness	The thickness of the rough sawn board or timber
Width	The width of the rough sawn board or timber

# Western Juniper Lumber Grading Rules – LANDSCAPE GRADE

- For use in landscaping, including posts, poles, and landscape timbers
- 2x, 3x, 4x, 5x, and 6x Thicknesses



Bark pocket	Allowed on any face, not to exceed $\frac{1}{2}$ width or thickness
Bow	No more than 1" bow allowed in length of timber
Crook	No more than 1" crook allowed in length of timber
Heart / Sap	Any combination of Heart (red) and Sap ( white)
Knot holes / Loose knots	No more than $\frac{1}{2}$ the thickness or width
Length	Minus o, plus 2"
Rot / Punk	Allowed on any face, not to exceed $\frac{1}{2}$ width or thickness
Split	Allowed up to 6"
Thickness	Thickness to plus or minus 1/16"
Wane edge	Allowed on any edge, not to exceed 32"
Width	Plus or minus 1/16"

# Western Juniper Lumber Grading Rules – SIDING / DECKING GRADE

- For use in remanufacturing of finished products including siding, decking and paneling
- 4/4, 5/4, 6/4, 7/4, 8/4 Lumber
- Graded 1 face 2 edges



Bark pocket	Allowed – no more than $\frac{1}{2}$ the thickness or width
Bow	No more than 2" bow allowed in length of board
Crook	No more than 1" crook allowed in length of board
Heart / Sap	All combinations of Heart/Sap allowed
Knot holes / Loose knots	No more than $\frac{1}{2}$ the thickness or width
Length	Minus o, plus 2"
Rot / Punk	Not allowed
Split	Not allowed
Thickness	Plus or minus 1/16"
Wane edge	Not to exceed $\frac{1}{2}$ the thickness
Width	Plus or minus 1/16"
## Western Juniper Lumber Grading Rules – CUTSTOCK GRADE

- For use in remanufacturing of finished products including mouldings, wainscot and cabinets
- 4/4, 5/4, 6/4, 7/4, 8/4 Lumber
- Graded 1 face 2 edges
- After defect cutting, board must yield 67% (12" cutting minimum)



Bark pocket	Defect
Bow	No more than 2" bow allowed in length of board
Crook	No more than 1" crook allowed in length of board
Heart / Sap	All combinations of Heart / Sap allowed
Knot holes / Loose knots	Defect
Length	Minus o, plus 2"
Rot / Punk	Defect
Split	Defect
Thickness	Plus or minus 1/16"
Wane edge	No more than ½ back edge allowed; Any more than ½ back edge is a defect
Width	Plus or minus 1/16"

## Western Juniper Lumber Grading Rules – MOLDING GRADE

- For use in remanufacturing of finished products including moldings, doors, cabinets and wainscot
- 4/4, 5/4, 6/4, 7/4, 8/4 Lumber
- Graded 1 face 2 edges



Bark pocket	Not allowed
Bow	No more than 2" bow allowed in length of board
Crook	No more than 1" crook allowed in length of board
Heart / Sap	All combinations of Heart/Sap allowed
Knot holes / Loose knots	Not allowed
Length	Minus o, plus 2"
Rot / Punk	Not allowed
Split	Not allowed
Thickness	Plus or minus 1/16"
Wane edge	Not to exceed ½ the back thickness
Width	Plus or minus 1/16"





The Western Juniper Alliance is growing the market for Western Juniper to sustain and cultivate business opportunities. WJA also promotes training programs for a qualified workforce, and makes sure that small businesses have the financial resources they need to grow and create jobs in rural communities.

Learn more: www.westernjuniper.org

# Appendix C. Monthly Cash Flow Projections WJ Removal Enterprise

### Cash flow for Harvest Enterprise – 2017

Year 2017	Monthly Cash F	low for the Har	vest Enterprise											
Annual Cash Flow (\$000)														
, ,		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Operating days per month		10	10	10	10	15	20	20	20	15	10			140
Percentage per month		7%	7%	70/	70/	119/	149/	14%	14%	119/	70/	0%	0%	100%
Fercentage per montin		1 70	1 76	1 70	1 70	1170	144 70	1470	1470	1179	1 70	076	076	100 %
Grant		-												
Owners Investment		372.75												
		372.75												
Revenue														
Juniper Logs		-		-	42.66	42.66	42.66	42.66	42.66	42.66	42.66	42.66	-	
·														
Total Revenue		-	-	-	42.66	42.66	42.66	42.66	42.66	42.66	42.66	42.66	-	341.25
Expenses														
Expenses														
Capital														
Construction														
Equipment		311.25												
Total		311.25												
O&M Expense														
Labor		13.76	13.76	13.76	13.76	20.63	27.51	27.51	27.51	20.63	13.76	-	-	192.59
Annual Maintenance		0.15	0.15	0.15	0.15	0.23	0.30	0.30	0.30	0.23	0.15	-	-	2.10
Major Maintenance		-	-	-	-	-	-	-	-	-	-	-	-	-
Other O & M		1.92	1.92	1.92	1.92	2.88	3.84	3.84	3.84	2.88	1.92	-	-	26.91
Other Operating		2.52	2.52	2.52	2.52	3.77	5.03	5.03	5.03	3.77	2.52	-	-	35.21
Initial Training		0.36	0.36	0.36	0.36	0.54	0.71	0.71	0.71	0.54	0.36	-	-	5.00
Total Expense		18.70	18.70	18.70	18.70	28.05	37.40	37.40	37.40	28.05	18.70	-	-	261.81
Operating Cash Flow		(18.70)	(18.70)	(18.70)	23.96	14.60	5.25	5.25	5.25	14.60	23.96	42.66	-	79.44
Income Tax														
Debt Interest		-	-	-	-	-	-	-	-	-	-	-	-	-
Federal Tax		1.21	1.21	1.21	1.21	1.81	2.42	2.42	2.42	1.81	1.21	-	-	16.91
State Tax		-	-	-	-	-	-	-	-	-	-	-	-	-
Investment Tax Credit		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Tax/Debt Intere-	st	1.21	1.21	1.21	1.21	1.81	2.42	2.42	2.42	1.81	1.21	-	-	16.91
Debt Payment		-	-	-	-	-	-	-	-	-	-	-	-	-
Cashflow		(331.16)	(19.91)	(19.91)	22.75	12.79	2.84	2.84	2.84	12.79	22.75	42.66	-	(248.72
Beginning cash		372.75	41.59	21.68	1.77	24.52	37.31	40.15	42.99	45.83	58.62	81.37	124.03	372.75
Ending cash balance		41.59	21.68	1.77	24.52	37.31	40.15	42.99	45.83	58.62	81.37	124.03	124.03	124.03

#### Cash flow for Harvest Enterprise – 2018

Annai Cash Flow (500)         Jan         Feb         Arr         Arr         May         Jan         Feb         Arr         May         Jan         Arr         May         Sec         Cot         Nov         Dec         Totals           Descripting says per month         0.000         <	Year 2018	Monthly Cast	h Flow for the Har	vest Enterprise	9										
Dimensional service         Jan         Feb         Mar         Agr         May         Jun         Jun         Jun         Nov         Nov         Dec         Totals           Operating per month         0.00         0.	Annual Cash Flow (\$000)														
Opending days per month Personaling per month         10.00         0.01	(****,		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Percentage per month         0.07<	Operating days per month		10.00	10.00	10.00	10.00	15.00	20.00	20.00	20.00	15.00	10.00			140.00
Grant Owners investment         .	Percentage per month		0.07	0.07	0.07	0.07	0.11	0.14	0.14	0.14	0.11	0.07	-	-	
Grant         Orantes	<b>.</b> .														
Owners Investment Total         ·	Grant		-												
Total         · <td>Owners Investment</td> <td></td> <td>-</td> <td></td>	Owners Investment		-												
Revenue Juniper Logs          24.62         24.62         24.62         24.62         36.53         49.24 <td>Total</td> <td></td> <td>-</td> <td></td>	Total		-												
Junper Logs         ·         24.62         34.93         44.924         49.24         49.24         49.24         49.24         36.93         24.62          344.66           Expenses                       344.66           Construction <t< td=""><td>Revenue</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Revenue														
Total Revenue         -         24.62         24.62         24.62         24.62         36.93         49.24         49.24         49.24         36.93         24.62         34.66           Expenses         Capital         Image: Capital <thimage: capital<="" th=""> <thimage: capital<="" th=""></thimage:></thimage:>	Juniper Logs		-	24.62	24.62	24.62	24.62	36.93	49.24	49.24	49.24	36.93	24.62	-	
Expenses         Image: segment segmen	Total Revenue		-	24.62	24.62	24.62	24.62	36.93	49.24	49.24	49.24	36.93	24.62	-	344.66
Exponses Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Capital Construction         Image: Capital Capital Construction         Image: Capital Capital Construction         Image: Capital Capital Capital Capital Construction         Image: Capital C	Expenses														
Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital Construction         Image: Capital C	Europeee														
Capital         Capital         Construction         Capital	Capital														
Construction         Construction<	Capital														
Equipment Total	Construction														
100al	Equipment		-												
OAM Expense         Image: Constraint of the symbol o	Iotai		-												
Labor         113.89         13.89         13.89         20.84         27.79         27.79         20.84         13.89         -         -         194.52           Annual Maintenance         0.16         0.16         0.16         0.16         0.16         0.22         0.32         0.32         0.24         0.16         -         2.21           Major Maintenance         -         -         -         -         -         -         -         -         -         2.03         0.24         0.21         -         2.21         3.88         3.88         3.88         2.91         1.94         -         2.217.18         3.88         3.88         3.88         3.96         2.64         -         -         3.89         3.727         37.27         37.27         27.95         18.63         -         -         -         -         -         -         -         -         -         -         -         -         -         2.60.87         0.01         0.01         0.02         1.03         0.03         0.03         0.03         0.03         1.03         0.01         0.01         0.02         1.03         1.03         0.01         0.01         0.01         0.01         <	O&M Expense														
Annual Maintenance       0.16       0	Labor		13.89	13.89	13.89	13.89	20.84	27.79	27.79	27.79	20.84	13.89	-	-	194.52
Major Maintenance         Image: M	Annual Maintenance		0.16	0.16	0.16	0.16	0.24	0.32	0.32	0.32	0.24	0.16	-	-	2.21
Other O & M         1.94         1.94         1.94         1.94         2.91         3.88         3.88         3.88         2.91         1.94         -         -         2.718           Other O & M         2.64         2.64         2.64         2.64         3.96         5.28         5.28         3.96         2.64         -         -         36.97           Initial Training         - <td>Major Maintenance</td> <td></td> <td>-</td>	Major Maintenance		-	-	-	-	-	-	-	-	-	-	-	-	-
Other operating         2.64         2.64         2.64         2.64         2.64         2.64         2.64         3.96         5.28         5.28         5.28         3.96         2.64         -         2.00         3.00 <t< td=""><td>Other O &amp; M</td><td></td><td>1.94</td><td>1.94</td><td>1.94</td><td>1.94</td><td>2.91</td><td>3.88</td><td>3.88</td><td>3.88</td><td>2.91</td><td>1.94</td><td>-</td><td>-</td><td>27.18</td></t<>	Other O & M		1.94	1.94	1.94	1.94	2.91	3.88	3.88	3.88	2.91	1.94	-	-	27.18
Initial Training         I	Other operating		2.64	2.64	2.64	2.64	3.96	5.28	5.28	5.28	3.96	2.64	-	-	36.97
Total Expense         18.63         18.63         18.63         18.63         18.63         27.95         37.27	Initial Training		-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Cash Flow         (18.63)         5.98         5.98         5.98         (0.33)         (0.34)         11.97         21.29         18.29         24.62         .         83.79           Income Tax         Income Tax <td>Total Expense</td> <td></td> <td>18.63</td> <td>18.63</td> <td>18.63</td> <td>18.63</td> <td>27.95</td> <td>37.27</td> <td>37.27</td> <td>37.27</td> <td>27.95</td> <td>18.63</td> <td>-</td> <td>-</td> <td>260.87</td>	Total Expense		18.63	18.63	18.63	18.63	27.95	37.27	37.27	37.27	27.95	18.63	-	-	260.87
Income Tax         Image: Constraint of the sector of	Operating Cash Flow		(18.63)	5.98	5.98	5.98	(3.33)	(0.34)	11.97	11.97	21.29	18.29	24.62	-	83.79
Debt Interest  <	Income Tax														
Federal Tax         0.61	Debt Interest		-	-	-	-	-	-	-	-	-	-	-	-	-
State Tax Investment Tax Credit         ···	Federal Tax		0.61	0.61	0.61	0.61	0.92	1.23	1.23	1.23	0.92	0.61	-	-	8.60
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	State Tax		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Tax/Debt interest         0.61	Investment Tax Credit		-	-	-	-	-	-	-	-	-	-	-	-	-
Debt Payment         Image: Cash low         Image: Cash l	Total Income Tax/Debt interes	t	0.61	0.61	0.61	0.61	0.92	1.23	1.23	1.23	0.92	0.61	-	-	8.60
Cashflow         (19.2)         5.37         5.37         5.37         (4.25)         (1.57)         10.74         10.74         20.37         17.68         24.62         7.59           Beginning cash         124.03         104.78         110.15         115.52         120.89         116.64         115.07         125.81         136.55         156.92         174.60         199.21         124.03           Ending cash balance         104.78         110.15         115.52         120.89         116.64         115.07         125.81         136.55         156.92         174.60         199.21         129.21	Debt Payment		-	-	-	-	-	-	-	-	-	-	-	-	-
Beginning cash         124.03         104.78         110.15         115.52         120.89         116.64         115.07         125.81         136.55         156.92         174.60         199.21         124.03           Ending cash balance         104.78         110.15         115.52         120.89         116.64         115.07         125.81         136.55         156.92         174.60         199.21         199.21         199.21	Cashflow		(19.25)	5.37	5.37	5.37	(4.25)	(1.57)	10.74	10.74	20.37	17.68	24.62	-	75.19
Ending cash balance 104.78 110.15 115.52 120.89 116.64 115.07 125.81 136.55 156.92 174.60 199.21 199.21 199.21	Beginning cash		124.03	104.78	110.15	115.52	120.89	116.64	115.07	125.81	136.55	156.92	174.60	199.21	124.03
	Ending cash balance		104.78	110.15	115.52	120.89	116.64	115.07	125.81	136.55	156.92	174.60	199.21	199.21	199.21

#### Cash flow for Harvest Enterprise – 2019

Year 2019	Monthly Cash	Flow for the H	larvest Enterpr	ise										
Annual Cash Flow (\$000)	,,													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Operating days per month		10.00	10.00	10.00	10.00	15.00	20.00	20.00	20.00	15.00	10.00			140.00
Percentage per month		0.07	0.07	0.07	0.07	0.11	0.14	0.14	0.14	0.11	0.07	-	-	
Grant		-												
Owners Investment		-												
		-												
Revenue														
Juniner Logs		-	24.86	24.86	24.86	24.86	37.30	49.73	49.73	49.73	37.30	24.86	-	
oumper Loga			24.00	24.00	24.00	24.00	01.00	40.70	40.70	40.70	01.00	24.00		
Total Revenue		-	24.86	24.86	24.86	24.86	37.30	49.73	49.73	49.73	37.30	24.86	-	348.11
Expenses														
Expenses														
Capital														
Construction														
Equipment		-												
Total		-												
O&M Expense														
Labor		14.03	14.03	14.03	14.03	21.05	28.07	28.07	28.07	21.05	14.03	-	-	196.46
Annual Maintenance		0.17	0.17	0.17	0.17	0.25	0.33	0.33	0.33	0.25	0.17	-	-	2.32
Major Maintenance		-	-	-	-	-	-	-	-	-	-	-	-	-
Other O & M		1.96	1.96	1.96	1.96	2.94	3.92	3.92	3.92	2.94	1.96	-	-	27.45
Other Operating		2.77	2.77	2.77	2.77	4.16	5.55	5.55	5.55	4.16	2.77	-	-	38.82
Initial Training		-	-	-	-	-	-	-	-	-	-	-	-	-
I otal Expense		18.93	18.93	18.93	18.93	28.40	37.86	37.86	37.86	28.40	18.93	-	-	265.05
Operating Cash Flow		(18.93)	5.93	5.93	5.93	(3.53)	(0.57)	11.87	11.87	21.33	18.37	24.86	-	83.06
Income Tax														
Debt Interest		-	-	-	-	-	-	-	-	-	-	-	-	-
Federal Tax		0.91	0.91	0.91	0.91	1.37	1.82	1.82	1.82	1.37	0.91	-	-	12.74
State Tax		-	-	-	-	-	-	-	-	-	-	-	-	-
Investment Tax Credit		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Tax/Debt interes	t	0.91	0.91	0.91	0.91	1.37	1.82	1.82	1.82	1.37	0.91	-	-	12.74
D-M D														
Debt Payment		-	-	-	-	-	-	-	-	-	-	-	-	-
Cashflow		(19.84)	5.02	5.02	5.02	(4.90)	(2.39)	10.05	10.05	19.97	17.46	24.86	-	70.32
Beginning cash		199.21	179.37	184.40	189.42	194.44	189.54	187.15	197.20	207.25	227.21	244.67	269.53	199.21
Ending cash balance		179.37	184.40	189.42	194.44	189.54	187.15	197.20	207.25	227.21	244.67	269.53	269.53	269.53

# Appendix D. Monthly Cash Flow Projections WJ Processing Enterprise

### Cash flow for the Processing Operation – Year 2017

Year 2017														
Annual Cash Flow (\$000)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Sawmill operating days per month	0	0	0	20	20	20	20	20	20	20	20	0	160
		0	0	0	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	0%	100%
Grant		0.00												
Owners Investment		340.82 340.82												
Revenue														0.00
Lumber						63.60	63.60	63.60	63.60	63.60	63.60	63.60	63.60	508.80
Firewood						7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	56.00
Slabwood						8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	70.40
Roundwood						9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	76.32
Total Revenue		0.00	0.00	0.00	0.00	88.94	88.94	88.94	88.94	88.94	88.94	88.94	88.94	711.52
Expenses														
Capital														
Construction		35.82	35.82	35.82										107.47
Equipment			153.35											153.35
Total		35.82	189.17	35.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	260.82
Operating														
Sawlogs					42.66	42.66	42.66	42.66	42.66	42.66	42.66	42.66	0.00	341.25
Labor					23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	0.00	185.55
Annual Maintenance					0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.00	2.10
Major Maintenance					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other O & M					4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	0.00	35.68
Other operating					3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	0.00	31.20
Initial training					1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	0.00	10.00
Total Expense		0.00	0.00	0.00	75.72	75.72	75.72	75.72	75.72	75.72	75.72	75.72	0.00	605.78
Operating Cashflow		0.00	0.00	0.00	-75.72	13.22	13.22	13.22	13.22	13.22	13.22	13.22	88.94	105.74
Income Tax						0.00								
Debt Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Federal Tay		0.00	0.00	0.00	0.00	0.00	0.00	10.55	0.00	0.00	10.55	0.00	10.55	31.64
State Tax		0.00	0.00	0.00	0.00	0.00	0.00	1.99	0.00	0.00	1 99	0.00	1 99	5.97
Investment Tax Credit		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Income Tax		0.00	0.00	0.00	0.00	0.00	0.00	12.54	0.00	0.00	12.54	0.00	12.54	0.00
Dalah Bermanat														0.00
Debt Payment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cashflow		-35.82	-189.17	-35.82	-75.72	13.22	13.22	0.68	13.22	13.22	0.68	13.22	76.40	-192.68
Beginning cash		340.82	305.00	115.82	80.00	4.28	17.50	30.71	31.39	44.61	57.83	58.51	71.73	340.82
Ending cash balance		305.00	115.82	80.00	4.28	17.50	30.71	31.39	44.61	57.83	58.51	71.73	148.13	148.13

### Cash flow for the Processing Operation – Year 2018

Year 2018														
Annual Cash Flow (\$000)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Sawmill operating days per month	oun	100		20	20	20	20	20	20	20	20	0	160
	Percentage			-										
	per month	0	c	0	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	0.00%	100%
Grant		0												
Additional Owners Investment		0												
Total		0												
Revenue														
Lumber						64.24	64.24	64.24	64.24	64.24	64.24	64.24	64.24	513.89
Firewood						7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07	56.56
Slabwood						8.89	8.89	8.89	8.89	8.89	8.89	8.89	8.89	71.10
Roundwood						9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	77.08
Total Revenue		0.00	0.00	0.00	0.00	89.83	89.83	89.83	89.83	89.83	89.83	89.83	89.83	718.64
Expenses														
Capital														
Construction														0.00
Equipment			0.00	1										0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operating														
Sawlogs					43.08	43.08	43.08	43.08	43.08	43.08	43.08	43.08	0.00	344.66
Labor					23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	0.00	187.41
Annual Maintenance					0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.00	2.21
Major Maintenance					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other O & M					4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	0.00	36.03
Other operating					4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	0.00	32.76
Initial training					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Expense		0.00	0.00	0.00	75.38	75.38	75.38	75.38	75.38	75.38	75.38	75.38	0.00	603.07
Operating Cashflow		0.00	0.00	0.00	-75.38	14.45	14.45	14.45	14.45	14.45	14.45	14.45	89.83	115.57
Income Tax														
						0.00								
Debt Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Federal Tax		0.00	0.00	0.00	0.00	0.00	0.00	9.57	0.00	0.00	9.57	0.00	9.57	28.70
State Tax		0.00	0.00	0.00	0.00	0.00	0.00	1.94	0.00	0.00	1.94	0.00	1.94	5.81
Investment Tax Credit		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
														0.00
Total Income Tax		0.00	0.00	0.00	0.00	0.00	0.00	11.50	0.00	0.00	11.50	0.00	11.50	34.50
														0.00
Debt Payment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cashflow		0.00	0.00	0.00	-75.38	14.45	14.45	2.94	14.45	14.45	2.94	14.45	78.33	81.06
Paginging coch		440.40	440.40	440.40	440.40	70.70	07.00	101.01	404.50	440.00	400.40	400.40	450.07	140.40
Beginning cash		148.13	148.13	148.13	148.13	/2.75	87.20	101.64	104.59	119.03	133.48	136.42	150.87	146.13
Ending cash balance		146.13	146.13	146.13	/2./5	67.20	101.64	104.58	119.03	133.48	136.42	150.87	229.20	229.20

## Cash flow for the Processing Operation – Year 2019

Annual Cash Flow (2000)         Same in the second of	Year 2019														
Saemili dor, dor, dor, Allower         Saemili dor, dor, and Allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, and allower         Saemili dor, dor, dor, dor, dor, dor, dor, dor,	Annual Cash Flow (\$000)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
meetings         0<		Sawmill operating days per	_		_										
pertundage pertundage         no           Gent         and		month	0	0	0	20	20	20	20	20	20	20	20	0	160
Gart         Gart         Core         Core <th< th=""><td></td><td>per month</td><td>0</td><td>0</td><td>0</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>12.50%</td><td>0.00%</td><td>100%</td></th<>		per month	0	0	0	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	0.00%	100%
Gent         Additional Denses Investment         Additinvestment         Additinvestment         Add															
Grant         Addreid         Ome         Image         Image <th< th=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>															
Additional barrer investment         O         F	Grant		0												
Revenue         O         O         Formal	Additional Owners Investment		0												
Revname         Image: state of the st			0												
Revenue         Image         <	_														
Limber         Limber         0.48         04.88 <t< th=""><td>Revenue</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td></t<>	Revenue														0
Presunced         L <thl< th="">         L         <thl< th=""> <thl< t<="" th=""><td>Lumber</td><td></td><td></td><td></td><td></td><td></td><td>64.88</td><td>64.88</td><td>64.88</td><td>64.88</td><td>64.88</td><td>64.88</td><td>64.88</td><td>64.88</td><td>519.03</td></thl<></thl<></thl<>	Lumber						64.88	64.88	64.88	64.88	64.88	64.88	64.88	64.88	519.03
Sabovidod         Bab         B	Firewood						7.14	7.14	/.14	7.14	7.14	/.14	7.14	7.14	57.13
Nourboold         0.00         0.00         0.00         0.00         0.00         0.013         0.00         0.00	Siabwood						8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	71.82
Idam         Code         Code         Code         Code         Code         Code         Code         Solo         Solo <th< th=""><td>Roundwood Total Devenue</td><td></td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>9.73</td><td>9.73</td><td>9.73</td><td>9.73</td><td>9.73</td><td>9.73</td><td>9.73</td><td>9.73</td><td>705.00</td></th<>	Roundwood Total Devenue		0.00	0.00	0.00	0.00	9.73	9.73	9.73	9.73	9.73	9.73	9.73	9.73	705.00
Expanses         Construction	Total Revenue		0.00	0.00	0.00	0.00	90.73	90.73	90.73	90.73	90.73	90.75	90.73	90.73	123.02
CopyII         Construction	Evnenses														
Construction         Construction<	Capital														
Equipment $0.00$ $0.$	Construction														0.00
Total         0.00 <t< th=""><td>Equipment</td><td></td><td></td><td>0.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0.00</td></t<>	Equipment			0.00											0.00
Char	Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operating Sawlogs															
Savog <sup>5</sup> Constraint         Constraint <thconstraint< th="">         Constraint         Constraint</thconstraint<>	Operating														
Labor         Control         Control <thc< th=""><td>Sawlogs</td><td></td><td></td><td></td><td></td><td>43.51</td><td>43.51</td><td>43.51</td><td>43.51</td><td>43.51</td><td>43.51</td><td>43.51</td><td>43.51</td><td>0.00</td><td>348.11</td></thc<>	Sawlogs					43.51	43.51	43.51	43.51	43.51	43.51	43.51	43.51	0.00	348.11
Annual Maintenance         Major Maintenance         Major Maintenance         0.29 <th0.29< th=""><td>Labor</td><td></td><td></td><td></td><td></td><td>23.66</td><td>23.66</td><td>23.66</td><td>23.66</td><td>23.66</td><td>23.66</td><td>23.66</td><td>23.66</td><td>0.00</td><td>189.28</td></th0.29<>	Labor					23.66	23.66	23.66	23.66	23.66	23.66	23.66	23.66	0.00	189.28
Major Maintenance         Major Maintenance         Major Maintenance         0.10	Annual Maintenance					0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.00	2.32
Other op 8 M         Image M	Major Maintenance					0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.80
Other operating         Constraint operating <thconstraint operating<="" th="">         Constraint oper</thconstraint>	Other O & M					4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	0.00	36.39
Initial training         Index	Other operating					4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	0.00	34.40
Total Expense         0.00         0.00         0.00         76.41	Initial training					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operating Cashflow         Operating Cash Flow         Operating Cash F	Total Expense		0.00	0.00	0.00	76.41	76.41	76.41	76.41	76.41	76.41	76.41	76.41	0.00	611.30
Operating Cashflow         0.00         0.00         0.00         0.00        76.41         14.32															
Income Tax         Image: Constraint of the sector of	Operating Cashflow		0.00	0.00	0.00	-76.41	14.32	14.32	14.32	14.32	14.32	14.32	14.32	90.73	114.52
Debt Interest         O         <	Income Tax														
Debt minerest         0.00	Debt Internet		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
react         0.00         0.00         0.00         0.00         0.00         0.00         10.11         0.00	Debt Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
State Tax         0.00	Federal Tax		0.00	0.00	0.00	0.00	0.00	0.00	10.11	0.00	0.00	10.11	0.00	10.11	30.32
Investment ax credit       0.00 <th< th=""><td>State Tax</td><td></td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>2.03</td><td>0.00</td><td>0.00</td><td>2.03</td><td>0.00</td><td>2.03</td><td>0.10</td></th<>	State Tax		0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.00	0.00	2.03	0.00	2.03	0.10
Total Income Tax       0.00       0.0	Investment Tax Credit		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal media         Coal me	Total Income Tax		0.00	0.00	0.00	0.00	0.00	0.00	12.14	0.00	0.00	12.14	0.00	12.14	36.42
Debt Payment         0.00	Total moone tax		0.00	0.00	0.00	0.00	0.00	0.00	12.14	0.00	0.00	12.14	0.00	12.14	0.00
Cashflow	Debt Payment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cashflow         0.00         0.00         -76.41         14.32         14.32         2.17         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32         14.32 <th14.31< th=""> <th14.31< th=""> <th14.31< th=""></th14.31<></th14.31<></th14.31<>															
Beginning cash         229.20         229.20         229.20         229.20         152.78         167.10         181.41         183.59         197.90         212.22         214.39         228.71         229.20           Ending cash balance         229.20         229.20         152.78         167.10         181.41         183.59         197.90         212.22         214.39         228.71         229.20	Cashflow		0.00	0.00	0.00	-76.41	14.32	14.32	2.17	14.32	14.32	2.17	14.32	78.59	78.10
Ending cash balance 229.20 229.20 229.20 152.78 167.10 181.41 183.59 197.90 212.22 214.39 228.71 307.30 307.30	Beginning cash		229,20	229,20	229,20	229,20	152.78	167.10	181,41	183.59	197.90	212.22	214.39	228.71	229.20
	Ending cash balance		229.20	229.20	229.20	152.78	167.10	181.41	183.59	197.90	212.22	214.39	228.71	307.30	307.30

# Appendix E. Grant County Development Code Multiple Use Range Zone

### ARTICLE 66 - MULTIPLE USE RANGE ZONE, MUR-160(320)

#### 66.010 - PURPOSE

The MUR-160(320) Zone is applied to those agricultural and agricultural/low or nonproductive forest lands of the County dominated by and managed primarily for range and grazing uses, and to establish criteria and standards for applicable farm and/or forest uses and related and supportive uses deemed appropriate and necessary.

The MUR Zone is intended to guarantee the right to conduct normal farm practices and to facilitate and encourage resource management activity. Normal resource management practices shall not be considered a nuisance condition in an MUR Zone or bordering Zones. Nothing in this regulation is intended to interfere with normal resource management practices that might result in conditions such as noise, dust or odor. Residents of this Zone should recognize that the intent of the Zone is to protect resource activities and that in the event of a conflict between residential use and resource practices, this Code will be interpreted in favor of the resource practice.

#### 66.020 - OUTRIGHT USES

The following uses shall be allowed outright:

- A. Agriculture, farming, and related farm use including indoor animal husbandry and the boarding and breeding of horses; (no permit)
- B. The propagation or harvesting of a forest product; (no permit)
- C. The creation of, restoration of, or enhancement of wetlands.

#### 66.030 - PERMITTED USES

The following uses and their accessory uses shall be permitted using a Type I Review Procedure as specified in Section 22.030, and to the standards set out in Section 66.095 when applicable:

- A. Replacement dwelling to be used in conjunction with farm use if the existing dwelling has been listed in a county inventory as historic property as defined in ORS 358.480;
- B. Alteration, restoration or replacement of an existing lawfully established dwelling that:
  - 1. Has intact exterior walls and roof structure;

- 2. Has indoor plumbing consisting of a kitchen sink, toilet and bathing facilities connected to a sanitary waste disposal system;
- 3. Has interior wiring for interior lights;
- 4. Has a heating system; and
- 5. The old dwelling shall be removed, demolished or converted into an allowable non-residential use within three months of the completion of the replacement dwelling.
- 6. If the applicant has requested a deferred replacement permit, the existing dwelling shall be removed or demolished within three months after the deferred replacement permit is issued. A deferred placement permit allows construction of the replacement dwelling at any time. If, however, the established dwelling is not removed or demolished within three months after the deferred replacement permit is issued, the permit becomes void. The replacement dwelling must comply with applicable building codes, plumbing codes, sanitation codes and other requirements relating to health and safety or to siting at the time of construction. A deferred replacement permit may not be transferred, by sale or otherwise, except by the applicant to the spouse or child of the applicant.
- C. A Residential Home in accordance with Section 11.030, in an existing building;
- D. Signs;
- E. Accessory buildings, including private garage or carport, guest house, personal use shop, personal storage building, boat landings and docks for personal use or other similar building located:
  - 1. On the same lot or parcel as the principal farm dwelling; or
  - 2. On the same tract as the principal farm dwelling when the lot or parcel on which the accessory building will be sited is consolidated into a single parcel with all other contiguous lots and parcels in the tract.
- F. Climbing and passing lanes within the right-of-way existing as of July 1, 1987;

- G. Reconstruction or modification of public roads and highways, not including the addition of travel lanes, where no removal or displacement of buildings would occur, or no new land parcels would result;
- H. Temporary public road and highway detours that will be abandoned and restored to original condition or use at such time as no longer needed;
- I. Minor betterment of existing public road and highway related facilities such as maintenance yards, weight stations and rest areas, within right-of-way existing as of July 1, 1987, and contiguous public-owned property utilized to support the operation and maintenance of public roads and highways;
- J. Operations for the exploration of minerals.

#### 66.040 - ADMINISTRATIVE PERMIT USES

The following uses and their accessory uses are permitted as an Administrative Permit under Article 43, processed as a Type II Review Procedure under Section 22.040 subject to the criteria set out in Section 66.060, and shall meet the standards set out in Section 66.095 when applicable:

- A. Home Occupation subject to the provisions of Article 92;
- B. The propagation, cultivation, maintenance and harvesting of aquatic species;
- C. Dog kennels;
- D. A facility for the primary processing of forest products
  - 1. The approval period for the permit shall be one year which is renewable;
  - 2. The facilities are intended to be portable or temporary in nature;
  - 3. The primary processing of forest products means the use of a portable chipper or stud mill or other similar methods of initial treatment of a forest product in order to enable its shipment to market;
  - 4. Forest products means timber grown on the parcel of land or contiguous land where the primary processing facility is located.

- E. Utility facilities necessary for public service, except commercial facilities for the purpose of generating power for public use by sale.
- F. Reconstruction or modification of public roads and highways involving the removal or displacement of buildings, but not resulting in the creation of new land parcels;
- G. Improvement of public road and highway related facilities such as maintenance yards, weight stations and rest areas, where additional right-of-way is required, but not resulting in the creation of new land parcels;
- H. Construction of additional passing and travel lanes requiring the acquisition of right-ofway, but not resulting in the creation of new land parcels;
- I. Roads, highways and other transportation facilities and improvements not allowed under Sections 66.030, 66.040, and 66.050 may be established subject to:
  - 1. Adoption of an exception to Goal 3 and to any other applicable statewide planning goal with which the facility or improvement does not comply; or
  - 2. Other uses which will be established by OAR subject to Section 66.060;
- J. Farm dwellings meeting the criteria of this Ordinance.
- K. Land application of reclaimed water, agricultural or industrial process water or biosolids for agricultural, horticultural, or silvicultural production, or for irrigation in connection with a use allowed in the Multiple Use Range Zone. This is subject to the issuance of a license, permit or other approval from the Department of Environmental Quality.

#### MUR ZONE, SECTION 66.050 - CONDITIONAL USES

The following uses and their accessory uses are permitted as a Conditional Use subject to the issuance of a Conditional Use Permit as per Article 46 subject to criteria set out in Section 66.060, processed as a Type II Review Procedure under Section 22.040 unless otherwise specified, and shall meet the standards set out in Section 66.095 when applicable:

- A. Winery;
- B. Farm stands, if:

- 1. The structures are designed and used for the sale of farm crops and livestock grown on farms in the local agricultural area, including the sale of retail incidental items and fee-based activity to promote the sale of farm crops or livestock, if the sales of the incidental items make up no more than 25% of the total annual sales of the farm stand; and
- 2. The farm stand does not include structures designed for occupancy as a residence or for activities other than the sale of farm crops and livestock and does not include structures for banquets, public gatherings or public entertainment.
- 3. "Farm crops or livestock" includes both fresh and processed farm crops and livestock grown on the farm operation, or grown on the farm operation and other farm operations in the local agricultural area. "Processed crops and livestock" includes jams, syrups, apple cider, animal products and other similar farm crops and livestock that have been processed and converted into another product, but not prepared food items.
- 4. "Local Agricultural Area" includes Oregon or an adjacent county in Washington, Idaho, Nevada or California that borders the Oregon county in which the farm stand is located.
- C. Commercial activities that are in conjunction with farm uses;
- D. Public or private schools subject to the following criteria:
  - 1. Must be located more than three miles from an Urban Growth Boundary; or
  - 2. If located within three miles from an Urban Growth Boundary, then an exception to the State Goals must be taken.
- E. Churches, which may include a parsonage and a cemetery in conjunction with the church subject to the following criteria:
  - 1. Must be located more than three miles from an Urban Growth Boundary; or
  - 2. If located within three miles from an Urban Growth Boundary, then an exception to the State Goals must be taken.
- F. Destination Resort; (Planning Commission Review). See Article 96.

- G. Private parks, playgrounds, hunting and fishing preserves, and campgrounds.
  Campgrounds must be established on a site or be contiguous to lands with a park or other outdoor natural amenity that is accessible for recreational use by the occupants of the campground. Except on a lot or parcel contiguous to a lake or reservoir, private campgrounds shall not be allowed within 3 miles of an Urban Growth Boundary. The campground shall be designed and integrated into the rural agricultural and forest environment in a manner that protects the natural amenities of the site and provides buffers of exiting native trees and vegetation or other natural features between campsites. Campgrounds under this section shall not include intensively developed recreational uses such as swimming pools, tennis courts, retail store or gas stations.
  - 1. Campsites may be occupied by a tent, travel trailer, yurt or recreational vehicle. Separate sewer, water or electric service hook-ups shall not be provided to individual camp sites except that electrical service may be provided to yurts allowed for by this section.
  - 2. Subject to approval by the Planning Commission, a private campground may provide yurts for overnight camping. No more than one-third or a maximum of 10 campsites, whichever is smaller, may include a yurt. The yurt shall be located on the ground or on a wood floor with no permanent foundation.
- H. Public parks, playgrounds, and community centers owned and operated by a governmental agency or a nonprofit community organization;
- I. Golf courses;
- J. Personal use landing strips for airplanes and helicopter pads;
- K. Operations for the exploration for and production of geothermal resources as defined by ORS 522.005 and oil and gas as defined by ORS 520.005, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the wellhead;
- L. Operations conducted for mining, crushing, stockpiling, and processing of aggregate into asphalt or portland cement and other mineral resources and other subsurface resources subject to ORS 215.298, including geothermal resources as defined by ORS 522.005, and oil and gas as defined by ORS 520.005 not otherwise permitted by OAR 660-33.120;
- M. Commercial utility facilities for the purpose of generating power for public use by sale subject to the following criteria:

- 1. The facility shall not preclude more than 20 acres from use as a commercial agricultural enterprise; or
- 2. If the facility will preclude more than 20 acres from use as a commercial agricultural enterprise, an exception shall be taken.
- N. Television, microwave and radio communication facilities and transmission towers.
- O. A site for the disposal of solid waste approved by the governing body of a city or county or both and for which a permit has been granted under ORS 459.245 by the Department of Environmental Quality together with equipment, facilities or buildings necessary for its operation.
- P. A guest ranch in conjunction with an existing and continuing livestock operation, using accepted livestock practices, on the same parcel as the dwelling of the person conducting the operation, under the following conditions:
  - 1. The guest ranch shall be located on a lawfully created parcel that is at least 160 acres, and not identified as high-value farmland as defined in ORS 214.710. The lodge, bunkhouse or cottages cumulatively shall include not less than 4 or more than 10 overnight guest rooms and shall not exceed a total of 12,000 square feet in floor area.
    - a. For each doubling of the initial 160 acres up to 5 additional overnight guest rooms and 2,000 square feet of floor area may be added to the guest ranch for a total of not more than 25 guest rooms and 21,000 square feet of floor area.
  - 2. Food services shall be incidental to the operation of the guest ranch and shall be provided only for the guests of the guest ranch. The cost of meals provided to the guests shall be included as part of the fee to visit or stay at the guest ranch.

#### 66.055 - TEMPORARY USES

The following uses and their accessory uses are permitted as a Temporary Use under Article 44, processed using the review procedures specified for the type of Temporary Use in that Article and shall be subject to meet the standards set out in Section 66.095 when applicable:

A. One manufactured dwelling in conjunction with an existing dwelling for the term of a hardship suffered by the existing resident or a relative of the resident as provided in ORS 215.283(2)(1).

#### SECTION 66.060 - REVIEW CRITERIA

Applications for an Administrative Permit or a Conditional Use Permit in an MUR Zone shall be reviewed against the following criteria in addition to those enumerated in Sections 43.030 and 46.030 as applicable:

- A. The use will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use;
- B. The use will not significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use;
- C. A written statement will be recorded with the deed which recognizes the rights of adjacent and nearby land owners to conduct farm operations and that agricultural and forest uses for lands zoned for resource use have priority over all land uses.

#### 66.070 – DWELLINGS

Single family or manufactured dwelling may be allowed using a Type II Review Procedure as set out in Section 22.040. Dwellings shall meet the standards set out in Section 66.095 when applicable and may be allowed as follows:

- A. Dwellings customarily provided in conjunction with farm use as defined in ORS Chapter 215.203(2) must meet one of the following tests:
  - 1. Test 1 Minimum Size. A dwelling may be considered customarily provided in conjunction with farm use if:
    - a. The parcel on which the dwelling will be located is at least 320 acres; and
    - The subject tract is currently employed for farm use, as defined in ORS 215.203, where the day to day activities on the subject land are principally directed to the farm use of the land; and
    - c. Except as permitted in ORS 215.213 (1)(r) and 215.283 (1)(p) (1999 Edition) there is no other dwelling on the subject tract; and

- d. The dwelling will be occupied by a person or persons who will be principally engaged in the farm use of land, such as planting, harvesting, marketing or caring for livestock, at a commercial scale; and
- e. The parcel is not considered high-value farmland.
- 2. Test 2 Production Capability. A dwelling may be considered customarily provided in conjunction with farm use if:
  - a. The subject tract is at least as large as the median size of those commercial farm or ranch tracts capable of generating at least \$10,000 in annual gross sales that are located within a study area which includes all tracts wholly or partially within one mile from the perimeter of the subject tract; and
  - b. The subject tract is capable of producing at least the median level of annual gross sales of county indicator crops as the same commercial farm or ranch tracts used to calculate the tract size in Section 66.070(A)(2)(a); and
  - c. The subject tract is currently employed for a farm use, as defined in ORS 215.203, at a level capable of producing the annual gross sales required in Section 66.070(A)(2)(a); and
  - d. Notwithstanding Section 66.070(A)(2)(a), the subject lot or parcel on which the dwelling is proposed is not less than 10 acres; and
  - e. Except as permitted in ORS 215.213 (1)(r) and 215.283 (1)(p) (1999 Edition), there is no other dwelling on the subject tract; and
  - f. If no farm use has been established at the time of application, land use approval shall be subject to a condition that no building permit may be issued prior to the establishment of the farm use required by Section 66.070(A)(2)(c); and
  - g. The parcel is not considered high-value farmland.
- 3. Test 3 Actual Income. A dwelling may be considered customarily provided in conjunction with farm use if:

- a. On a tract not defined as high value farmland, the subject tract is currently employed for the farm use, as defined in ORS 215.203, that produced in the last two years or three of the last five years the lower of the following:
  - (1) At least \$40,000 in gross annual income from the sale of farm products; or
  - (2) Gross annual income of at least the midpoint of the median income range of gross annual sales for farms in the county with gross annual sales of \$10,000 or more according to the 1992 Census of Agriculture, Oregon; or
- b. On a tract defined as high value farmland, the subject tract is currently employed for the farm use, as defined in ORS 215.203, that produced at least \$80,000 in gross annual income from the sale of farm products in the last two years or three of the last five years; and
- c. Except as permitted in ORS 215.213 (1)(r) and 215.283 (1)(p) (1999
   Edition), there is no other dwelling on lands designated for exclusive farm use pursuant to ORS Chapter 215 or for mixed farm/forest use pursuant to OAR 660-006-057 owned by the farm or ranch operator or on the farm or ranch operation; and
- d. The dwelling will be occupied by the person or persons who produced the commodities which grossed the income in Section 66.070(A)(3)(a) or (b); and
- e. In determining the gross income required by Section 66.070(A)(3)(a) or
  (b), the cost of purchased livestock shall be deducted from the total gross income attributed to the farm or ranch operation; and
- f. Gross Farm Income earned from a lot or parcel which has been used previously to qualify another lot or parcel for the construction or siting of a primary farm dwelling may not be used; and
- g. An owner of tracts of land which are not contiguous, but are in the same or adjacent county(s) and which are zoned for farm use, may use the gross income generated on this parcels to meet the gross income requirements:

- The owner who qualifies under this provision shall submit proof of covenants, conditions and restriction for the tracts on a form consistent with OAR 660-033-0135(9)(a); and
- (2) The covenants, conditions and restrictions are irrevocable unless a statement of release is signed by an authorized representative of the county or counties where the property is located; and
- Enforcement of the covenants, conditions and restrictions may be undertaken by the Department of Land Conservation and Development or by the county or counties where the property subject to the covenants, conditions and restrictions is located.
- B. An additional dwelling may be located on the same lot or parcel as the dwelling of the farm operator, which will be occupied by a relative, which means grandparent, grandchild, parent, child, brother or sister of the farm operator or the farm operator's spouse, whose assistance in the management of the farm use is or will be required by the farm operator. The dwelling shall be reviewed against the following criteria:
  - 1. The subject farm or ranch is currently employed for farm use, as defined in ORS 215.203;
  - 2. The dwelling will be occupied by relatives who will be principally engaged in the farm use of land, such as planting, harvesting, marketing or caring for livestock, at a commercial scale;
  - 3. There is no other dwelling on the subject farm or ranch that is vacant or currently occupied by persons not working on the subject farm or ranch and could reasonably be used as the requested farm or ranch dwelling; and
  - 4. Meets the following criteria which define a "commercial agricultural enterprise":
    - a. Will contribute in a substantial way to the area's existing agricultural economy; and
    - b. Will help maintain agricultural processors and established farm markets; and
    - c. The evaluation shall consider not only what is produced, but how much and how it is to be marketed.

- C. One single family residential dwelling not provided in conjunction with commercial farm use, based on findings demonstrating that all of the following criteria are met:
  - 1. The dwelling is compatible with farm uses described in ORS 215.203(2) and is consistent with the intent and purposes set forth in ORS 215.243. If the parcel is under forest assessment, the dwelling must be compatible with forest practices as described in ORS 527.620(6);
  - 2. The dwelling does not interfere seriously with accepted farming practices as defined in ORS 215.203(2)(c), on adjacent lands devoted to farm use. If the parcel is under forest assessment, the dwelling must not seriously interfere with forest practices as described in ORS 527.620(6);
  - 3. Does not materially alter the overall land use patterns in the area. To address this standard the County shall:
    - a. Identify a study area for the cumulative impacts analysis. The study area shall include at least 2,000 acres or a smaller area not less than 1,000 acres, if the smaller area is a distinct agricultural area based on topography, soil types, land use pattern, or the type of farm or ranch operations or practices that distinguish it from other, adjacent agricultural areas. Findings shall describe the study area, its boundaries, the location of the subject parcel within this area, why the selected area is representative of the land use pattern surrounding the subject parcel and is adequate to conduct the analysis required by this standard. Lands zoned for rural residential or other urban or non-resource uses shall not be included in the study area.
    - b. Identify within the study area the broad types of farm uses (irrigated or non-irrigated crops, pasture or grazing lands), the number, location and type of existing dwellings (farm, non-farm, hardship etc.), and the dwelling development trends since 1993. Determine the potential number of non-farm/lot of record dwellings that could be approved, including identification of predominant soil classifications, the parcels created prior to January 1, 1993, and the parcels larger than the minimum lot size that may be divided to create new parcels for non-farm dwellings under ORS 215.263 (4). The findings shall describe the existing land use pattern of the study area including the distribution and arrangement of existing uses

and the land use pattern that could result from approval of the possible non-farm dwellings under this subparagraph.

- c. Determine whether approval of the proposed non-farm/lot of record dwellings, together with existing non-farm dwellings will materially alter the stability of the land use pattern in the area. The stability of the land use pattern will be materially altered if the cumulative effect of existing and potential non-farm dwellings will make it more difficult for the existing types of farms in the area to continue operation due to diminished opportunities to expand, purchase or lease farmland, acquire water rights or diminish the number of tracts or acreage in farm use in a manner that will destabilize the overall character of the study area.
- 4. Demonstrate that the dwelling will be situated upon generally unsuitable land for the production of farm crops and livestock, considering the terrain, adverse soil or land conditions, drainage and flooding, vegetation, location and size of tract. If the parcel is under forest assessment, the dwelling shall be situated upon generally unsuitable land for the production of merchantable tree species recognized by the Forest Practices Rules considering the terrain, adverse soil or land conditions, drainage and flooding, vegetation, location and size of the parcel. A lot or parcel or portion of a lot or parcel is not "generally unsuitable" simply because it is too small to be farmed or used for forest management, profitably by itself. If a lot or parcel or portion of a lot or parcel can be sold, leased, rented or otherwise managed as part of a commercial farm, ranch, or forest operation, then the lot or parcel or portion of the lot or parcel is not "generally unsuitable". A lot or parcel or portion of a lot or parcel is presumed to be suitable if, in Eastern Oregon, it is composed predominantly of Class I-VI soils. Just because a lot or parcel or portion of a lot or parcel is unsuitable for one farm use does not mean it is not suitable for another farm use.
- 5. If the application for a non-farm dwelling involves the creation of a new lot or parcel for the non-farm dwelling, the county shall consider whether creation of the parcel will lead to the creation of other non-farm parcels to the detriment of agriculture in the area.
- 6. Submit proof that the lot or parcel has been disqualified for special assessment under ORS 388.370 pursuant to the requirement of ORS 215.236;
- 7. If a dwelling is established on a lot, parcel or tract, no additional dwelling may be sited on the same lot, parcel or tract;

- 8. A written statement consistent with Section 66.060(C) will be recorded with the deed;
- 9. The dwelling is sited to satisfy the siting standards listed in Section 66.080;
- D. A dwelling may be sited under the following provisions as a limited lot of record: (Type I Review)
  - 1. The lot or parcel must have been lawfully created prior to January 1, 1985; and
  - The lot or parcel must have been acquired by the present owner prior to January 1, 1985. It may be inherited after, but may not have been purchased after January 1, 1985; and

For the purposes of this section, "owner" includes the wife, husband, son, daughter, mother, father, brother, brother-in-law, sister, sister-in-law, son-in-law, daughter-in-law, mother-in-law, father-in-law, aunt, uncle, niece, nephew, stepparent, stepchild, grandparent or grandchild of the owner or a business owned by any one or combination of these family members (215.705(6)).

- 3. The lot or parcel shall not have a dwelling on it; and
- 4. The dwelling cannot be prohibited by other requirements of the Comprehensive Plan or Zoning Ordinances and will comply fully with the Plan and Ordinances; and
- 5. The dwelling cannot be sited on a lot or parcel defined as high-value farmland unless a local Hearings Officer determines that:
  - a. The lot or parcel either alone or in conjunction with other parcels cannot be managed for farm use due to extraordinary circumstances inherent in the land or its physical setting that do not apply generally to other land in the vicinity of the lot or parcel; and
  - b. The dwelling meets the criteria set out in ORS and local codes for review of non-farm uses; and

- c. The dwelling will not materially alter the stability of the overall land use pattern in the area.
- 6. If the lot or parcel is located within a designated Big-Game Habitat Combining Zone, all density requirements must be met; and
- 7. The dwelling meets the siting criteria set out in Section 66.080; and
- 8. When the dwelling is sited on part of the tract, the remaining portions of the tract must be consolidated into a single lot or parcel as a condition of approval of the dwelling.
- 9. The following definition shall apply when reviewing a dwelling application under this Section:
  - a. Date of Creation and Existence. .When a lot, parcel or tract is reconfigured, pursuant to applicable law after November 4, 1993, the effect of which is to qualify a lot, parcel or tract for the siting of a dwelling, the date of the reconfiguration is the date of creation or existence. Reconfigured means any change in the boundary of the lot, parcel or tract.
- E. Accessory farm dwellings may be considered customarily provided in conjunction with farm use if each accessory farm dwelling meets the following criteria:
  - 1. The dwelling will be occupied by a person or persons who will be principally engaged in the farm use of the land and whose assistance in the management of the farm use is or will be required by the farm operator; and
    - a. The accessory dwelling will be located on the same lot or parcel as the primary farm dwelling of the principal farm dwelling; or
    - b. On the same tract as the principal primary farm dwelling when the lot or parcel on which the accessory farm dwelling will be sited is consolidated into a single parcel with all other contiguous lots and parcels in the tract; or
    - c. On a lot or parcel on which the principal primary farm dwelling is not located, when the accessory farm dwelling is a manufactured dwelling and a deed restriction is filed with the County Clerk. The deed restriction shall

require the manufactured dwelling to be removed when the lot or parcel is conveyed to another party. The manufactured dwelling may remain if it is re-approved under these rules; or

- d. On a lot or parcel on which the primary farm dwelling is not located, when the accessory farm dwelling is a multi-unit residential structure allowed by the applicable state building code or similar types of farm labor housing on the farm or ranch operation registered with the Department of Consumer and Business Services and Oregon Occupational Safety and Health Division. This farmworker housing shall be removed, demolished or converted to a nonresidential use when the farmworker housing is no longer required; or
- e. On a lot or parcel on which the primary farm dwelling is not located, when the accessory farm dwelling is located on a lot or parcel at least the size of the applicable minimum lot size and the lot or parcel complies with the gross farm income requirements in 64.070 (E)(7)
- 2. There is no other dwelling on the lands designated for exclusive farm use owned by the farm operator that is vacant or currently occupied by persons not working on the subject farm or ranch and that could reasonably be used as an accessory farm dwelling; and
- 3. The primary farm dwelling to which the proposed dwelling would be accessory must meet one of the following;
  - a. On land not identified as high value farmland, the principal farm dwelling is located on a farm or ranch operation that is currently employed for farm use, as defined in ORS 215.203, and produced in the last two years or three of the last five years the lower of the following;
    - (1) At least \$40,000 in gross annual income from the sale of farm products; or
    - (2) Gross annual income of at least the midpoint of the median income range of gross annual sales for farms in the County with the gross annual sales of \$10,000 or more according to the 1992 Census of Agriculture, Oregon; or

- b. On land identified as high value farmland, the principal farm dwelling is located on a farm or ranch operation that is currently employed for farm use, as defined in ORS 215.203, and produced at least \$80,000 in gross annual income from the sale of farm products in the last two years or three of the last five years.
- 4. The governing body of a county shall not approve any proposed division of a lot or parcel for an accessory farm dwelling approved pursuant to this section. If it is determined that an accessory farm dwelling satisfies the requirements of OAR 660-33-135, a parcel may be created consistent with the minimum parcel size requirements in OAR 660-33-100.

#### 66.080 - SITING STANDARDS

The placement of dwellings shall be on the least productive, buildable portion of the parcel taking into consideration terrain, adverse soil or land conditions, drainage and flooding, access, vegetation, location and the size of the tract. If the parcel is under forest assessment, the dwelling shall be sited upon generally unsuitable land for the production of merchantable tree species recognized under the Forest Practice Rules. The following will be required:

- A. Drawing requirements:
  - 1. A site map of the property which shows the township, range, section and tax lot numbers held in ownership by the property owner;
  - 2. All physical features on the site which are of significance with regard to review of the above application process including steep slopes, access roads, existing buildings and structures, and other improvements;
  - 3. The proposed location of new dwellings to be placed on the site.
- B. Siting requirements:
  - 1. The dwelling or activities associated with the dwelling will not force a significant change in or significantly increase the cost of accepted farming or forest practices on nearby lands devoted to farm or forest use; and
  - 2. The placement of dwellings shall be on the least productive, buildable portion of the parcel taking into consideration terrain, adverse soil or land conditions, drainage and flooding, access, vegetation, location and the size of the tract;

- a. A lot or parcel shall not be considered unsuitable solely because of size or location if it can reasonably be put to farm or forest use in conjunction with other land; and
- 3. If the parcel is under forest assessment, the dwelling shall be sited upon generally unsuitable land for the production of merchantable tree species recognized under the Forest Practice Rules considering the terrain, adverse soil or land conditions, drainage and flooding, vegetation, location and size of the parcel; and
- 4. The dwelling will not materially alter the stability of the overall land use pattern of the area; and
- 5. If the dwelling is established under Sections 66.070(B) or (C), then additional dwellings may not be approved or sited.

#### SECTION 66.090 - PARCEL STANDARDS

In addition to the requirements of Chapter 5, the following standards shall apply:

- A. The requirements for a division of land within the MUR Zone are:
  - 1. The minimum size of newly created parcel(s) for agricultural uses shall be 160 acres;
  - 2. A proposed land division shall meet all of the following criteria:
    - a. The parcels are for farm use as defined in ORS Chapter 215.203;
    - b. The division is appropriate for the continuation of the existing commercial agricultural operations within the area;
    - c. Parcels used or to be used for training or stabling facilities shall not be considered appropriate to maintain the existing commercial agricultural enterprise in an area where other types of agriculture occur;
    - d. The land division may not be approved for the purpose of siting a farm dwelling.

- B. A land division may be approved to create up to two new parcels smaller than the minimum size of the Multiple Use Range Zone, each to contain a dwelling not provided in conjunction with commercial farm use, if:
  - 1. The nonfarm dwellings meet the criteria for approval in Section 66.070(E).
  - 2. The parcels for the nonfarm dwellings are divided from a lot or parcel that was lawfully created prior to July 1, 2001; and
  - 3. The parcels for the nonfarm dwellings are divided from a lot or parcel that complies with the minimum parcel size for the MUR Zone; and
  - 4. The remainder of the original lot or parcel that does not contain the nonfarm dwellings will comply with the minimum parcel size for the MUR Zone; and
  - 5. The parcels for the nonfarm dwellings are generally unsuitable for the production of farm crops and livestock or merchantable tree species considering the terrain, adverse soil or land conditions, drainage or flooding, vegetation, located and size of tract. A parcel may not be considered unsuitable based solely on size or location if the parcel can reasonably be put to farm or forest use in conjunction with other land.
- C. A land division may to divide a lot or parcel into two parcels, each to contain one dwelling not provided in conjunction with farm use if:
  - 1. The nonfarm dwellings meet the criteria for approval in Section 66.070(E).
  - 2. The parcels for the nonfarm dwellings are divided from a lot or parcel that was lawfully created prior to July 1, 2001; and
  - 3. The parcels for the nonfarm dwellings are divided from a lot or parcel that is equal to or smaller than the minimum size for the Multiple Use Range Zone, but equal to or larger than 40 acres; and
  - 4. The parcels for the nonfarm dwellings are:
    - a. Not capable of producing more than 20 cubic feet per acre per year of wood fiber; and

- b. Either composed of at least 90 percent Class VII and VIII soils, or composed of at least 90 percent Class VI through VIII soils and are not capable of producing adequate herbaceous forage for grazing livestock.
- 5. The parcels for the nonfarm dwellings do not have established water rights for irrigation; and
- 6. The parcels for the nonfarm dwellings are generally unsuitable for the production of farm crops and livestock or merchantable tree species considering the terrain, adverse soil or land conditions, drainage or flooding, vegetation, location and size of tract. A parcel may not be considered unsuitable based solely on size or location if the parcel can reasonably be put to farm or forest use in conjunction with other land.
- 7. The following criteria shall be considered when approving a non-farm land division and in establishing the parcel size:
  - a. Preserve the maximum area of the agricultural base of Grant County for farm use;
  - b. Buffer adjoining farm uses from residential encroachment;
  - c. Utilize natural features and topography which would otherwise hinder normal farm activities;
  - d. Ensure that the proposed division will not materially alter the stability of the land use pattern of the area;
  - e. The parcel being created is situated on the portion of the parent parcel that is least suitable for farm uses;
  - f. If the proposed parcel is located within the Big Game Combining Zone, Article 69.2, all requirements of that Zone must be met;
  - g. The parcel must be disqualified from farm assessment and the back taxes have been paid.
- D. Historic Gravesites. A parcel which has received special assessment as farmland under ORS 308.370, may be partitioned as a historic gravesite if all of the following criteria are met:

- 1. The new parcel must be less than one acre in size;
- 2. The site must have been used as a cemetery at any time between 1810 to 1950;
- 3. The site must contain fewer than 50 marked graves;
- 4. The site must have been issued a patent before 1900;
- 5. The site is entitled to a way of necessity for non-motorized conveyance.
- E. The following are the parcel width requirements for all land divisions:
  - 1. The minimum parcel width for agricultural and forestry uses shall be 300 feet;
  - 2. The minimum parcel width for a non-farm dwelling shall be 200 feet;
  - 3. The minimum parcel width for all uses, other than agriculture, forestry and single family residences not in conjunction with farm use, shall be that width necessary for the proposed use;
  - 4. A lot or parcel having a width of less than 300 feet at the time of passage of this Code may be occupied by any use permitted in the MUR Zone, provided all other laws and Code requirements are met including Lot of Record requirements and setbacks.

#### **SECTION 66.095 - PROPERTY DEVELOPMENT STANDARDS**

The following standards will apply, as appropriate, to all development and land divisions within this Zone:

- A. Lot Size and Shape See Article 71
- B. Building & Accessory Heights, Setbacks, Yards See Article 72
- C. Stream Setbacks See Article 72
- D. Fences, Wall, and Screens See Article 73
- E. Signs See Article 74

- F. Parking See Article 75
- G. Access See Article 81
- H. Erosion and Sediment Control See Article 83
- I. Utilities See Article 85
- J. Solid Waste See Article 86
- K. Aggregate Mining and Processing See Article 91
- L. Home Occupations See Article 92
- M. Archeological Resources See Article 93
- N. Historic Resources See Article 94
- O. Hydroelectric Facilities See Article 95
- P. Destination Resort See Article 96
- Q. Parks, Playgrounds, and Campgrounds See Article 98
- R. Flood Hazard Combining Zone See Article 69.1
- S. Big Game Combining Zone See Article 69.2
- T. Wild & Scenic Rivers Combining Zone See Article 69.3
- U. Airport Combining Zone See Article 69.4
- V. Water Hazard Combining Zone See Article 69.5
- W. Mineral & Aggregate Combining Zone See Article 69.11

# Appendix F. Grant County Planning Department Type II Application

#### Grant County Planning Department 201 S. Humbolt Street, Suite 170 Canyon City, OR 97820

Phone: (541) 575-1519 Fax: (541) 575-2276

## Administrative Review – Type II Application

Applica	ation Number _		_
Applicant			
Name:			
Mailing Address:			
City/State/Zip:			
Phone:	Email:		
Property Owner			
Name:			
Mailing Address:			
City/State/Zip:			
Phone:	_ Email:		
Property Information			
Tax lot #	_ Township	South, Range	East,
Section(s)		_	
Size (acres)	Zoning		
Receiving farm deferral taxes	s. Yes	No	
Other Tax Lots listed on deed	l:		

#### Proposed land use requested (Refer to Chapter and Section of LDC allowing such use.

If application is for non-farm dwelling or partition, a supplemental form is required)
In the space provided below or on a separate sheet of paper, please provide a map of the subject property with all of the following information indicated on the map:

- 1. Arrow indicating direction of North;
- 2. Location of adjacent roads and proposed access;
- 3. Proposed and existing structures;
- 4. Location of existing or proposed sewage disposal system;
- 5. Distances from the property lines to all structures, existing and proposed;
- 6. Position of creeks, streams, ponds, springs or other drainage ways.

#### Other Materials and Information required for this application:

•	What is the parcel currently used for?
•	Documentation showing proof of ownership (Copy of recorded Deed – available from Grant County Clerk).

- Recorded documentation showing unrestricted access to a public road.
- This structure will be accessed off of \_\_\_\_\_(road name).
- Is a new access required to a County Road or State Highway? Yes\_\_\_\_ No \_\_\_\_ If yes, provide a copy of a Road Access Permit from Grant County Road Department or the State of Oregon Highway Department.

\_\_\_\_\_

- Solid waste (garbage) must be transported to an accepted disposal site or transfer station. Which one do you propose to use?
- Other materials necessary to complete this application (determined by the Pre-Application Conference):
- Please provide any additional information you feel may be helpful to your application:

By my signature below, I agree to abide by the requirements of the Grant County Land Development Code and the Grant County Comprehensive Plan as they apply to this request. I understand that the burden of proof rests upon the applicant, and that I am responsible for providing evidence that supports approval of my application. I also agree to furnish any supplemental materials or information determined by the Planning Department to be necessary or required to process my request.

Applicant's signature		date
I hereby authorize this reques	t by the applican	nt.
Property owner's signature		date
	FOR OFFICE	USE ONLY
Application received by		date
Type II fee ofreceiv	ed by	date
Cash: Credit	Card:	Check Number:
Date deemed complete:		
By:		
Dwelling on property? Y / N	Date of dwellin	g?
Farm Deferral? Y / N	Other Sp	pecial Assessment? Y / N
Tax Lot Card? Y / N		
Flood Zone?		
Wetlands Maps?		
Previous Applications/Land U	Jse Decisions:	

PF Only: Forester Statement required? Y / N Received? Y / N

### Applicant's Statement of Understanding

I, \_\_\_\_\_, have filed an application for a \_\_\_\_\_ with the Grant County Planning Department to be reviewed and processed according to State and County requirements. I acknowledge the following disclosures:

- I understand that any representations, conclusions or opinions expressed by staff during any pre-application reviews of this request do not constitute final authority or approval, and that I should not rely upon any such expressions in the place of a final approval in writing.
- I understand I may ask questions and receive input from Planning Staff, but acknowledge that I am ultimately responsible for all information and documentation submitted with this application. I further understand that Planning Staff can not legally bind the county to any fact or circumstance that conflicts with State or Local Laws, and in the event a conflict occurs, all such statements or agreements are void.
- I understand I have the burden of demonstrating my application meets all of the applicable criteria. The criteria for approving or denying my request have been are available to me at the Planning Department.
- I understand Planning Staff is entitled to ask for additional information or documentation any time after the submission of this application if it is determined such information is needed to review my application.
- I understand my application may be reviewed by the Oregon Department of Land Conservation and Development (DLCD). If this happens, and DLCD comments on the application, I understand DLCD has the authority to appeal the County's decision to the Oregon Land Use Board of Appeals if it chooses to do so.
- I understand it is the function of the Planning Staff to impartially review my application and to address all issues affecting it regardless of whether the issues promote or hinder the approval of my application. In the event a public hearing is required to consider my application, I agree it is my sole responsibility to present a favorable case for my application.
- I understand that I am entitled to have a lawyer or land use consultant help me with my application and to appear with me (or for me) at any appointment, conference, or hearing related to it.

Signature of Owner/Applicant or Representative\*

## Appendix G. Oregon Parks and Recreation Department Junction Property Requirements

#### Property/Taxlot Map:



The below excerpts from the Oregon Administrative Rules (OAR) apply to the Middle Fork John Day River State Scenic Waterway and specifically to the Scenic River Area covering the above taxlot. Some of the rules below do not currently apply to the proposed development, but were included in case they are needed as the proposal is refined. Some rules are included only to show where likely applicable rules occur in the OARs. These rules are included, but the text-has been crossed out.

Excerpts of OAR 736-040-0067

Middle Fork John Day River Scenic Waterway

(2) Scenic River Area:

(a) That segment of scenic waterway beginning at the confluence with Crawford Creek at about river mile 71, being in the Northwest 1/4 of Section 25, Township 11 South, Range 35 East, Willamette Meridian, (NW 1/4, Section 25, T 11S, R 35E, W.M.) and extending downstream approximately 60 miles to the intersection of the Middle Fork John Day River with the eastern section line of Section 11, Township 8 South, Range 29 East, Willamette Meridian, (Section 11, T 8S, R 29E, W.M.), at about river mile 11, is classified as a Scenic River Area.

(b) This Scenic River Area shall be administered consistent with the standards set by **OAR 736-040-0035** and **OAR 736-040-0040(1)(b)(B)**. In addition to these standards, all new development in resource zones (i.e. farm and forest related dwellings) shall comply with Grant County land use regulations.

(c) New structures and associated improvements shall be substantially screened by topography and/or native vegetation, except as provided under **OAR 736-040-0030(5)**, and except for those minimal facilities needed for public outdoor recreation or resource protection. If inadequate topographic or vegetative screening exists on a site, the structure or improvement may be permitted if native vegetation can be established to provide substantial screening of the proposed structure or improvement within a reasonable time (4–5 years). The condition of "substantial screening," as used in section (2) of this rule, shall consist of adequate topography and/or density and mixture of native, evergreen and deciduous vegetation to substantially obscure (at least 75%) the viewed structure or improvement.

(d) Commercial public service facilities, including resorts and motels, lodges and trailer parks which are visible from the river, shall not be permitted.

(e) New mining operations, except recreational placer mining and recreational prospecting, as those terms are defined and used in ORS 390.835, and similar improvements, shall be permitted only when they are totally screened from view from the river by topography and/or vegetation. If inadequate topographic or vegetative screening exists on a site, mining and similar forms of development may be permitted if native vegetation can be established to provide total screening of the affected area within a reasonable time (4–5 years). The condition of "total screening," as used in section (2) of this rule, shall consist of adequate topography and/or density and mixture of native, evergreen and deciduous vegetation to totally obscure (100%) the subject improvement.

(f) New roads may be permitted only when totally screened from view from the river by topography and/or vegetation. If inadequate topographic or vegetative screening exists to totally screen the proposed road, the road may be permitted if acceptable topography can be created or road design techniques used to totally screen the road at the time of construction or native vegetation can be established to provide total screening of the proposed road within a reasonable time (4–5 years).

(g) Where existing roads are visible from the river, extensions, realignments, upgrades, or other improvements, shall only be permitted when substantially screened from view from the river. If inadequate topography or vegetation exists to provide substantial screening, the road improvement may be permitted if acceptable topography can be created or road design techniques used to substantially screen the road at the time of construction or native vegetation can be established to provide substantial screening of the subject improvement within a reasonable time (4-5 years). When an

existing road is improved or regraded, no side cast into or visible from the river shall be permitted. Excess material shall be hauled to locations out of view from the river.

(h) Visible tree harvest or other vegetation management may be allowed provided that:

(A) The operation complies with the relevant Forest Practices Act rules;

(B) Harvest methods with low visual impact are used;

(C) The harvest or vegetation management does not degrade the riparian buffer of any waterway; and (D) The harvest or vegetation management is designed to enhance the scenic view within a reasonable time (5–10 years). For the purposes of this paragraph, "enhance" means to benefit forest ecosystem function and vegetative health by optimizing forest stand densities and vegetative composition, fostering forest landscape diversity and promoting sustainable forest values.

# (i) Improvements needed for public outdoor recreation use or resource protection may be visible from the river but shall be primitive in character and designed to blend with the natural character of the landscape.

(j) Proposed utility facilities shall share existing utility corridors, minimize any ground and vegetation disturbance, and employ non-visible alternatives when reasonably possible.

(k) Whenever the standards of **OAR 736-040-0035** and section (2), subsections (c) through (j) of this rule are more restrictive than the Grant County Land Use and Development Ordinance, the above Oregon Administrative Rule shall apply.

#### Excerpts of OAR 736-040-0030

Improvements and Changes in Use of Related Adjacent Lands

(1) Except as provided in section (5) of this rule, OAR 736-040-0035 and 736-040-0045 through 736-040-0075, no person shall make any improvement or change in the existing use of related adjacent land without first giving written notification to the Commission of the intent to make an improvement or change in land use. The proposed improvement or change in land use shall not be made or work started sooner than one year after such notice unless the Commission has given its written approval of the proposal. (See notification procedures in OAR 736-040-0080.)

(2) Upon receipt of such notice, the Commission shall determine if the proposal would impair the natural beauty of the scenic waterway substantially.

(3) If the proposed improvement or change of land use would not impair the natural beauty substantially, the Commission shall give written notice to the owner of the related adjacent land that he may proceed immediately with the proposal as described in his notification to the Commission.

(4) Should the Commission determine that the proposal, if carried out, would impair the natural beauty of the scenic waterway substantially, or otherwise violate the provisions of the Act or these rules and regulations, it will so notify the owner of the related adjacent land in writing. No steps shall be taken by the applicant to carry out such proposal until at least one year after the original notice to the Commission unless agreement with the Commission is sooner reached. (See OAR 736-040-0080.)

(5) In connection with existing use of related adjacent land, farmers, ranchers and residents may modify existing structures or construct or place such subsidiary and lesser structures adjacent thereto, except residences or guest houses, as are usual and necessary to their existing use without prior notice to the Commission, provided that such modification or construction will not violate OAR 736-040-0035(7)(a) and (b) and will be in harmony with the natural beauty of the scenic waterway.

(6) Repair and maintenance of existing facilities and structures in a manner compatible with these rules and regulations do not require notification to the Commission.

#### Excerpts of OAR 736-040-0035

#### Rules of Land Management

These rules and regulations governing the use of related adjacent lands and improvements made on or to these lands apply to all designated scenic waterways. Land management on scenic waterways includes, but is not limited to, the following examples:

(1) Timber Harvest: The forest cover on related adjacent land is a part of the scenic beauty of the scenic waterway and notification of planned timber harvest operations must be given to the Commission one year prior to commencement. The notification must include a plan specifying timber to be cut, road locations, logging methods, slash cleanup, soil stabilization, revegetation measures and any other details as the Commission may require.

(2) Tree Cutting: No person shall cut any living tree within a scenic waterway without prior written notice except as provided in these rules.

(3) Grazing and Farming: Existing use in the form of grazing or farming of the related adjacent land is a part of the scenic beauty of the waterway. Notification is not required for:

(a) Construction of fences;

(b) Maintenance of farm buildings, fences or appurtenances necessary to existing use;

(c) Laying of irrigation lines;

(d) Pump house construction, if not in violation of OAR 736-040-0030(5);

(e) Additions to farm buildings, if not in violation of OAR 736-040-0030(5);

(f) Crop rotation;

(g) Variations in grazing land management;

(h) Placing of grazing land under cultivation, except within classified natural river areas named in OAR 736 040 0045 through 736 040 0075;

(i) Construction of silos and grain storage facilities, and other structures or buildings as are needed in connection with the existing use of the related adjacent land, if not in violation of OAR 736-040-0030(5), except within classified natural river areas named in OAR 736-040-0045 through 736-040-0075; (j) Cutting of danger trees. Notification is required for construction of new roads or improvement of existing roads.

(4) Suburban Housing: Notification is not required for:

(a) Maintenance of existing homes in a manner compatible with these rules and regulations;

OARs that apply to Middle Fork John Day State Scenic Waterway – Scenic River Area Classification Subject Property: Section 30 T.8S. R.31E. W.M., Grant County

(b) Modifications to existing single family dwellings, if not in violation of OAR 736-040-0030(5); (c) Construction of garages necessary to the use of existing homes, if not in violation of OAR 736-040-0030(5);

(d) Changes in or additions to homesite landscaping which do not impair vegetation screening structures from view from the river;

(e) Construction of protective fences necessary to use of the home;

(f) Cutting of firewood for occupant's dwelling;

(g) Cutting of danger trees. Notification is required for construction of new roads or improvement of existing roads.

(5) Prospecting, Mining, Dredging, and Quarrying:

(a) All prospecting, mining, dredging, and quarrying operations, including removal or movement of gravel, rocks and sand within related adjacent lands, require notification to the Commission as prescribed herein;

(b) Such notification shall include plans to ensure that debris, silt, chemicals or other materials, will not be discharged into or allowed to reach the waters within a scenic waterway and that the natural beauty of the scenic waterway will not be impaired substantially.

(6) Transportation Facilities and Utilities:

(a) No roads, railroads or other facilities for transportation or utilities shall be constructed or improved within a scenic waterway without notification to the Commission as prescribed by the Act and herein;
(b) The Commission, whenever practicable, will require the sharing of land and airspace by such facilities and utilities. All permissible transportation facilities and utilities shall be so located as to minimize impairment of the natural beauty of the scenic waterway. For example, it will be desirable to place electrical and telephone lines underground wherever reasonably practicable.

(7) Structures, Buildings, and Other Improvements: Except as provided in OAR 736-040-0030(5), sections (3) and (4) of this rule and OAR 736-040-0045 through 736-040-0075, no structures, buildings, or other improvements shall be made, erected or placed on related adjacent lands without notification to the Commission as prescribed by the Act and herein. Permitted new structures, buildings, or other improvements on related adjacent lands which can be seen from the waters within a scenic waterway shall:

(a) Be of such design and be constructed of such materials as to be unobtrusive and compatible with the scenic qualities of the area. For example, the following shall apply:

(A) All structures shall be finished in muted tones appropriate to their natural surroundings;

(B) No large areas, including roofs, shall be finished with white or bright colors or reflective materials;

(C) No structures shall exceed 30 feet in height from natural grade on a side facing the river;

(D) All structures shall be so designed and constructed that little or no soil is left exposed when construction is completed.

(b) Be located in such a way that topography and natural vegetation make them as inconspicuous as reasonably practicable, and in no case obtruding on the view from the river. The Commission may require that additional vegetative screening be established and maintained. In such event, it shall be evergreen, wherever practicable, and compatible with natural growth in the area.

(8) Mobile homes, modular residential structures, house trailers, campers and similar structures and vehicles. Mobile homes, modular residential structures, house trailers, campers, motor homes and the

like shall not be established as dwellings, either permanent, (or) seasonal or temporary, within related adjacent lands unless they are entirely concealed from view from the waters within a scenic waterway by topography, except that those mobile homes, modular residential structures and house trailers, that are at least 20 feet wide, with exterior dimensions, less hitch, of 800 square feet, may be permitted under these rules subject to the same requirements and standards set forth in the previous section relating to criteria for review for structures and improvements that are visible from the waters within a scenic waterway. Additionally, except when a mobile home, modular residential structure, house trailer or the like is not set on a ground level foundation, full skirting shall be installed which in design, color and texture appears to be an integral part of the exterior of the structure:

(a) For the purposes of this division, a structure is a mobile home, modular residential structure, house trailer, camper or motor home if it is used, designed or intended to house persons, and is transported to the site in a state of substantial prefabrication. Once a structure fulfills this test, it shall remain subject to the rule regardless of whether the wheels or other temporary assembly have been removed or detached, and regardless of whether the structure is subsequently relocated;

(b) Within public recreation sites and transient public trailer parks where travel trailers, campers, motor homes and similar vehicles are permitted by the public agency, firm or individual maintaining the facility, their transient, short-term use by travelers is allowed, but they shall not be left on the site during their user's absence of more than three day's duration.

(9) Maintenance of Structures and Improvements: Owners and users of existing structures and other improvements shall maintain them and their surroundings in a manner and condition in harmony with the environment, compatible with the objectives set forth in these rules and regulations for the classified river area in which they lie, and without impairing substantially the natural beauty of the scenic waterway. The existing color of such structures may be maintained.

(10) Replacement of Existing Structures and Improvements: The Commission may approve replacement of existing structures and improvements, including those lost by fire, flood or other casualty, provided the new structure or improvement is in compliance with provisions of the Act and this division. Notification procedures set forth in OAR 736-040-0040 are required.

(11) Advertising: No signs or other forms of outdoor advertising that are visible from waters within a scenic waterway shall be constructed or maintained. Property protection signs (No Hunting, No Trespassing, etc.) are exempted.

(12) Erosion Protection: The Commission recognizes that erosion protection work and maintenance may be necessary on riverbanks and related adjacent lands along the scenic waterways. Notification, which shall include plans to protect the natural beauty of the scenic waterway, and Commission approval are required.

(13) Submerged and Submersible Lands:

(a) No dam or reservoir or other water impoundment facility shall be constructed or placer mining permitted on waters within scenic waterways. No water diversion facility shall be constructed or used except by right previously established or as permitted by the Oregon Water Resources Department, State Engineer, or Court decree;

(b) No bank protection works or dredging facility shall be constructed or used on such waters, except as permitted by the Director of the Department of State Lands and approved by the State Land Board.

#### (14) Emergencies:

(a) An owner or their authorized agent may act in emergencies without prior notice when necessary in the interest of public safety, or safety of an owner's property, except that notice of any action taken shall be filed with the Commission not later than seven days following the commencement of the emergency procedures;

(b) An owner or their authorized agent must show that the emergency situation required immediate action to prevent immediate danger or damage. Such emergency procedures shall not be extended beyond the minimum necessary to accomplish the needed protection safely and shall be conducted throughout in such manner as to minimize impairment of the natural beauty of the scenic waterway. For example, car bodies and similar scrap or trash shall not be used as riprap.

(15) Solid Waste, Pollution and Sanitation: Owners, occupants and users of related adjacent land shall comply with the rules and regulations of the Department of Environmental Quality relating to solid waste control, water, air and noise pollution control and sewage disposal.

#### Excerpts of OAR 736-040-0040

Classification of Scenic Waterways and Segments Thereof

(1) OAR 736-040-0040 through 736-040-0075 supplement, but in no way alter, other provisions of these rules and regulations. Notification procedures set forth in OAR 736-040-0030, 736-040-0035 and 736-040-0080, relating to Land Management, are applicable to these rules. In order to establish varying intensities of protection or development based on special attributes of each area within the scenic waterways, the following classifications are established:

(b) Scenic River Areas:

(A) Those designated scenic waterways or segments thereof with related adjacent lands and shorelines still largely primitive and largely undeveloped, except for agriculture and grazing, but accessible in places by roads. Scenic River Areas may not include long stretches of conspicuous or well-traveled roads paralleling the river in close proximity, but may include extensive areas in agricultural use;

(B) Scenic Areas will be administered to maintain or enhance their high scenic quality, recreational value, fishery and wildlife habitat, while preserving their largely undeveloped character and allowing continuing agricultural uses.

#### OAR 736-040-0045

Improvements and Changes in Use of Related Adjacent Lands

(1) Except as provided in section (5) of this rule, OAR 736-040-0035 and 736-040-0045 through 736-040-0075, no person shall make any improvement or change in the existing use of related adjacent land without first giving written notification to the Commission of the intent to make an improvement or change in land use. The proposed improvement or change in land use shall not be made or work started sooner than one year after such notice unless the Commission has given its written approval of the proposal. (See notification procedures in OAR 736-040-0080.)

(2) Upon receipt of such notice, the Commission shall determine if the proposal would impair the natural beauty of the scenic waterway substantially.

(3) If the proposed improvement or change of land use would not impair the natural beauty substantially, the Commission shall give written notice to the owner of the related adjacent land that he may proceed immediately with the proposal as described in his notification to the Commission.

(4) Should the Commission determine that the proposal, if carried out, would impair the natural beauty of the scenic waterway substantially, or otherwise violate the provisions of the Act or these rules and regulations, it will so notify the owner of the related adjacent land in writing. No steps shall be taken by the applicant to carry out such proposal until at least one year after the original notice to the Commission unless agreement with the Commission is sooner reached. (See OAR 736-040-0080.)

(5) In connection with existing use of related adjacent land, farmers, ranchers and residents may modify existing structures or construct or place such subsidiary and lesser structures adjacent thereto, except residences or guest houses, as are usual and necessary to their existing use without prior notice to the Commission, provided that such modification or construction will not violate OAR 736-040-0035(7)(a) and (b) and will be in harmony with the natural beauty of the scenic waterway.