



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Pied Piper
Sale AT-341-2019-W00588-01

District: Astoria

Date: January 15, 2019

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$1,183,656.42	\$645,332.88	\$1,828,989.30
		Project Work:	(\$565,378.00)
		Advertised Value:	\$1,263,611.30



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Timber Description

Location: Portions of Sections 7, 8, 16, 17 and 18, T4N, R7W, WM, Clatsop County, Oregon.

Stand Stocking: 90%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	19	0	98
Western Hemlock / Fir	17	0	98
Sitka Spruce	17	0	94
Red Cedar	19	0	98
Alder (Red)	16	0	96
Maple	17	0	96

Volume by Grade	2S	3S & 4S 6"-11"	3S 12"+	6" - 7"	8"+	8" - 9"	10" - 11"	12"+	Total
Douglas - Fir	1,847	562	122	0	0	0	0	0	2,531
Western Hemlock / Fir	341	186	0	0	0	0	0	0	527
Sitka Spruce	20	42	64	0	0	0	0	0	126
Red Cedar	0	0	0	7	66	0	0	0	73
Alder (Red)	0	0	0	465	0	369	611	521	1,966
Maple	0	0	0	53	0	7	13	13	86
Total	2,208	790	186	525	66	376	624	534	5,309

Comments: Pond Values Used: Local Pond Values, December 2018.

Expected Log Markets: Mist, Willamina, Banks, North Plains, Clatskanie, Tillamook, Garibaldi, Forest Grove, Warrenton, Elma, WA, Longview, WA, Vancouver, WA and Chehalis, WA.

Other hardwoods Stumpage Price = Pond Value minus Logging Cost:
 $\$136.40/\text{MBF} = \$490/\text{MBF} - \$353.60/\text{MBF}$

Other conifer Stumpage Price = Pond Value minus Logging Cost:
 $\$263.95/\text{MBF} = \$583.00/\text{MBF} - \$319.05/\text{MBF}$

Other Costs (with Profit & Risk to be added):

Traffic Control (flaggers) along County Road Area 1: $\$30/\text{hr} \times 2 \text{ flaggers} \times 40 \text{ hours} = \$2,400$
Additional Rigging Time for Area 2: $40 \text{ hrs} \times \$40/\text{hr} = \$1,600$
Additional Rigging Time for Area 3: $40 \text{ hrs} \times \$40/\text{hr} = \$1,600$
Additional Fire Hose: $1000' \times \$1/\text{ft} = \$1,000$

Machine Washing for Invasive Weed Compliance = \$2,000

Ditch Filters:
20 bales of straw @ $\$10.00/\text{bale} = \200
8 hours of labor @ $\$40/\text{hr} = \320

TOTAL Other Costs (with Profit & Risk to be added): \$9,120

Other Costs (No Profit & Risk added):
Easement Cost = \$653.00

ROAD MAINTENANCE
(See attached Road Maintenance Cost Summary Sheet)
TOTAL Road Maintenance: $\$26,440/5,309\text{MBF} = \$4.98/\text{MBF}$

SLASH PILING
(See attached Site Prep Cost Summary Sheet)
TOTAL Site Prep Cost: 11,157



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Logging Conditions

Combination#: 1

Douglas - Fir	86.00%
Western Hemlock / Fir	86.00%
Sitka Spruce	86.00%
Red Cedar	86.00%
Alder (Red)	86.00%
Maple	86.00%

Logging System: Cable: Large Tower >=70
yarding distance: Medium (800 ft)
tree size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF
loads / day: 9
cost / mbf: \$175.71
machines: Log Loader (A)
Tower Yarder (Large)

Process: Manual Falling/Delimbing
downhill yarding: No
bd. ft / load: 4300

Combination#: 2

Douglas - Fir	14.00%
Western Hemlock / Fir	14.00%
Sitka Spruce	14.00%
Red Cedar	14.00%
Alder (Red)	14.00%
Maple	14.00%

Logging System: Shovel
yarding distance: Medium (800 ft)
tree size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF
loads / day: 10
cost / mbf: \$93.75
machines: Shovel Logger

Process: Manual Falling/Delimbing
downhill yarding: No
bd. ft / load: 4200



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Logging Costs

Operating Seasons: 3.00

Profit Risk: 11%

Project Costs: \$565,378.00

Other Costs (P/R): \$9,120.00

Slash Disposal: \$11,157.00

Other Costs: \$653.00

Miles of Road

Road Maintenance: \$4.98

Dirt	Rock (Contractor)	Rock (State)	Paved
0.0	0.0	0.0	0.0

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	4.4
Western Hemlock / Fir	\$0.00	2.0	3.6
Sitka Spruce	\$0.00	2.0	4.5
Red Cedar	\$0.00	2.0	4.0
Alder (Red)	\$0.00	2.0	2.5
Maple	\$0.00	2.0	3.5



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Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Brand & Paint	Other	Total
Douglas - Fir									
\$164.24	\$5.08	\$2.48	\$110.11	\$1.72	\$31.20	\$2.10	\$2.00	\$0.12	\$319.05
Western Hemlock / Fir									
\$164.24	\$5.08	\$2.48	\$134.58	\$1.72	\$33.89	\$2.10	\$2.00	\$0.12	\$346.21
Sitka Spruce									
\$164.24	\$5.28	\$2.48	\$111.89	\$1.72	\$31.42	\$2.10	\$2.00	\$0.12	\$321.25
Red Cedar									
\$164.24	\$5.08	\$2.48	\$121.12	\$1.72	\$32.41	\$2.10	\$2.00	\$0.12	\$331.27
Alder (Red)									
\$164.24	\$5.18	\$2.48	\$197.60	\$1.72	\$40.83	\$2.10	\$2.00	\$0.12	\$416.27
Maple									
\$164.24	\$5.18	\$2.48	\$141.14	\$1.72	\$34.62	\$2.10	\$2.00	\$0.12	\$353.60

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$712.32	\$393.27	\$0.00
Western Hemlock / Fir	\$0.00	\$583.00	\$236.79	\$0.00
Sitka Spruce	\$0.00	\$412.33	\$91.08	\$0.00
Red Cedar	\$0.00	\$1,043.95	\$712.68	\$0.00
Alder (Red)	\$0.00	\$738.55	\$322.28	\$0.00
Maple	\$0.00	\$490.00	\$136.40	\$0.00



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Summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Western Hemlock / Fir	0	\$0.00	\$0.00
Sitka Spruce	0	\$0.00	\$0.00
Red Cedar	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00
Maple	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	2,531	\$393.27	\$995,366.37
Western Hemlock / Fir	527	\$236.79	\$124,788.33
Sitka Spruce	126	\$91.08	\$11,476.08
Red Cedar	73	\$712.68	\$52,025.64
Alder (Red)	1,966	\$322.28	\$633,602.48
Maple	86	\$136.40	\$11,730.40

Gross Timber Sale Value

Recovery: \$1,828,989.30

Prepared By: Cody Valencia

Phone: 503-325-5451

Site Prep Appraisal

Sale Number: 341-18-50

Sale Name: Pied Piper

Date: 02/27/2018

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre
Doug-fir	A	1.0	3.0
Hemlock/Fir	B	1.5	4.0
Hemlock/Spruce	C	2.0	6.0
Hemlock	D	2.0	6.0
Conifer/Hardwood	E	1.5	3.0

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	A	7	7	\$129.00	\$903.00
2	MC	E	10	15	\$129.00	\$1,935.00
3	MC	E	6	9	\$129.00	\$1,161.00
Sub Total =						\$3,999.00
Sale Area	Number of Landings to be Piled	Cost/Landing Pile*	Total Cost/Area	Number of In- Unit Piles	Material Cost/Pile	Total Cost/Area
1	5	\$263.00	\$1,315.00	21	\$5.00	\$105.00
2	8	\$263.00	\$2,104.00	30	\$5.00	\$150.00
3	8	\$263.00	\$2,104.00	18	\$5.00	\$90.00
*Cost includes separating firewood						\$5,868.00
Move-In Allowance	Number of Move-In's	Total Move-In Allowance	Sub Total =			\$1,290.00
\$1,290.00	1	\$1,290.00				
Grand Total =						\$11,157.00

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Pied Piper
Date: November 21, 2018
By: John Choate *FL*

MBF: 5,309
\$/MBF: \$4.98

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost
Interim Operations	Grader 14G	\$875	1	18	\$113	\$2,909
	Dump Truck 12CY	\$184	1	8	\$89	\$896
	FE Loader C966	\$875	1	4	\$94	\$1,251
Snow	Grader 14G	\$875	1	12	\$113	\$2,231
Final Road Maintenance	Grader 14G	\$875	1	59	\$113	\$7,542
	Dump Truck 12CY	\$184	1	15	\$89	\$1,519
	FE Loader C966	\$875	1	10	\$94	\$1,815
	Vibratory Roller	\$875	1	59	\$87	\$6,008
	Water Truck 2,500 gallon	\$214	1	15	\$101	\$1,729
	Labor			12	\$45	\$540
Total						\$26,440

Interim Operations Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	3.0	6.60	2.2	18

Final Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	1.5	11	7.3	59
Vibratory Roller	1.5	11	7.3	59

Process and compact: All crushed rock roads

Lost Lake Road - 1.4 Miles

August Fire Road - 0.2 Miles

Quartz Creek Road - 3 Miles

Unnamed Rocked spurs - 2.5 Miles

New Construction Spurs - 1.7 Miles

Grade & Process Total = 11

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Pied Piper

Project No. 1: ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
1A-1B, 2A-2B, 2C-2D, 2E-2F, 2G-2H, 3A-3B, 3C-3D, 3E-3F	90.15	\$82,367
Road Maint.		\$589.72
Move-In		\$3,485.70
TOTALS	90.15	\$86,442

Project No. 2: ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
11-12, 13-14, 15-16, 17-18	353.35	\$104,026
Road Maint.		\$744.78
Move-In		\$4,402.30
TOTALS		\$109,173

SPECIAL PROJECTS (Move-In and Road Maint. are included separately as needed, for each Special Project):

<u>Description</u>	<u>Cost</u>
Project No. 3 Roadside Brushing	\$64,109.00
Project No. 4 Lost Lake Quarry Development, Rock Crushing and Shockpiling	\$271,476.00
Project No. 5 Road Stabilization	\$34,178.00
TOTAL	\$369,763

GRAND TOTAL **\$565,378**

Compiled By: ELLA SALKELD FL Date: _____

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Pied Piper

NEW CONSTRUCTION: 90.15 STATIONS

1.71 MILES

ROAD: 1A-1B(5.00), 2A-2B(4.00), 2C-2D(30.35), 2E-2F(1.00),

POINTS: 2G-2H(1.50), 3A-3B(16.25), 3C-3D(24.90), 3E-3F(7.15)

CLEARING & GRUBBING

	Method	Acres/amount	x	Rate	=	Cost
1A-1B	Scatter outside of R/W, \$/ac	4.00	x	\$ 1,337	=	\$5,348.00
2A-2B	Scatter outside of R/W, \$/ac	3.00	x	\$ 1,337	=	\$4,011.00
2C-2D	Existing road grade, Scatter outside R/W v	10.00	x	\$ 155	=	\$1,550.00
2E-2F	Existing road grade, Scatter outside R/W v	1.00	x	\$ 155	=	\$155.00
2G-2H	Scatter outside of R/W, \$/ac	1.00	x	\$ 1,337	=	\$1,337.00
3A-3B	Existing road grade, Scatter outside R/W v	5.00	x	\$ 155	=	\$775.00
3C-3D						
0+00-8+30	Existing road grade, Scatter outside R/W v	4.00	x	\$ 155	=	\$620.00
8+30-24+90	Scatter outside of R/W, \$/ac	1.50	x	\$ 1,337	=	\$2,005.50
3E-3F	Existing road grade, Scatter outside R/W v	4.00	x	\$ 155	=	\$620.00
					=	\$0.00
SUB TOTAL FOR CLEARING & GRUBBING						\$16,422

EXCAVATION

	Material	Cy/amount	x	Rate	=	Cost
1A-1B	Balanced construction, \$/sta.	3.0	x	\$122.00	=	\$366.00
	Drift earth, \$/sta.	2.0	x	\$190.00	=	\$380.00
1+50	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
1B	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2A-2B	Balanced construction, \$/sta.	4.0	x	\$122.00	=	\$488.00
	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2C-2D	Existing road grade, 0+00 - 30+35					
24+95	Reconstruct fill w/330, \$/hr	4.0	x	\$155.00	=	\$620.00
	End-haul backfill from borrow site w/10-12t	2.0	x	\$79.00	=	\$158.00
	Fill compaction w/vib. roller, \$/hr	1.0	x	\$77.00	=	\$77.00
30+35	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2E-2F	Balanced construction, \$/sta.	1.0	x	\$122.00	=	\$122.00
	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2G-2H	Balanced construction, \$/sta.	1.5	x	\$122.00	=	\$183.00
	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
3A-3B	Existing road grade, 0+00 - 16+25					
2+25-3+10	Sidecast pullback & hauled to waste area,	0.85	x	\$557.00	=	\$473.45
1+00-3+75	Existing road realignment, end-haul excav	380	x	\$1.72	=	\$653.60
3C-3D	Existing road grade, 0+00 - 8+30					
8+30-24+90	Balanced construction, \$/sta.	16.6	x	\$122.00	=	\$2,025.20
14+80, 24+90	Landing construction, \$/ldg	2.0	x	\$389.00	=	\$778.00
3E-3F	Existing road grade, 0+00 - 7+15					
	Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
SUB TOTAL FOR EXCAVATION						\$9,047

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
2A-2B					24+95	24"CPP	60	\$27.04	\$1,622.40
0+00	18"CPP	30	\$19.53	\$585.90	29+35	18"CPP	30	\$19.53	\$585.90
2C-2D					3C-3D				
1+80	18"CPP	40	\$19.53	\$781.20	0+00	18"CPP	30	\$19.53	\$585.90
3+95	18"CPP	30	\$19.53	\$585.90					
6+15	18"CPP	30	\$19.53	\$585.90					
10+10	18"CPP	40	\$19.53	\$781.20					
16+55	18"CPP	40	\$19.53	\$781.20					
19+35	18"CPP	40	\$19.53	\$781.20					
23+80	18"CPP	30	\$19.53	\$585.90					

	Description	Quantity	Rate	Cost
Other/miscellaneous:				
Culvert stakes & markers:	6' x 2 1/2" white fiberglass posts	11	\$20.00	\$220.00
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION				\$8,483

Subtotal of Clearing, Exc., Culv.

\$33,951

SURFACING				Stations/ amount		x		Rate/ sta/amt		Cost	
Subgrade prep: Description				Grade, Shape and Ditch 16'		90.15		x		\$24.83 \$2,238.42	
				Subgrade Compaction		90.15		x		\$20.19 \$1,820.13	
ROAD SEGMENT 1A to 1B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 5+00					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-5+00	8	station	50	stations	5.00	250	\$4.83	\$1,208	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Subgrade Reinforcement	6"-0" pit-run	3+00-5+00	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit-run	1+50, 5+00	N/A	Landing	88	Landings	2	176	\$5.03	\$885	
Total Rock for Road Segment:				1A to 1B				598			\$2,954
ROAD SEGMENT 2A to 2B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A to 2B		0+00 to 4+00					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-4+00	8	station	50	stations	4.00	200	\$4.83	\$966	
Turnouts	4"-0" crushed	1+20	8	TO	22	TO's	1	22	\$4.83	\$106	
Turnarounds	4"-0" crushed	2+50	8	TA	22	TA's	1	22	\$4.83	\$106	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Subgrade Reinforcement	6"-0" pit-run	2+00-4+00	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit-run	4+00	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				2A to 2B				504			\$2,482
ROAD SEGMENT 2C to 2D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	2C to 2D		0+00 to 30+35					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-30+35	8	station	50	stations	30.35	1,519	\$4.83	\$7,337	
Turnouts	4"-0" crushed	3+15,7+30,13	8	TO	22	TO's	5	110	\$4.83	\$531	
Turnarounds	4"-0" crushed	27+05	8	TA	11	TA's	1	11	\$4.83	\$53	
Junction Rock	4"-0" crushed	0+00	8	Junctions	11	Junctions	1	11	\$4.83	\$53	
Curve Widening	4"-0" crushed		8	curve	11	curves	3	33	\$4.83	\$159	
Culvert Bedding/Backfill	3/4"-0" crushed	24+95	N/A	load	11	loads	6	66	\$4.83	\$319	
Traction Rock	3/4"-0" crushed	13+80-30+35	2	station	13	stations	16.55	215	\$4.83	\$1,039	
Subgrade Reinforcement	6"-0" pit-run	28+35-30+35	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit-run	30+35	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				2C to 2D				2,203			\$10,689
ROAD SEGMENT 2E to 2F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	2E to 2F		0+00 to 1+00					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	1+00	8	station	50	stations	1.00	50	\$4.83	\$242	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Landings	6"-0" pit-run	1+00	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				2E to 2F				160			\$790
ROAD SEGMENT 2G to 2H				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	2G to 2H		0+00 to 1+50					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-1+50	8	station	50	stations	1.50	75	\$4.83	\$362	
Turnarounds	4"-0" crushed	0+00	8	TA	22	TA's	1	22	\$4.83	\$106	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Landings	6"-0" pit-run	1+50	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				2G to 2H				207			\$1,017
ROAD SEGMENT 3A to 3B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B		0+00 to 16+25					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-16+25	8	station	50	stations	16.25	813	\$4.83	\$3,924	
Turnouts	4"-0" crushed	3+65,8+95	8	TO	22	TO's	2	44	\$4.83	\$213	
Turnarounds	4"-0" crushed	10+40	8	TA	22	TA's	1	22	\$4.83	\$106	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Subgrade Reinforcement	6"-0" pit-run	14+25-16+25	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit-run	16+25	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				3A to 3B				1,139			\$5,547
ROAD SEGMENT 3C to 3D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	3C to 3D		0+00 to 24+90					
				Volume (CY) per	Number of						
Base Rock	4"-0" crushed	0+00-24+90	8	station	50	stations	24.90	1,245	\$4.83	\$6,013	
Turnouts	4"-0" crushed	4+30,8+30,12+80,18+40	8	TO	22	TO's	4	88	\$4.83	\$425	
Turnarounds	4"-0" crushed	12+80,23+90	8	TA	22	TA's	2	44	\$4.83	\$213	
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106	
Traction Rock	3/4"-0" crushed	8+30-10+65,14+80-24+90	2	station	13	stations	12.45	162	\$4.83	\$782	
Turnouts	3/4"-0" crushed	8+30,18+40	2	TO	11	TO's	2	22	\$4.83	\$106	
Subgrade Reinforcement	6"-0" pit-run	13+80-15+80,22+90-24+90	12	station	75	stations	4	300	\$5.03	\$1,509	
Landings	6"-0" pit-run	18+40,24+90	N/A	Landing	88	Landings	2	176	\$5.03	\$885	
Total Rock for Road Segment:				3C to 3D				2,059			\$10,039

Compiled By: Kraig Kirkpatrick Date: 02/23/2018

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Pied Piper

ROAD: 11-12(250.55), 13-14(70.55), 15-16(16.75), 17-18(15.50)

IMPROVEMENT: 353.35 STATIONS

6.69 MILES

POINTS:

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
15-16 Marked trees on cutbanks & Landing constr	0.3	x	\$1,337.00	=	\$401.10

SUB TOTAL FOR CLEARING & GRUBBING

\$401

EXCAVATION

Material	Cy/amount	x	Rate	=	Cost
11-12					
0+00-61+90 Load & haul ditch waste material, \$/sta.	61.9	x	\$22.92	=	\$1,418.75
66+30-117+95 Scatter ditch waste material, \$/sta.	51.7	x	\$12.41	=	\$640.98
126+90-128+61 Load & haul bank slough material w/315 & 1	1	x	\$180.00	=	\$180.00
139+40 Load & haul bank slough material w/315 & 1	1	x	\$180.00	=	\$180.00
13-14					
23+35, 57+35 Clean culvert inlets w/315, \$/hr	0.5	x	\$101.00	=	\$50.50
24+85 Load & haul bank slough material w/315 & 1	0.5	x	\$180.00	=	\$90.00
15-16 Landing Construction, \$/ldg	1	x	\$389.00	=	\$389.00

SUB TOTAL FOR EXCAVATION

\$2,949

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
11-12									
59+75	18"CPP	40	\$19.53	\$781.20					
91+00	18"CPP	40	\$19.53	\$781.20					
189+80	18"CPP	40	\$19.53	\$781.20					
238+70	18"CPP	50	\$19.53	\$976.50					

Other/miscellaneous:	Description	Quantity	Rate	Cost
Culvert stakes & markers:	6"X2 1/2" white fiberglass post	4	\$20.00	\$80.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION

\$3,400

Subtotal of Clearing, Exc., Culv.

\$6,750

SURFACING								Stations/ amount	x	Rate/ sta/amt	Cost				
Subgrade prep: Description								353.35	x	\$24.83	\$8,773.68				
								Grade, Shape and Ditch 16'							
								353.35	x	\$20.19	\$7,134.14				
ROAD SEGMENT I1 to I2															
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost					
				I1 to I2		0+00 to 250+55									
				Volume (CY) per		Number of									
Surface Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	20	220	\$4.83	\$1,063					
Surfacing	3/4"-0" crushed	0+00-250+55	6	station	38	stations	250.55	9,521	\$4.83	\$45,986					
		5+90,10+25,14+25, 18+90,22+45,24+85 ,28+45,30+10,32+5 5,34+90,39+30,41+ 95,43+80,48+50,51 +60,54+25,56+00,5 8+00,66+30,74+20, 76+40,82+85,89+55 ,94+35,104+90,112 +10,122+25,124+90 ,126+90,131+50,13 4+30,146+20,153+9 5,157+40,161+70,1 66+20,169+85,172+ 35,173+75,177+80, 183+55,190+75,198 +25,204+70,209+10 ,211+85,218+00,22 0+75,227+80,234+7 5,245+00	6												
Turnouts	3/4"-0" crushed			turnout	22	turnouts	51	1,122	\$4.83	\$5,419					
		61+90,63+50,90+70 ,91+00,117+95,168 +20,174+90,175+80 ,186+50,200+25,23 8+70,240+85,250+0 0	6	junction	22	junctions	13	286	\$4.83	\$1,381					
Junctions	3/4"-0" crushed														
Curve Widening Surface	3/4"-0" crushed		6	load	11	loads	22	242	\$4.83	\$1,169					
		59+75,91+00,189+8													
Culvert Bedding and Backfill	3/4"-0" crushed	0,238+70	N/A	culvert	44	culverts	4	176	\$4.83	\$850					
Culvert Energy Dissipator	24"-6" riprap	117+35	N/A	dissipator	11	dissipators	1	11	\$1.26	\$14					
Total Rock for Road Segment:								11,578			\$55,882				
ROAD SEGMENT I3 to I4															
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost					
				I3 to I4		0+00 to 70+55									
				Volume (CY) per		Number of									
Surface Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	15	165	\$4.83	\$797					
Surfacing	3/4"-0" crushed	0+00-14+05	6	station	38	stations	14.05	534	\$4.83	\$2,579					
Total Rock for Road Segment:								699			\$3,376				
ROAD SEGMENT I5 to I6															
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost					
				I5 to I6		0+00 to 16+75									
				Volume (CY) per		Number of									
Subgrade Leveling Rock	4"-0" crushed		N/A	load	11	loads	5	55	\$4.83	\$266					
Surfacing	4"-0" crushed	0+00-16+75	4	station	25	stations	16.75	419	\$4.83	\$2,023					
Turnouts	4"-0" crushed	9+00	4	turnout	22	turnout	1	22	\$4.83	\$106					
Turnaround	4"-0" crushed	14+70	4	turnaround	11	turnaround	1	11	\$4.83	\$53					
Junctions	4"-0" crushed	0+00	4	junction	11	junctions	1	11	\$4.83	\$53					
Traction Rock	3/4"-0" crushed	0+85-9+00	2	station	13	stations	8.2	106	\$4.83	\$512					
Subgrade Reinforcement	6"-0" pit-run	14+75-16+75	12	station	75	stations	2	150	\$5.03	\$755					
Landings	6"-0" pit run	15+25, 16+75	N/A	Landing	88	Landings	2	176	\$5.03	\$885					
Total Rock for Road Segment:								950			\$4,652				
ROAD SEGMENT I7 to I8															
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost					
				I7 to I8		0+00 to 15+50									
				Volume (CY) per		Number of									
Subgrade Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	10	110	\$4.83	\$531					
Subgrade Leveling Rock	4"-0" crushed		N/A	load	11	loads	5	55	\$4.83	\$266					
Subgrade Reinforcement	6"-0" pit-run	13+50-15+50	12	station	75	stations	2	150	\$5.03	\$755					
Landings	6"-0" pit run	15+50	N/A	Landing	88	Landings	1	88	\$5.03	\$443					
Total Rock for Road Segment:								403			\$1,994				

Processing:	Description	No. sta	Rate/sta	Cost	
	Spread & Compact Subgrade Reinforcement Rock w/dozer (6"-0"pr)	4	31.54	\$126	
	Water, Process & Compact:	263.35	\$56.48	\$14,874	
	Traction Rock Water, Process & Compact	8.20	\$56.48	\$463	
I1-I2, 0+00 to 90+00 w/Proj. No5					
SUB TOTAL FOR SURFACING	24"-6" rr	6"-0"pr	4"-0" crushed	3/4"-0" crushed	Total
	11	564	573	12,482	13,630
				13,630	\$97,275
SPECIAL PROJECTS					
	Description	Cyl/Amount	Rate	Cost	
	pit-run development	564	See Proj. 4		
	riprap development	11	See Proj. 4		
SUB TOTAL FOR SPECIAL PROJECTS					\$0
Subtotal of Surfacing & Spec. Proj.					\$97,275
Subtotal of Clearing, Exc., Culv.					\$6,750
GRAND TOTAL					\$104,026

SUMMARY OF ROCK DEVELOPMENT AND CRUSHING COSTS

PROJECT NO. 4	Timber Sale Name: Pied Piper
Quarry: Lost Lake Quarry	Swell:
Location: SW 1/4, SW 1/4, Sec.17, T4N, R7W	Shrink: 16%
County: Clatsop	
By: W. Lawrence / K. Kirkpatrick	Loading Hopper: Yes
Date: 02/23/2018	

ROCK SIZE	REJECT	GRADATION	STOCKPILE CU. YDS.	TRUCK MEAS CU. YDS.	TOTAL CU. YDS.
3/4"-0"	2%	CR		12,947	12,947
1-1/2"-0"	2%	CR	5,000		5,800
4"-0"	2%	CR	5,000	5,709	11,509
6"-0"		PR		2,494	2,494
24"-6"		RR		11	11
36"		RR			
TOTAL CUBIC YARDS OF ROCK:			10,000	21,161	32,761

1) MOBILIZATION & SET UP:

EQUIPMENT	QUANTITY	RATE	COST	EQUIPMENT	QUANTITY	RATE	COST
Dump Trucks	2	\$184	\$368	Off Highway Dump Truck	1	\$622	\$622
D6 Cat	1	\$875	\$875	Screening Plant	1	\$622	\$622
Drill & Compressor	2	\$1,581	\$3,162	Loading Hopper	1	\$622	\$622
Powder	2	\$395	\$790	Loader	1	\$905	\$905
Excavator	2	\$1,581	\$3,162	Fire Truck	1	\$214	\$214
				3 Stage Crusher	1	\$3,250	\$3,250

SUB TOTAL FOR MOBILIZATION

\$14,592

EQUIPMENT SET UP	TIMES	RATE	COST
3 Stage Crusher	1	\$3,866	\$3,866
Screening Plants	2	\$330	\$660
Loading Hopper	1	\$330	\$330
Original Calibration	1	\$612	\$612

SUB TOTAL FOR SET UP COSTS

\$5,468

TOTAL MOBILIZATION & SET UP COSTS

\$20,060

2) CLEARING & GRUBBING

DESCRIPTION	QUANTITY	UNIT	RATE	COST
Pile & Burn Slash and Stumps(\$/Ac.)	1.5	Acers	\$2,702	\$4,053

TOTAL CLEARING & GRUBBING COSTS

\$4,053

3) EXCAVATION

MATERIAL DESCRIPTION	QUANTITY	UNIT	RATE	COST
Overburden Removal (excavate, load haul, spread)(C330,D6,D.Truck 2X)	8	Hours	\$426.00	\$3,408
Quarry access road improvement (C330)	4	Hours	\$155.00	\$620

TOTAL EXCAVATION COSTS \$4,028

4) DEVELOP ROCK

ROCK SUMMARY			METHOD	%	QUANTITY	RATE	COST
Type	Cu. yd. Vol.	Weight	Ripping			\$2.20	
crushed	30,256	92%	Drill & shoot	100%	33,366	\$2.30	\$76,742
pit run	2,494	8%	Oversize red	5%	1,638	\$5.80	\$9,498
rip rap	11	0%	Other				
Total	32,761						
reject	605	1.8%					

TOTAL ROCK DEVELOPMENT COSTS \$86,240

5) CALIBRATION & TESTING

DESCRIPTION	NO.	\$/TEST	COST
Calibrate	3	\$507.00	\$1,521
Calibrate			
Test	15	\$57.30	\$867
Test			

TOTAL CALIBRATION & TESTING COSTS \$2,388

6) FEEDING & LOADING

DESCRIPTION	CU. YD. QUANTITY	COST CU. YD.	TOTAL COST
Dig & Feed Rock	30,861	\$0.88	\$27,276

TOTAL FEEDING & LOADING COSTS \$27,276

7) ROCK CRUSHING

ROCK SIZE	ROCK TYPE	CU. YD. QUANTITY	CRUSHER TYPE	HOURLY PRODUCTION	RATE CU. YD.	TOTAL COST
3/4"-0"	crushed	12,947	3 stage w/s	110	\$3.54	\$45,785
1-1/2"-0"	crushed	5,800	3 stage w/s	120	\$3.24	\$18,802
4"-0"	crushed	11,509	2 stage w/s	140	\$2.48	\$28,526

TOTAL ROCK CRUSHING COSTS \$93,113

8) STOCKPILING

STOCKPILE SITE PREPARATION

Equipment	Hours	Rate	Total
Dozer	4	\$120.00	\$480.00
Compactor		\$72.00	
Grader		\$90.00	
Excavator		\$138.00	

Rock for Floor (CY)	\$/CY Haul	Total

\$480.00

SUB TOTAL \$480

HAUL & STOCKPILE		# of				
STOCKPILE LOCATION	SIZE	TRUCKS	CU. YDS.	RATE	COST	

1.						
2.	Lost Quarry Stockpile Site	1-1/2"-0"	2	5,800	\$2.55	\$14,776
3.	Lost Quarry Stockpile Site	4"-0"	2	5,800	\$2.55	\$14,776
4.						
5.						
6.						

SUB TOTAL \$29,552

TOTAL STOCKPILING COSTS \$30,032

9) MISCELLANEOUS COSTS

DESCRIPTION	COST
Load, Haul, and Spread the reject material at the waste area.	\$2,287
\$3.78 /CY 605 CY	
Final Quarry Dev., Access Road Const., Waterbarring, Drainage, Block Quarry Access	\$2,000

TOTAL MISCELLANEOUS COSTS \$4,287

10) GRAND TOTAL: \$271,476

\$/Cubic Yard \$8.97

Footnotes:

HAUL and STOCKPILE COST

SALE NAME: Pied Piper
 QUARRY: Lost Lake Quarry

ROCK TYPE: Crushed

Location 1. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
							0.10
Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>#DIV/0!</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>#N/A</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u> Truck type: _____ No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u>							
Location 1. 0		Haul and Stockpile Cost			#DIV/0! /cy		

Location 2. Lost Quarry 1-1/2"-0"	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				0.10	0.30	0.05	
Truck type: <u>D20</u> No. trucks: <u>2</u> Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>\$1.65</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>\$0.90</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>969</u> Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>969</u>							
Location 2. Lost Quarry Stockpile Site		Haul and Stockpile Cost			\$2.55 /cy		

Location 3. Lost Quarry Stockpile 4"-0"	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				0.10	0.30	0.05	
Truck type: <u>D20</u> No. trucks: <u>2</u> Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>\$1.65</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>\$0.90</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>969</u> Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>969</u>							
Location 3. Lost Quarry Stockpile Site		Haul and Stockpile Cost			\$2.55 /cy		

HAUL and STOCKPILE COST

Location 4. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				1.00	1.00		
Truck type: <u>D20</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>#DIV/0!</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>#N/A</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u> Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u>							
Location 4.		0		Haul & Stockpile Cost		#DIV/0! /cy	

Location 5. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
							0.10
Truck type: <u>D20</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>#DIV/0!</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>#N/A</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u> Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u>							
Location 5.		0		Haul & Stockpile Cost		#DIV/0! /cy	

Location 6. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				1.00	1.00		
Truck type: <u>D20</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: <u>#DIV/0!</u> /cy Load: <u>\$0.00</u> /cy Stockpile: <u>#N/A</u> /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u> Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u> Production: cy/day = <u>0</u>							
Location 6.		0		Haul & Stockpile Cost		#DIV/0! /cy	

CRUSHED ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 1 and No.2
Stockpile:	Lost Lake

DATE: 03/19/2018
BY: Ella Salkeld

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>2</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$3.56	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>5</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

Truck type: D10 No. trucks:
 Delay min.: 5 Efficiency: 85%

Production: cy/day = 1,335

CRUSHED ROCK HAUL COSTS 18,656 cy @ \$4.83 /cy

PIT RUN ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 1 and No. 2
QUARRY:	Lost Lake

MATERIAL: Pit Run

DATE: 03/19/2018
BY: Ella Salkeld

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>2</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$3.77	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>5</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

Truck type: D10 No. trucks:
 Delay min.: 5 Efficiency: 85%

Production: cy/day = 1,261

PIT RUN ROCK HAUL COSTS	2,494 cy @	\$5.03 /cy
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RIP RAP ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 2
QUARRY:	Lost Lake

MATERIAL: Rip Rap

DATE: 03/19/2018
BY: Ella Salkeld

[illegible]

Average Round Trip Distance (miles)

ROCK HAUL:

Truck type:	<u>D12</u>	No. trucks:	<u>1</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

Ave haul: \$0.66 /cy
Load: \$0.60 /cy
Develop: _____ /cy

Truck type: D10 No. trucks:
 Delay min.: 5 Efficiency: 85%

Production: cy/day = 960

RIP RAP ROCK HAUL COSTS

11 cy @ \$1.26 /cy

RIP RAP ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No 1
QUARRY:	N/A

MATERIAL: Waste

DATE: 02/13/2018
BY: Kirkpatrick

[illegible]

ROCK HAUL:

Truck type:	D12	No. trucks:	1
Delay min.:	6	Efficiency:	85%
Truck type:	D10	No. trucks:	
Delay min.:	5	Efficiency:	85%

Ave haul:	\$0.99	/cy
Load:	\$0.72	/cy
Compaction	-	/cy

Production: cy/day = 635

Waste Haul Cost

380 cy @ \$1.72 /cy

BRUSHING COST ANALYSIS	Brushing Type	\$/mi.
Pied Piper 341-18-50 Kraig Kirkpatrick 02/23/2018	Light (1)	956.00
	Medium (2)	1,237.00
	Heavy (3)	1,743.00

Total Cost= \$64,109

Page 1 of 3

Total Miles= 56.93
Avg. \$/mi. = \$1,126.10

Equipment Move-in Cost

Brush Cutter	\$361.00
Excavator C315	\$905.00

Additional Costs

Advanced brush removal w/315, \$/hr

Hrs	\$/Hr	\$
9	114.00	\$1,026.00
		\$0.00

Road Segment	Road Name	Measured Feet	Miles	Brushing Type	\$	Notes
B1	Lost Lake, August Fire, Quartz Cr - From Lower Nehalem Rd to HWY 26	53581	10.15	1	\$9,701.41	
B2	Lost Lake Quarry Road	2486	0.47	1	\$450.12	
B3		6963	1.32	1	\$1,260.73	
B4		1698	0.32	1	\$307.44	
B5		6582	1.25	1	\$1,191.74	
B6		2894	0.55	1	\$523.99	
B7		3144	0.60	1	\$569.25	
B8		1098	0.21	1	\$198.80	
B9		770	0.15	2	\$180.40	
B10		2264	0.43	1	\$409.92	
B11		1444	0.27	1	\$261.45	
B12		404	0.08	1	\$73.15	
B13		4420	0.84	1	\$800.29	
B14		2607	0.49	1	\$472.03	
B15		7660	1.45	1	\$1,386.92	
B16		200	0.04	1	\$36.21	
B17		175	0.03	1	\$31.69	
B18		590	0.11	1	\$106.83	
B19		1126	0.21	1	\$203.87	
B20		765	0.14	1	\$138.51	
B21		440	0.08	1	\$79.67	
B22		680	0.13	1	\$123.12	
B23		660	0.13	2	\$154.63	
B24		191	0.04	1	\$34.58	
B25		285	0.05	1	\$51.60	
B26		157	0.03	1	\$28.43	
B27		2026	0.38	1	\$366.83	
B28	Rottowash Road	12213	2.31	1	\$2,211.29	
B29		985	0.19	1	\$178.34	
B30		302	0.06	1	\$54.68	
B31		177	0.03	1	\$32.05	
B32		178	0.03	1	\$32.23	
B33	Portion of Quartz Cr. Road - jct. of August Fire South to Gate @ PL	14100	2.67	1	\$2,552.95	
B34		1869	0.35	1	\$338.40	
B35		3816	0.72	1	\$690.93	
B36		1152	0.22	1	\$208.58	
B37		70	0.01	3	\$23.11	
B38		292	0.06	3	\$96.39	
B39		750	0.14	2	\$175.71	
B40		496	0.09	2	\$116.20	
B41		972	0.18	1	\$175.99	
B42		890	0.17	1	\$161.14	
B43		1238	0.23	1	\$224.15	
B44		3177	0.60	1	\$575.23	
B45		3430	0.65	2	\$803.58	Snow break removal, 2hrs w/315
B46		142	0.03	1	\$25.71	
B47		2993	0.57	1	\$541.91	
B48		766	0.15	1	\$138.69	
B49		232	0.04	1	\$42.01	
B50	Portions of Sterling Ridge & Sterling Tie-Thru	10210	1.93	1	\$1,848.63	
B51		3050	0.58	2	\$714.55	
B52		1828	0.35	2	\$428.26	

Road Segment	Road Name	Measured Feet	Miles	Brushing Type	\$	Notes
B53		269	0.05	2	\$63.02	
B54		154	0.03	2	\$36.08	
B55		1043	0.20	1	\$188.85	
B56		655	0.12	1	\$118.59	
B57		800	0.15	1	\$144.85	
B58		4202	0.80	2	\$984.45	
B59		1384	0.26	2	\$324.24	
B60		100	0.02	2	\$23.43	
B61		150	0.03	2	\$35.14	
B62		7888	1.49	1	\$1,428.21	
B63		4895	0.93	1	\$886.29	
B64		532	0.10	2	\$124.64	
B65		200	0.04	1	\$36.21	
B66		858	0.16	1	\$155.35	
B67		343	0.06	1	\$62.10	
B68		138	0.03	1	\$24.99	
B69		879	0.17	1	\$159.15	
B70		385	0.07	1	\$69.71	
B71		1185	0.22	1	\$214.56	
B72		1052	0.20	1	\$190.48	
B73		585	0.11	1	\$105.92	
B74		770	0.15	1	\$139.42	
B75		1156	0.22	1	\$209.31	
B76		305	0.06	2	\$71.46	
B77		2445	0.46	2	\$572.82	
B78		381	0.07	3	\$125.77	
B79		100	0.02	2	\$23.43	
B80		2028	0.38	2	\$475.12	
B81		1053	0.20	2	\$246.70	
B82		267	0.05	2	\$62.55	
B83		3317	0.63	3	\$1,094.99	Advanced brush removal, 2hrs w/315
B84		515	0.10	3	\$170.01	Advanced brush removal, 1hrs w/315
B85		2357	0.45	2	\$552.20	
B86		175	0.03	2	\$41.00	
B87		343	0.06	2	\$80.36	
B88		238	0.05	3	\$78.57	
B89		1931	0.37	3	\$637.45	Advanced brush removal, 1hrs w/315
B90		1249	0.24	3	\$412.31	
B91		215	0.04	3	\$70.97	
B92		4661	0.88	3	\$1,538.66	
B93		412	0.08	2	\$96.52	
B94		982	0.19	3	\$324.17	
B95		552	0.10	3	\$182.22	
B96		578	0.11	3	\$190.81	
B97		467	0.09	2	\$109.41	
B98		546	0.10	2	\$127.92	
B99		571	0.11	2	\$133.77	
B100		626	0.12	2	\$146.66	

Road Segment	Road Name	Measured Feet	Miles	Brushing Type	\$	Notes
B101		323	0.06	1	\$58.48	
B102		849	0.16	3	\$280.27	Advanced brush removal, 1hrs w/315
B103		1206	0.23	3	\$398.12	Advanced brush removal, 2hrs w/315
B104		2468	0.47	2	\$578.20	
B105		419	0.08	2	\$98.16	
B106		4522	0.86	2	\$1,059.42	
B107		1239	0.23	2	\$290.27	
B108		586	0.11	2	\$137.29	
B109		593	0.11	2	\$138.93	
B110		2407	0.46	3	\$794.58	
B111		7413	1.40	3	\$2,447.13	
B112		1816	0.34	3	\$599.49	
B113		328	0.06	3	\$108.28	
B114		285	0.05	3	\$94.08	
B115		158	0.03	3	\$52.16	
B116		549	0.10	3	\$181.23	
B117		388	0.07	1	\$70.25	
B118		1286	0.24	1	\$232.84	
B119		204	0.04	2	\$47.79	
B120		176	0.03	1	\$31.87	
B121		1275	0.24	1	\$230.85	
B122	Sterling Ranch Road	20868	3.95	1	\$3,778.37	
B123		2758	0.52	2	\$646.15	
B124		273	0.05	2	\$63.96	
B125		7834	1.48	2	\$1,835.35	
B126		1742	0.33	1	\$315.41	
B127		3943	0.75	1	\$713.92	
B128		110	0.02	3	\$36.31	
B129		960	0.18	2	\$224.91	
B130		242	0.05	3	\$79.89	
B131		310	0.06	3	\$102.34	
B132		1395	0.26	2	\$326.82	
B133		529	0.10	1	\$95.78	
B134		1581	0.30	1	\$286.26	
B135		438	0.08	1	\$79.30	
B136		147	0.03	1	\$26.62	
B137		894	0.17	1	\$161.87	
B138		1286	0.24	1	\$232.84	
B139		115	0.02	3	\$37.96	Advanced brush removal, 1hrs w/315
B140		100	0.02	1	\$18.11	

Timber Sale Contract
341-18-50
Pied Piper

Engineered Emulsion Road Surface Stabilization Cost

**Road Segment I1 to I2
(0+00 to 90+00)**

	Gallons	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
Concentrate product	5,280									
Reclaimer		10								
Distributor Truck			10							
Material Transport				20						
Grader (14G)					10					
Roller w/ Approved Mister						10				
Technical Advisor							15			
Labor								12		
Labor										12

Total Quantity	5,280	10	10	20	10	10	10	15	12	12
Hourly Rate		\$350	\$200	\$125	\$100	\$85	\$100	\$50	\$50	\$50
Quantity Rate	\$3.25									
Move in Rate		\$3,500.00	\$190			\$778				

Project Cost	\$17,160.00	\$7,000.00	\$2,190.00	\$2,500.00	\$1,000.00	\$1,628.00	\$1,500.00	\$600.00	\$600.00	
Total Project Cost:									\$34,178.00	

Compiled by: W. Lawrence
03/05/2018

Sale:	Pied Piper
Date:	02/04/2019
By:	Ella Salkeld

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	0.50	0.3
Vibratory Roller	1.5	0.50	0.3

NOTE: Lost Lake Quarry Road	0.50	Mile
TOTAL=	0.50	Miles

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Pied Piper

ROAD CONSTRUCTION:

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 1			
	1A-1B, 2A-2B, 2C-2D,		
	2E-2F, 2G-2H, 3A-3B, 3C-3D,	90.15	\$82,207
	3E-3F		
	TOTALS	90.15	\$82,207

ROAD IMPROVEMENT:

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 2			
	I1-I2, I3-I4, I5-I6, I7-I8	353.35	\$104,026
	TOTALS	353.35	\$104,026

SPECIAL PROJECTS:

	<u>Description</u>	<u>Cost</u>
Project No. 3	Lost Lake Quarry Development, Rock Crushing and Stockpiling	\$269,252
Project No. 4	Roadside Brushing	\$55,875
Project No. 5	Road Stabilization	\$34,178
	TOTAL	\$359,305

MOVE IN:

<u>Equipment</u>	<u>Cost</u>
Dozer (D8)	\$1,406.00
Excavator (C330)	\$1,406.00
Excavator (C315)	\$805.00
Dozer (D6)	\$778.00
Dump Trucks (12cy x 3)	\$815.00
Highway Dump w/pup trailer (20cy x 2)	\$382.00
Grader (14G)	\$778.00
Vibratory Roller	\$778.00
Water Truck (2,500 gallon)	\$190.00
Brush Cutter	\$321.00
See move in for crushing on rock crushing summary	-
TOTAL	\$7,659.00

GRAND TOTAL **\$553,197**

Compiled By: Kraig Kirkpatrick

Date: 02/23/2018

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Pied Piper

NEW CONSTRUCTION: 90.15 STATIONS

1.71 MILES

ROAD: 1A-1B(5.00), 2A-2B(4.00), 2C-2D(30.35), 2E-2F(1.00),

POINTS: 2G-2H(1.50), 3A-3B(16.25), 3C-3D(24.9), 3E-3F(7.15)

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
1A-1B scatter outside of R/W, \$/ac	4.00	x	\$ 1,337	=	\$5,348.00
2A-2B scatter outside of R/W, \$/ac	3.00	x	\$ 1,337	=	\$4,011.00
2C-2D Existing road grade, Scatter outside R/W w/330, \$/hr	10.00		\$ 155	=	\$1,550.00
2E-2F Existing road grade, Scatter outside R/W w/330, \$/hr	1.00		\$ 155	=	\$155.00
2G-2H scatter outside of R/W, \$/ac	1.00		\$ 1,337	=	\$1,337.00
3A-3B Existing road grade, Scatter outside R/W w/330, \$/hr	5.00		\$ 155	=	\$775.00
3C-3D					
0+00-8+30 Existing road grade, Scatter outside R/W w/330, \$/hr	4.00		\$ 155	=	\$620.00
8+30-24+90 scatter outside of R/W, \$/ac	1.50		\$ 1,337	=	\$2,005.50
3E-3F Existing road grade, Scatter outside R/W w/330, \$/hr	4.00		\$ 155	=	\$620.00
				=	\$0.00
SUB TOTAL FOR CLEARING & GRUBBING					\$16,422

EXCAVATION

Material	Cy/amount	x	Rate	=	Cost
1A-1B					
Balanced construction, \$/sta.	3.0	x	\$122.00	=	\$366.00
Drift earth, \$/sta.	2.0	x	\$190.00	=	\$380.00
1+50 Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
1B Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2A-2B					
Balanced construction, \$/sta.	4.0	x	\$122.00	=	\$488.00
Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2C-2D Existing road grade, 0+00 - 30+35					
24+95 Reconstruct fill w/330, \$/hr	4.0	x	\$155.00	=	\$620.00
End-haul backfill from borrow site w/10-12cy dump, \$/hr	2.0	x	\$79.00	=	\$158.00
Fill compaction w/vib. roller, \$/hr	1.0	x	\$77.00	=	\$77.00
30+35 Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2E-2F					
Balanced construction, \$/sta.	1.0	x	\$122.00	=	\$122.00
Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
2G-2H					
Balanced construction, \$/sta.	1.5	x	\$122.00	=	\$183.00
Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
3A-3B Existing road grade, 0+00 - 16+25					
2+25-3+10 Sidecast pullback & hauled to waste area, \$/sta.	0.85	x	\$557.00	=	\$473.45
1+00-3+75 Existing road realignment, end-haul excavation, \$/cy	380	x	\$1.72	=	\$653.60
3C-3D Existing road grade, 0+00 - 8+30					
8+30-24+90 Balanced construction, \$/sta.	16.6	x	\$122.00	=	\$2,025.20
14+80, 24+90 Landing construction, \$/ldg	2.0	x	\$389.00	=	\$778.00
3E-3F Existing road grade, 0+00 - 7+15					
Landing construction, \$/ldg	1.0	x	\$389.00	=	\$389.00
SUB TOTAL FOR EXCAVATION					\$9,047

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
2A-2B					24+95	24"CPP	60	\$27.04	\$1,622.40
0+00	18"CPP	30	\$19.53	\$585.90	29+35	18"CPP	30	\$19.53	\$585.90
2C-2D					3C-3D				\$0.00
1+80	18"CPP	40	\$19.53	\$781.20	0+00	18"CPP	30	\$19.53	\$585.90
3+95	18"CPP	30	\$19.53	\$585.90					\$0.00
6+15	18"CPP	30	\$19.53	\$585.90					\$0.00
10+10	18"CPP	40	\$19.53	\$781.20					\$0.00
16+55	18"CPP	40	\$19.53	\$781.20					\$0.00
19+35	18"CPP	40	\$19.53	\$781.20					\$0.00
23+80	18"CPP	30	\$19.53	\$585.90					\$0.00

	Description	Quantity	Rate	Cost
Other/miscellaneous:				
Culvert stakes & markers:	6' x 2 1/2" white fiberglass posts	11	\$20.00	\$220.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION

Subtotal of Clearing, Exc., Culv.

\$8,483

\$33,951

SURFACING		Subgrade prep:	Description	Stations/ amount	x	Rate/ sta/amt	Cost
			Grade, Shape and Ditch 16'	90.15	x	\$24.83	\$2,238.42
			Subgrade Compaction	90.15	x	\$20.19	\$1,820.13

ROAD SEGMENT 1A to 1B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 5+00				
				Volume (CY) per		Number of				
Base Rock	4"-0" crushed	0+00-5+00	8	station	50	stations	5.00	250	\$4.83	\$1,208
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106
Subgrade Reinforcement	6"-0" pit-run	3+00-5+00	12	station	75	stations	2	150	\$5.03	\$755
Landings	6"-0" pit-run	1+50, 5+00	N/A	Landing	88	Landings	2	176	\$5.03	\$885

Total Rock for Road Segment:

1A to 1B

598

\$2,954

ROAD SEGMENT 2A to 2B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A to 2B		0+00 to 4+00				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-4+00	8	station	50	stations	4.00	200	\$4.83	\$966
Turnouts	4"-0" crushed	1+20	8	TO	22	TO's	1	22	\$4.83	\$106
Turnarounds	4"-0" crushed	2+50	8	TA	22	TA's	1	22	\$4.83	\$106
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106
Subgrade Reinforcement	6"-0" pit-run	2+00-4+00	12	station	75	stations	2	150	\$5.03	\$755
Landings	6"-0" pit-run	4+00	N/A	Landing	88	Landings	1	88	\$5.03	\$443

Total Rock for Road Segment:

2A to 2B

504

\$2,482

ROAD SEGMENT 2C to 2D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2C to 2D		0+00 to 30+35				
				Volume (CY) per		Number of				
Base Rock	4"-0" crushed	0+00-30+35	8	station	50	stations	30.35	1,519	\$4.83	\$7,337
Turnouts	4"-0" crushed	3+15,7+30,13+8 0,20+30,27+05	8	TO	22	TO's	5	110	\$4.83	\$531
Turnarounds	4"-0" crushed	27+05	8	TA	11	TA's	1	11	\$4.83	\$53
Junction Rock	4"-0" crushed	0+00	8	Junctions	11	Junctions	1	11	\$4.83	\$53
Curve Widening	4"-0" crushed		8	curve	11	curves	3	33	\$4.83	
Culvert Bedding/Backfill	3/4"-0" crushed	24+95	N/A	load	11	loads	6	66	\$4.83	\$319
Traction Rock	3/4"-0" crushed	13+80-30+35	2	station	13	stations	16.55	215	\$4.83	\$1,039
Subgrade Reinforcement	6"-0" pit-run	28+35-30+35	12	station	75	stations	2	150	\$5.03	\$755
Landings	6"-0" pit-run	30+35	N/A	Landing	88	Landings	1	88	\$5.03	\$443

Total Rock for Road Segment:

2C to 2D

2,203

\$10,529

ROAD SEGMENT 2E to 2F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2E to 2F		0+00 to 1+00				
				Volume (CY) per		Number of				
Base Rock	4"-0" crushed	1+00	8	station	50	stations	1.00	50	\$4.83	\$242
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106
Landings	6"-0" pit-run	1+00	N/A	Landing	88	Landings	1	88	\$5.03	\$443

Total Rock for Road Segment:

2E to 2F

160

\$790

ROAD SEGMENT				2G to 2H		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2G to 2H		0+00 to 1+50						
				Volume (CY) per		Number of						
Base Rock	4"-0" crushed	0+00-1+50	8	station	50	stations	1.50	75	\$4.83	\$362		
Turnarounds	4"-0" crushed	0+00	8	TA	22	TA's	1	22	\$4.83	\$106		
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106		
Landings	6"-0" pit-run	1+50	N/A	Landing	88	Landings	1	88	\$5.03	\$443		

Total Rock for Road Segment:

2G to 2H

207

\$1,017

ROAD SEGMENT			3A to 3B	POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B		0+00 to 16+25				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-16+25	8	station	50	stations	16.25	813	\$4.83	\$3,924
Turnouts	4"-0" crushed	3+65,8+95	8	TO	22	TO's	2	44	\$4.83	\$213
Turnarounds	4"-0" crushed	10+40	8	TA	22	TA's	1	22	\$4.83	\$106
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106
Subgrade Reinforcement	6"-0" pit-run	14+25-16+25	12	station	75	stations	2	150	\$5.03	\$755
Landings	6"-0" pit-run	16+25	N/A	Landing	88	Landings	1	88	\$5.03	\$443

Total Rock for Road Segment:

3A to 3B

1,139

\$5,547

ROAD SEGMENT				3C to 3D		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost		
Application	Rock Size and Type	Location	Depth of Rock (inches)	3C to 3D Volume (CY) per		0+00 to 24+90 Number of								
Base Rock	4"-0" crushed	0+00-24+90	8	station	50	stations	24.90	1,245	\$4.83	\$6,013				
Turnouts	4"-0" crushed	4+30,8+30,12+80,18+40	8	TO	22	TO's	4	88	\$4.83	\$425				
Turnarounds	4"-0" crushed	12+80,23+90	8	TA	22	TA's	2	44	\$4.83	\$213				
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106				
Traction Rock	3/4"-0" crushed	8+30-10+65,14+80-24+90	2	station	13	stations	12.45	162	\$4.83	\$782				
Turnouts	3/4"-0" crushed	8+30,18+40	2	TO	11	TO's	2	22	\$4.83	\$106				
Subgrade Reinforcement	6"-0" pit-run	13+80-15+80,22+90-24+90	12	station	75	stations	4	300	\$5.03	\$1,509				
Landings	6"-0" pit-run	18+40,24+90	N/A	Landing	88	Landings	2	176	\$5.03	\$885				
Total Rock for Road Segment:				3C to 3D				2,059						
ROAD SEGMENT				3E to 3F		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost		
Application	Rock Size and Type	Location	Depth of Rock (inches)	3E to 3F Volume (CY) per		0+00 to 7+15 Number of								
Base Rock	4"-0" crushed	0+00-7+15	8	station	50	stations	7.15	358	\$4.83	\$1,727				
Turnouts	4"-0" crushed	4+00	8	TO	22	TO's	1	22	\$4.83	\$106				
Turnarounds	4"-0" crushed	4+00	8	TA	22	TA's	1	22	\$4.83	\$106				
Junction Rock	4"-0" crushed	0+00	8	Junctions	22	Junctions	1	22	\$4.83	\$106				
Subgrade Reinforcement	6"-0" pit-run	5+15-7+15	12	station	75	stations	2	150	\$5.03	\$755				
Landings	6"-0" pit-run	7+15	N/A	Landing	88	Landings	1	88	\$5.03	\$443				
Total Rock for Road Segment:				3E to 3F				662						
												\$10,039		
Processing:														
Description												No.sta	Rate/sta	Cost
Spread & Compact Subgrade Reinforcement Rock w/dozer (6"-0"pr												10	\$31.54	\$315.40
Water, Process & Compact Base Rock (4"-0"):												90.15	\$56.48	\$5,091.67
Water, Process & Compact Surface Rock (1 1/2"-0"):												90.15	\$24.28	\$2,188.84

Compiled By: Kraig Kirkpatrick

Date: 02/23/2018

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Pied Piper

ROAD: 11-12(250.55), 13-14(70.55), 15-16(16.75), 17-18(15.5)

POINTS: _____

IMPROVEMENT: 353.35 STATIONS

6.69 MILES

CLEARING & GRUBBING

	Method	Acres/amount	x	Rate	=	Cost
15-16	Marked trees on cutbanks & Landing construction, \$/ac	0.3	x	\$1,337.00	=	\$401.10
			x		=	\$0.00
			x		=	\$0.00
			x		=	\$0.00
			x		=	\$0.00
			x		=	\$0.00

SUB TOTAL FOR CLEARING & GRUBBING

\$401

EXCAVATION

	Material	Cy/amount	x	Rate	=	Cost
11-12			x			
0+00-61+90	Load & haul ditch waste material, \$/sta.	61.9	x	\$22.92	=	\$1,418.75
66+30-117+95	Scatter ditch waste material, \$/sta.	51.7	x	\$12.41	=	\$640.98
126+90-128+60	Load & haul bank slough material w/315 & 10-12cy dump, \$	1	x	\$180.00	=	\$180.00
139+40	Load & haul bank slough material w/315 & 10-12cy dump, \$	1	x	\$180.00	=	\$180.00
13-14			x			
23+35, 57+35	Clean culvert inlets w/315, \$/hr	0.5		\$101.00	=	\$50.50
24+85	Load & haul bank slough material w/315 & 10-12cy dump, \$	0.5		\$180.00	=	\$90.00
			x		=	\$0.00
15-16	Landing Construction, \$/ldg	1	x	\$389.00		\$389.00

SUB TOTAL FOR EXCAVATION

\$2,949

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
11-12									
59+75	18"CPP	40	\$19.53	\$781.20					
91+00	18"CPP	40	\$19.53	\$781.20					
189+80	18"CPP	40	\$19.53	\$781.20					
238+70	18"CPP	50	\$19.53	\$976.50					

	Description	Quantity	Rate	Cost
Other/miscellaneous:				
Culvert stakes & markers:	6'X2 1/2" white fiberglass post	4	\$20.00	\$80.00
				\$0.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION

\$3,400

Subtotal of Clearing, Exc., Culv. \$6,750

SURFACING				Description				Stations/ amount	x	Rate/ sta/amt	Cost
Subgrade prep:				Grade, Shape and Ditch 16'				353.35	x	\$24.83	\$8,773.68
				Subgrade Compaction				353.35	x	\$20.19	\$7,134.14
ROAD SEGMENT 11 to 12				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 250+55					
				Volume (CY) per	Number of						
Surface Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	20	220	\$4.83	\$1,063	
Surfacing	3/4"-0" crushed	0+00-250+55	6	station	38	stations	250.55	9,521	\$4.83	\$45,986	
		+90,22+45,24+85,28+ 45,30+10,32+55,34+9 0,39+30,41+95,43+80 ,48+50,51+60,54+25, 56+00,58+00,66+30,7 4+20,76+40,82+85,89 +55,94+35,104+90,11 2+10,122+25,124+90, 126+90,131+50,134+ 30,146+20,153+95,15 7+40,161+70,166+20, 169+85,172+35,173+ 75,177+80,183+55,19	6	turnout	22	turnouts	51	1,122	\$4.83	\$5,419	
Turnouts	3/4"-0" crushed										
		61+90,63+50,90+70,9 1+00,117+95,168+20, 174+90,175+80,186+ 50,200+25,238+70,24 0+85,250+00	6	junction	22	junctions	13	286	\$4.83	\$1,381	
Junctions	3/4"-0" crushed		6	load	11	loads	22	242	\$4.83	\$1,169	
Curve Widening Surface	3/4"-0" crushed										
		59+75,91+00,189+80, 238+70	N/A	culvert	44	culverts	4	176	\$4.83	\$850	
Culvert Bedding and Backfill	3/4"-0" crushed		N/A	dissipator	11	dissipators	1	11	\$1.26	\$14	
Culvert Energy Dissipator	24"-6" riprap	117+35									
Total Rock for Road Segment:				I1 to I2				11,578			\$55,882
ROAD SEGMENT 13 to 14				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 70+55					
				Volume (CY) per	Number of						
Surface Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	15	165	\$4.83	\$797	
Surfacing	3/4"-0" crushed	0+00-14+05	6	station	38	stations	14.05	534	\$4.83	\$2,579	
Total Rock for Road Segment:				I3 to I4				699			\$3,376
ROAD SEGMENT 15 to 16				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	I5 to I6		0+00 to 16+75					
				Volume (CY) per	Number of						
Subgrade Leveling Rock	4"-0" crushed		N/A	load	11	loads	5	55	\$4.83	\$266	
Surfacing	4"-0" crushed	0+00-16+75	4	station	25	stations	16.75	419	\$4.83	\$2,023	
Turnouts	4"-0" crushed	9+00	4	turnout	22	turnout	1	22	\$4.83	\$106	
Turnaround	4"-0" crushed	14+70	4	turnaround	11	turnaround	1	11	\$4.83	\$53	
Junctions	4"-0" crushed	0+00	4	junction	11	junctions	1	11	\$4.83	\$53	
Traction Rock	3/4"-0" crushed	0+85-9+00	2	station	13	stations	8.2	106	\$4.83	\$512	
Subgrade Reinforcement	6"-0" pit-run	14+75-16+75	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit run	15+25, 16+75	N/A	Landing	88	Landings	2	176	\$5.03	\$885	
Total Rock for Road Segment:				I5 to I6				950			\$4,652
ROAD SEGMENT 17 to 18				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	I7 to I8		0+00 to 15+50					
				Volume (CY) per	Number of						
Subgrade Leveling Rock	3/4"-0" crushed		N/A	load	11	loads	10	110	\$4.83	\$531	
Subgrade Leveling Rock	4"-0" crushed		N/A	load	11	loads	5	55	\$4.83	\$266	
Subgrade Reinforcement	6"-0" pit-run	13+50-15+50	12	station	75	stations	2	150	\$5.03	\$755	
Landings	6"-0" pit run	15+50	N/A	Landing	88	Landings	1	88	\$5.03	\$443	
Total Rock for Road Segment:				I7 to I8				403			\$1,994
Processing:				Description				No.sta	Rate/sta	Cost	
11-12, 0+00 to 90+00 w/Proj. No5				Spread & Compact Subgrade Reinforcement Rock w/dozer (6"-0"pr)				4	31.54	\$126	
				Water, Process & Compact:				263.35	\$56.48	\$14,874	
				Traction Rock Water, Process & Compact				8.20	\$56.48	\$463	
SUB TOTAL FOR SURFACING				24"-6" rr	6"-0"pr	4"-0" crushed	3/4"-0" crushed	Total			\$97,275
				11	564	573	12,482	13,630			
SPECIAL PROJECTS				Description	Cy/Amount	Rate	Cost				
				pit-run development	564	See Proj. 4					
				riprap development	11	See Proj. 4					
SUB TOTAL FOR SPECIAL PROJECTS							\$0				
				Subtotal of Surfacing & Spec. Proj.				\$97,275			
				Subtotal of Clearing, Exc., Culv.				\$6,750			
GRAND TOTAL								\$104,026			

CRUSHED ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 1 and No.2
Stockpile:	Lost Lake

DATE: 03/19/2018
BY: Ella Salkeld

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>2</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$3.56	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>5</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

Truck type: D10 No. trucks:
 Delay min.: 5 Efficiency: 85%

Production: cy/day = 1,335

CRUSHED ROCK HAUL COSTS 18,656 cy @ \$4.83 /cy

PIT RUN ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 1 and No. 2
QUARRY:	Lost Lake

DATE: 03/19/2018
BY: Ella Salkeld

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>2</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$3.77	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

Truck type:	<u>D12</u>	No. trucks:	<u>5</u>
Delay min.:	<u>6</u>	Efficiency:	<u>85%</u>

Truck type: D10 No. trucks:
 Delay min.: 5 Efficiency: 85%

Production: cy/day = 1,261

PIT RUN ROCK HAUL COSTS	2,494 cy @	\$5.03 /cy
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RIP RAP ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No. 2
QUARRY:	Lost Lake

MATERIAL: Rip Rap

DATE: 03/19/2018
BY: Ella Salkeld

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES								Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH		
I1-I2	250.55	11									

ROCK HAUL:

Truck type:	D12	No. trucks:	1
Delay min.:	6	Efficiency:	85%
Truck type:	D10	No. trucks:	
Delay min.:	5	Efficiency:	85%

Ave haul: \$0.66 /cy
Load: \$0.60 /cy
Develop: _____ /cy

Production: cy/day = 960

RIP RAP ROCK HAUL COSTS

11 cy @ \$1.26 /cy

RIP RAP ROCK COST

SALE NAME:	Pied Piper
PROJECT:	No 1
QUARRY:	N/A

MATERIAL: Waste

DATE: 02/13/2018
BY: Kirkpatrick

[illegible]

ROCK HAUL:

Truck type:	D12	No. trucks:	1
Delay min.:	6	Efficiency:	85%
Truck type:	D10	No. trucks:	1
Delay min.:	5	Efficiency:	85%

Ave haul:	\$0.99	/cy
Load:	\$0.72	/cy
Compaction	-	/cy

Production: cy/day = 635

Waste Haul Cost

380 cy @ \$1.72 /cy

SUMMARY OF ROCK DEVELOPMENT AND CRUSHING COSTS

PROJECT NO. <u>4</u>	Timber Sale Name: <u>Pied Piper</u>
Quarry: <u>Lost Lake Quarry</u>	Swell: _____
Location: <u>SW 1/4, SW 1/4, Sec.17, T4N, R7W</u>	Shrink: <u>16%</u>
County: <u>Clatsop</u>	
By: <u>W. Lawrence / K. Kirkpatrick</u>	Loading Hopper: <u>Yes</u>
Date: <u>02/23/2018</u>	

ROCK SIZE	REJECT	GRADATION	STOCKPILE CU. YDS.	TRUCK MEAS CU. YDS.	TOTAL CU. YDS.
3/4"-0"	2%	CR		12,947	12,947
1-1/2"-0"	2%	CR	5,000		5,800
4"-0"	2%	CR	5,000	5,709	11,509
6"-0"		PR		2,494	2,494
24"-6"		RR		11	11
36"		RR			
TOTAL CUBIC YARDS OF ROCK:			10,000	21,161	32,761

1) MOBILIZATION & SET UP:

EQUIPMENT	QUANTITY	RATE	COST	EQUIPMENT	QUANTITY	RATE	COST
Dump Trucks	2	\$163	\$326	Off Highway Dump Truck	1	\$553	\$553
D6 Cat	1	\$778	\$778	Screening Plant	1	\$553	\$553
Drill & Compressor	2	\$1,406	\$2,812	Loading Hopper	1	\$553	\$553
Powder	2	\$351	\$703	Loader	1	\$805	\$805
Excavator	2	\$1,406	\$2,812	Fire Truck	1	\$190	\$190
				3 Stage Crusher	1	\$2,891	\$2,891

SUB TOTAL FOR MOBILIZATION

\$12,975

EQUIPMENT SET UP	TIMES	RATE	COST
3 Stage Crusher	1	\$3,439	\$3,439
Screening Plants	2	\$293	\$586
Loading Hopper	1	\$293	\$293
Original Calibration	1	\$544	\$544

SUB TOTAL FOR SET UP COSTS

\$4,862

TOTAL MOBILIZATION & SET UP COSTS**\$17,836****2) CLEARING & GRUBBING**

DESCRIPTION	QUANTITY	UNIT	RATE	COST
Pile & Burn Slash and Stumps(\$/Ac.)	1.5	Acers	\$2,702	\$4,053

TOTAL CLEARING & GRUBBING COSTS**\$4,053**

3) EXCAVATION

MATERIAL DESCRIPTION	QUANTITY	UNIT	RATE	COST
Overburden Removal (excavate, load haul, spread)(C330,D6,D.Truck 2X)	8	Hours	\$426.00	\$3,408
Quarry access road improvement (C330)	4	Hours	\$155.00	\$620

TOTAL EXCAVATION COSTS

\$4,028

4) DEVELOP ROCK

ROCK SUMMARY			METHOD	%	QUANTITY	RATE	COST
Type	Cu. yd. Vol.	Weight	Ripping			\$2.20	
crushed	30,256	92%	Drill & shoot	100%	33,366	\$2.30	\$76,742
pit run	2,494	8%	Oversize red	5%	1,638	\$5.80	\$9,498
rip rap	11	0%	Other				
Total	32,761						
reject	605	1.8%					

TOTAL ROCK DEVELOPMENT COSTS

\$86,240

5) CALIBRATION & TESTING

DESCRIPTION	NO.	\$/TEST	COST
Calibrate	3	\$507.00	\$1,521
Calibrate			
Test	15	\$57.30	\$867
Test			

TOTAL CALIBRATION & TESTING COSTS

\$2,388

6) FEEDING & LOADING

DESCRIPTION	CU. YD. QUANTITY	COST CU. YD.	TOTAL COST
Dig & Feed Rock	30,861	\$0.88	\$27,276

TOTAL FEEDING & LOADING COSTS

\$27,276

7) ROCK CRUSHING

ROCK SIZE	ROCK TYPE	CU. YD. QUANTITY	CRUSHER TYPE	HOURLY PRODUCTION	RATE CU. YD.	TOTAL COST
3/4"-0"	crushed	12,947	3 stage w/s	110	\$3.54	\$45,785
1-1/2"-0"	crushed	5,800	3 stage w/s	120	\$3.24	\$18,802
4"-0"	crushed	11,509	2 stage w/s	140	\$2.48	\$28,526

TOTAL ROCK CRUSHING COSTS

\$93,113

8) STOCKPILING

STOCKPILE SITE PREPARATION

Equipment	Hours	Rate	Total
Dozer	4	\$120.00	\$480.00
Compactor		\$72.00	
Grader		\$90.00	
Excavator		\$138.00	

Rock for Floor (CY)	\$/CY Haul	Total

\$480.00

SUB TOTAL \$480

HAUL & STOCKPILE		# of	CU. YDS.	RATE	COST
STOCKPILE LOCATION	SIZE				
1.					
2. Lost Quarry Stockpile Site	1-1/2"-0"	2	5,800	\$2.55	\$14,776
3. Lost Quarry Stockpile Site	4"-0"	2	5,800	\$2.55	\$14,776
4.					
5.					
6.					

SUB TOTAL \$29,552

TOTAL STOCKPILING COSTS \$30,032

9) MISCELLANEOUS COSTS

DESCRIPTION	COST
Load, Haul, and Spread the reject material at the waste area.	\$2,287
\$3.78 /CY 605 CY	
Final Quarry Dev., Access Road Const., Waterbarring, Drainage, Block Quarry Access	\$2,000

TOTAL MISCELLANEOUS COSTS \$4,287

10) GRAND TOTAL: \$269,252

\$/Cubic Yard \$8.90

Footnotes:

BRUSHING COST ANALYSIS
Pied Piper
341-18-50
Kraig Kirkpatrick
02/23/2018

Brushing Type	\$/mi.
Light (1)	850.00
Medium (2)	1,100.00
Heavy (3)	1,550.00

Total Cost= \$55,875

Total Miles= 56.93

Avg. \$/mi.= \$981.47

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Additional Costs

Advanced brush removal w/315, \$/hr

Hrs	\$/Hr	\$
9	101.00	\$909.00
		\$0.00

Road Segment	Road Name	Measured Feet	Miles	Brushing Type	\$	Notes
B1	Lost Lake, August Fire, Quartz Cr	53581	10.15	1	\$8,625.73	
B2	Lost Lake Quarry Road	2486	0.47	1	\$400.21	
B3		6963	1.32	1	\$1,120.94	
B4		1698	0.32	1	\$273.35	
B5		6582	1.25	1	\$1,059.60	
B6		2894	0.55	1	\$465.89	
B7		3144	0.60	1	\$506.14	
B8		1098	0.21	1	\$176.76	
B9		770	0.15	2	\$160.42	
B10		2264	0.43	1	\$364.47	
B11		1444	0.27	1	\$232.46	
B12		404	0.08	1	\$65.04	
B13		4420	0.84	1	\$711.55	
B14		2607	0.49	1	\$419.69	
B15		7660	1.45	1	\$1,233.14	
B16		200	0.04	1	\$32.20	
B17		175	0.03	1	\$28.17	
B18		590	0.11	1	\$94.98	
B19		1126	0.21	1	\$181.27	
B20		765	0.14	1	\$123.15	
B21		440	0.08	1	\$70.83	
B22		680	0.13	1	\$109.47	
B23		660	0.13	2	\$137.50	
B24		191	0.04	1	\$30.75	
B25		285	0.05	1	\$45.88	
B26		157	0.03	1	\$25.27	
B27		2026	0.38	1	\$326.16	
B28	Rottowash Road	12213	2.31	1	\$1,966.11	
B29		985	0.19	1	\$158.57	
B30		302	0.06	1	\$48.62	
B31		177	0.03	1	\$28.49	
B32		178	0.03	1	\$28.66	
B33	Portion of Quartz Cr. Road	14100	2.67	1	\$2,269.89	
B34		1869	0.35	1	\$300.88	
B35		3816	0.72	1	\$614.32	
B36		1152	0.22	1	\$185.45	
B37		70	0.01	3	\$20.55	
B38		292	0.06	3	\$85.72	
B39		750	0.14	2	\$156.25	
B40		496	0.09	2	\$103.33	
B41		972	0.18	1	\$156.48	
B42		890	0.17	1	\$143.28	
B43		1238	0.23	1	\$199.30	
B44		3177	0.60	1	\$511.45	
B45		3430	0.65	2	\$714.58	Snow break removal, 2hrs w/315
B46		142	0.03	1	\$22.86	
B47		2993	0.57	1	\$481.83	
B48		766	0.15	1	\$123.31	
B49		232	0.04	1	\$37.35	
B50	Portions of Sterling Ridge & Sterling Tie-Thru	10210	1.93	1	\$1,643.66	
B51		3050	0.58	2	\$635.42	

B52		1828	0.35	2	\$380.83	
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Road Segment	Road Name	Measured Feet	Miles	Brushing Type	\$	Notes
B53		269	0.05	2	\$56.04	
B54		154	0.03	2	\$32.08	
B55		1043	0.20	1	\$167.91	
B56		655	0.12	1	\$105.45	
B57		800	0.15	1	\$128.79	
B58		4202	0.80	2	\$875.42	
B59		1384	0.26	2	\$288.33	
B60		100	0.02	2	\$20.83	
B61		150	0.03	2	\$31.25	
B62		7888	1.49	1	\$1,269.85	
B63		4895	0.93	1	\$788.02	
B64		532	0.10	2	\$110.83	
B65		200	0.04	1	\$32.20	
B66		858	0.16	1	\$138.13	
B67		343	0.06	1	\$55.22	
B68		138	0.03	1	\$22.22	
B69		879	0.17	1	\$141.51	
B70		385	0.07	1	\$61.98	
B71		1185	0.22	1	\$190.77	
B72		1052	0.20	1	\$169.36	
B73		585	0.11	1	\$94.18	
B74		770	0.15	1	\$123.96	
B75		1156	0.22	1	\$186.10	
B76		305	0.06	2	\$63.54	
B77		2445	0.46	2	\$509.38	
B78		381	0.07	3	\$111.85	
B79		100	0.02	2	\$20.83	
B80		2028	0.38	2	\$422.50	
B81		1053	0.20	2	\$219.38	
B82		267	0.05	2	\$55.63	
B83		3317	0.63	3	\$973.74	Advanced brush removal, 2hrs w/315
B84		515	0.10	3	\$151.18	Advanced brush removal, 1hrs w/315
B85		2357	0.45	2	\$491.04	
B86		175	0.03	2	\$36.46	
B87		343	0.06	2	\$71.46	
B88		238	0.05	3	\$69.87	
B89		1931	0.37	3	\$566.87	Advanced brush removal, 1hrs w/315
B90		1249	0.24	3	\$366.66	
B91		215	0.04	3	\$63.12	
B92		4661	0.88	3	\$1,368.29	
B93		412	0.08	2	\$85.83	
B94		982	0.19	3	\$288.28	
B95		552	0.10	3	\$162.05	
B96		578	0.11	3	\$169.68	
B97		467	0.09	2	\$97.29	
B98		546	0.10	2	\$113.75	
B99		571	0.11	2	\$118.96	
B100		626	0.12	2	\$130.42	

[illegible]

Sale:	Pied Piper
Date:	22-Feb-18
By:	Ella Salkeld

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	1.00	0.7
Vibratory Roller	1.5	1.00	0.7

NOTE: Lost Lake Quarry Road	1.00	Mile
	TOTAL=	1.00 Miles

**Pied Piper
FY 2018
TIMBER CRUISE REPORT**

1. **Sale Area Location:** Areas 1, 2, and 3 are located in portions of Sections 7, 8, 16, 17 and 18 of T4N, R7W, W.M., Clatsop County, Oregon
2. **Fund Distribution:** Fund: BOF 100% CSL 0%
Tax Code: 8-01 100%
3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	Non-Merchant able Acres	Stream Buffer Acres	New R/W Acres	Existing RW Acres	Green Tree Area Acres	Net Acreage	Survey Method
1	Modified Clearcut	54	0	0	<1	3	0	51	GIS
2	Modified Clearcut	79	3	1	1	2	1	71	GIS
3	Modified Clearcut	59	0	0	3	0	0	56	GIS
4	R/W (Out-of-unit)	2	2	N/A	N/A	N/A	N/A	0	Length x Width
4	R/W (In-unit)	4	2	N/A	N/A	N/A	N/A	2	Length x Width
TOTALS		198	7	1	4	5	1	180	

4. **Cruisers and Cruise Dates:** Areas 1, 2, and 3 were cruised by Bryce Rodgers, John Choate, Matt Dimick, Cody Valencia, and Ella Salkeld from February 14th through February 20th, 2018.
5. **Cruise Method and Computation:** Area 1 is a modified clearcut unit. A variable plot cruise with a 40 BAF was used for this Area. The plots were located on a 5 chain by 3 chain grid, with a count/grade plot ratio of 2:1. A total of 34 plots were sampled.

Areas 2 and 3 are modified clearcut units. A variable plot cruise with a 40 BAF for conifers and a 33.61 BAF was used for hardwoods in these Areas. The plots were located on a 6 chain by 3 chain grid, with a count/grade plot ratio of 2:1. A total of 76 plots were sampled.

Area 4 R/W Right-of-way volume was calculated by multiplying the R/W acreage and the average volume per acre from the plots in Areas 2 and 3.

Cruisers used Allegro 2 data collectors that were downloaded to the Atterbury Super A.C.E. program at the Astoria District for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria District office.

<u>AREA</u>	<u>PROJECT</u>	<u>TRACT</u>	<u>CRUISE TYPE</u>
1	Pied Piper	A1	00MC, TK
2 and 3	Pied Piper	A23	00MC, TK
4	Pied Piper	R/W	TK

Timber Description: Area 1 is an approximately 65 year old stand of Douglas-fir, with some western hemlock and red alder. The average take Douglas-fir tree size is approximately 18 inches DBH, with an average merchantable tree height of 54 feet. The average hemlock take tree size is approximately 20 inches in DBH, with an average merchantable tree height of 53 feet. The average red alder take tree size for harvest is approximately 16 inches DBH, with an average merchantable tree height of 47 feet. The average volume per acre to be harvested (net) is approximately 29 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Areas 2 and 3 are approximately 70 year old stands of red alder, Douglas-fir, western hemlock, with some Sitka Spruce and bigleaf maple cedar. The average take Douglas-fir tree size is approximately 21 inches DBH, with an average merchantable tree height of 71 feet. The average take hemlock tree size is approximately 16 inches DBH, with an average merchantable tree height of 39 feet. The average take red alder tree size for harvest is approximately 17 inches DBH, with an average merchantable tree height of 55 feet. The average volume per acre to be harvested (net) is approximately 30 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Area 4 R/W is similar to the timber description mentioned above in the timber sale areas 2 and 3. The average volume 30 MBF/Acre (net).

6. Statistical Analysis: (See also "Statistics Reports," attached.)

Area	Target CV	Target SE%	Actual CV	Actual SE%
1	55	9	46.4	8.0
2 and 3	60	8	45.7	5.2

The statistics are for all areas and Take and Leave trees combined based on Net BF/Acre.

7. Take Volumes by Species and Log Grades for All Sale Areas by MBF: (See "Species, Sort Grade-Board Feet Volumes (Project)", "Statistics (Project)", and the "Stand Table Summary" attached). Volumes do not include "in-growth." The majority of defect and breakage was taken out during the cruise.

Conifer

Species	DBH	Net Vol. MBF	2 Saw	3Saw	4 Saw	% D & B	% Sale
Douglas-fir	19	2,531	1,847	553	131	0.6	48
Western Hemlock/true fir	17	527	341	142	44	1.4	10
Sitka Spruce	17	126	20	70	36	0.5	2
Western red cedar	19	73	-	66	7	-	1

Hardwoods

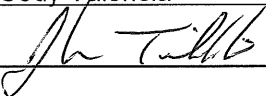
Species	DBH	Net Vol. MBF	12"+	10-12"	8-10"	6-8"	% D & B	% Sale
Red Alder	16	1,966	521	611	369	465	0.3	37
Bigleaf Maple	17	86	-	13	20	53	1.5	2

TOTAL NET VOLUME

5,309 MBF

8. Prepared by: Cody Valencia

Date: 2/22/2018

10. Approved by: 

Date: 2/15/2018

11. Attachments: Cruise Plans & Maps (6 pages)
Species, Sort, Grade Report (4 pages)
Statistics Reports (10 pages)
Log Stock Table Report MBF (3 pages)
Stand Table Summary (2 pages)

Revised August, 2002

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Pied Piper **Area(s)** 1

Harvest Type: Modified Clear Cut

Approx. Cruise Acres: 53 **Estimated CV%** 55 Net BF or
BA/Acre **SE% Objective** 9

Planned Sale Volume: 1,666 MBF **Estimated Sale Area Value/Acre:** \$ 13,600

A. Cruise Goals: (a) Grade minimum 80 trees:

Determine log grades for sale value; Determine snag and leave tree species and sizes;
Determine "diameter limit" harvest parameters;

B. Cruise Design:

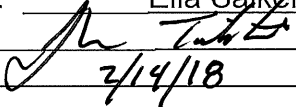
- 1. Plot Cruises:** Conifer BAF 40 Full point
Cruise Line Direction(s) 33/213
Cruise Line Spacing 5 chains (330 Feet)
Cruise Plot Spacing 3 chains (198 Feet)
Grade/Count Ratio 1:2

Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least ½ chain outside the buffer. Grade all alder.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods. Record dbh to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of dob at 16' form point. Generally, use 7" outside bark for trees less than 18" dbh and 40% of dob @ FP for trees greater than 18" dbh.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record log segments in "standard" 32" and 40' log lengths whenever possible. Do not record odd segments just to maximize grade. The maximum segment length is 40'. The minimum segment length is 12' for conifer and 8' for hardwoods. Minimum merchantable diameter for conifer is 8" dbh and 10" dbh for hardwoods. One foot of trim is assumed for each merchantable segment.

- 6. Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple); DL(Douglas-fir over 30"dbh); HL(Western hemlock over 30" dbh); SL(Sitka spruce over 30" dbh); CL (Western red cedar over 30" dbh); NFL (Noble fir over 30" dbh); SFL (Silver fir over 30" dbh)
B. Sort: Use code "1" (Domestic).
C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; 0 = Cull
Hardwoods: Alder Grades: 12" + = 2 Sawmill; 10"-12" = 3 Sawmill; 10"-6" = 4 Sawmill; and; 0 = Cull.
- 7. Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.
- 8. Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points. On "measure/grade" plots paint the tree diameter on each tree starting with the first tree right of the cruise line direction and continuing clockwise.
- 9. Cruising Equipment:** Relaskop, Rangefinder, Biltmore Stick, Compass, Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging.
- 10. Attachments:** A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, BAF or plot size, measure/count plot ratio, north arrow, and scale bar.

Cruise Design by: Ella Salkeld
Approved by: 
Date: 2/14/18

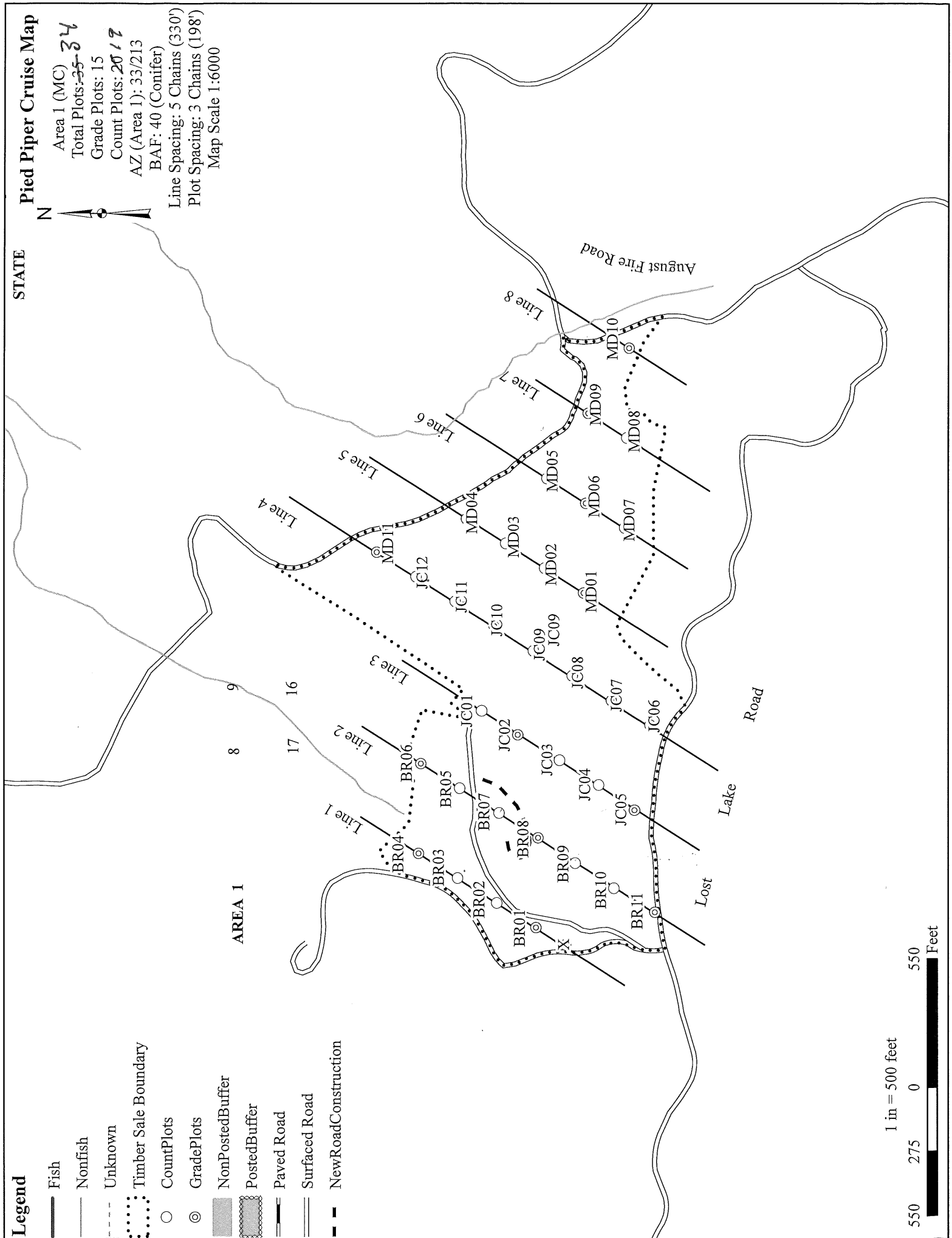
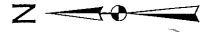
Legend

- Fish
- Nonfish
- Unknown
- Timber Sale Boundary
- CountPlots
- GradePlots
- NonPostedBuffer
- PostedBuffer
- Paved Road
- Surfaced Road
- NewRoadConstruction

STATE

Pied Piper Cruise Map

Area 1 (MC) ~~35~~ 34
 Total Plots: 15
 Grade Plots: 15
 Count Plots: 20 / 7
 AZ (Area 1): 33/213
 BAF: 40 (Conifer)
 Line Spacing: 5 Chains (330')
 Plot Spacing: 3 Chains (198')
 Map Scale 1:6000



1 in = 500 feet



**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Pied Piper **Area(s)** 2 and 3

Harvest Type: Modified Clearcut

Approx. Cruise Acres: 127 **Estimated CV%** 60 Net BF or
BA/Acre **SE% Objective** 8

Planned Sale Volume: 5,059 MBF **Estimated Sale Area Value/Acre:** \$ 15,933

A. Cruise Goals: (a) Grade minimum 80 trees:

Determine log grades for sale value; Determine snag and leave tree species and sizes;
Determine "diameter limit" harvest parameters;

B. Cruise Design:

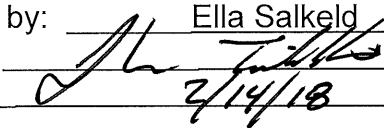
- 1. Plot Cruises:** Conifer BAF 40 Full point
Hardwood BAF 33.36 Full Point
Cruise Line Direction(s) N, S
Cruise Line Spacing 6 chains (396 Feet)
Cruise Plot Spacing 3 chains (198 Feet)
Grade/Count Ratio 1:2

Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least 1/2 chain outside the buffer. Grade all alder.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods. Record dbh to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of dob at 16' form point. Generally, use 7" outside bark for trees less than 18" dbh and 40% of dob @ FP for trees greater than 18" dbh.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record log segments in "standard" 32" and 40' log lengths whenever possible. Do not record odd segments just to maximize grade. The maximum segment length is 40'. The minimum segment length is 12' for conifer and 8' for hardwoods. Minimum merchantable diameter for conifer is 8" dbh and 10" dbh for hardwoods. One foot of trim is assumed for each merchantable segment.

- 6. Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple); DL(Douglas-fir over 30"dbh); HL(Western hemlock over 30" dbh); SL(Sitka spruce over 30" dbh); CL (Western red cedar over 30" dbh); NFL (Noble fir over 30" dbh); SFL (Silver fir over 30" dbh)
B. Sort: Use code "1" (Domestic).
C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; 0 = Cull
Hardwoods: Alder Grades: 12" + = 2 Sawmill; 10"-12" = 3 Sawmill; 10"-6" = 4 Sawmill; and; 0 = Cull.
- 7. Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.
- 8. Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points. On "measure/grade" plots paint the tree diameter on each tree starting with the first tree right of the cruise line direction and continuing clockwise.
- 9. Cruising Equipment:** Relaskop, Rangefinder, Biltmore Stick, Compass, Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging.
- 10. Attachments:** A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, BAF or plot size, measure/count plot ratio, north arrow, and scale bar.

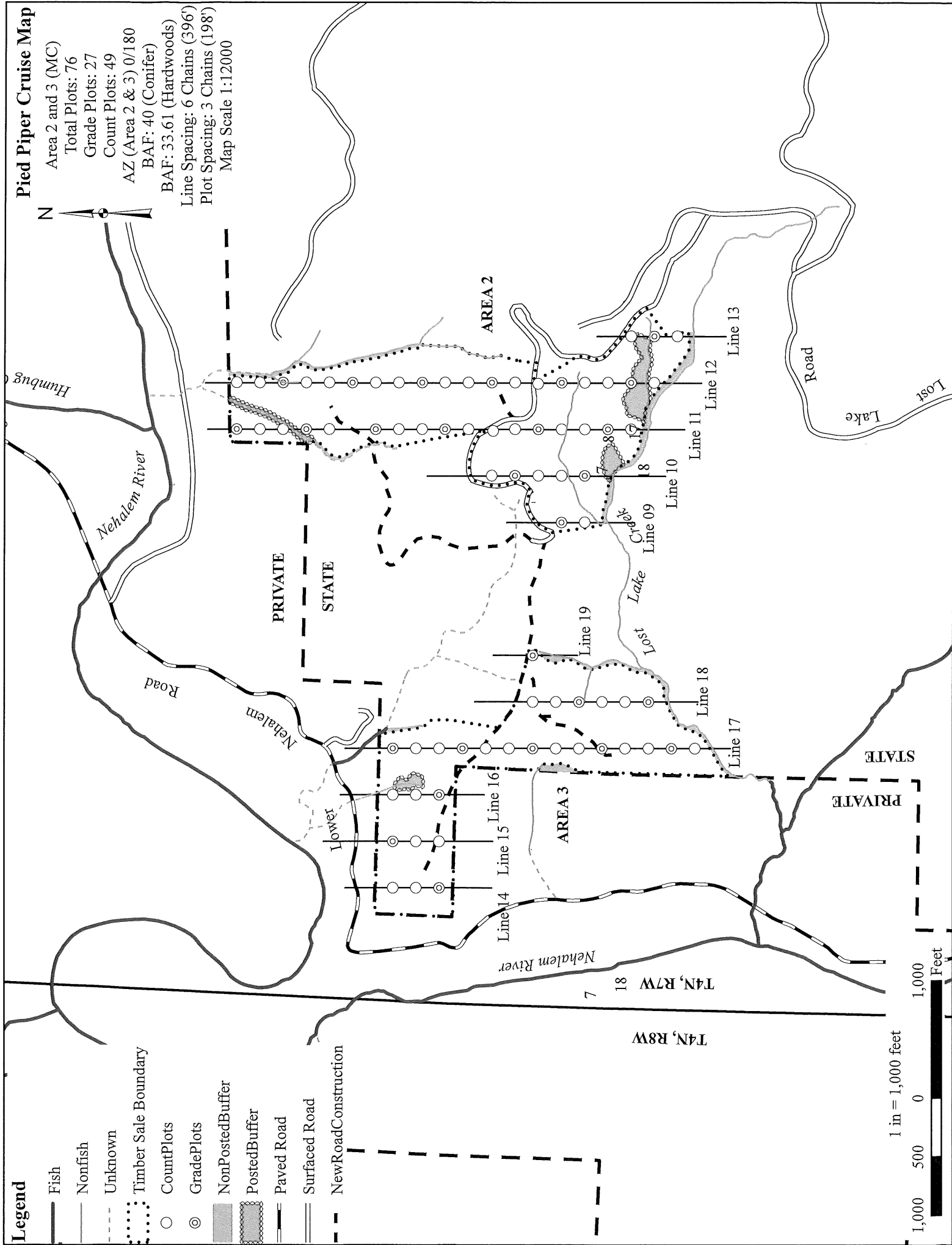
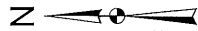
Cruise Design by: Ella Salkeld
Approved by: 
Date: 2/14/18

Legend

- Fish
- Nonfish
- Unknown
- Timber Sale Boundary
- CountPlots
- GradePlots
- NonPostedBuffer
- PostedBuffer
- Paved Road
- Surfaced Road
- NewRoadConstruction

Pied Piper Cruise Map

Area 2 and 3 (MC)
 Total Plots: 76
 Grade Plots: 27
 Count Plots: 49
 AZ (Area 2 & 3) 0/180
 BAF: 40 (Conifer)
 BAF: 33.61 (Hardwoods)
 Line Spacing: 6 Chains (396')
 Plot Spacing: 3 Chains (198')
 Map Scale 1:12000



Species, Sort Grade - Board Foot Volumes (Project)

T04N R07W S07 TyTK 51.00
 T04N R07W S07 TyTK 127.00
 T04N R07W S07 TyTK 2.00

Project: **PIEDP**
 Acres **180.00**

Page **1**
 Date **2/22/2018**
 Time **2:21:21PM**

Spp	So Gr T rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre	
			Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf		
							4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99						
H	DOCU															12	16		0.00	2.2
H	DO2S	64	.7	1,907	1,893	341			46	54	7		9	84		35	16	374	2.44	5.1
H	DO3S	27		791	791	142		100			6	9	36	49		33	8	86	0.92	9.2
H	DO4S	9	10.4	271	243	44		100			66	34				19	7	24	0.50	10.3
H Totals		10	1.4	2,969	2,927	527		35	29	35	11	5	16	68		26	10	110	1.15	26.7
D	DOCU															8	16		0.00	2.2
D	DO2S	72	.5	10,314	10,259	1,847			38	62	0	0	7	92		39	16	443	2.48	23.2
D	DO3S	22	.6	3,092	3,074	553		77	8	14	4	7	18	72		36	9	110	0.95	27.9
D	DO4S	6	1.4	737	726	131		100			62	35	3			20	6	27	0.46	26.4
D Totals		48	.6	14,143	14,060	2,531		22	29	49	4	3	10	83		31	10	177	1.40	79.6
A	DOCU															9	17		0.00	1.6
A	DO1S	26		2,897	2,897	521			90	10		11	10	80		37	14	264	1.83	11.0
A	DO2S	31	.5	3,409	3,392	611		47	53			24	5	70		36	12	175	1.35	19.4
A	DO3S	19	.6	2,062	2,049	369		91	9		1	11	13	76		36	10	127	0.99	16.1
A	DO4S	24		2,581	2,581	465		100			30	28	6	36		26	7	40	0.59	64.0
A Totals		37	.3	10,949	10,919	1,965 1,966		55	42	3	7	19	8	66		30	9	97	0.96	112.1
S	DO2S	15		109	109	20			100				100			32	13	190	1.59	.6
S	DO3S	56	.9	393	390	70		8		92				100		40	14	421	3.04	.9
S	DO4S	29		197	197	36		100				16		84		35	6	55	0.61	3.6
S Totals		2	.5	700	697	125 126		33	16	51		4	16	80		35	8	137	1.21	5.1
M	DOCU															4	15		0.00	1.3
M	DO2S	15		72	72	13			100				100			30	13	180	1.70	.4
M	DO3S	23		108	108	19 20		100				66		34		32	10	118	1.29	.9
M	DO4S	62	2.4	300	293	53		100			10	29	10	51		31	7	52	0.81	5.7
M Totals		2	1.5	480	473	85 86		85	15		6	49	6	39		27	9	57	0.91	8.3
C	DO3S	89		364	364	66		100					67	33		35	9	108	1.25	3.4
C	DO4S	11		41	41	7		100			100					18	6	20	0.44	2.0
C Totals		1		405	405	73		100			10		60	30		29	8	75	1.06	5.4
Totals			0.6	29,646	29,479	5,306 5,309		38	33	29	6	10	10	74		30	9	124	1.14	237.2

T		Species, Sort Grade - Board Foot Volumes (Type)														Page		1				
TSPCSTGR		Project: PIEDP														Date		2/22/2018				
																Time		3:11:38PM				
T04N R07W S07 TTK										T04N R07W S07 TTK												
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt													
04N	07W	07	A1	TK	51.00	34	72	1	W													
S So Gr T rt ad Spp			%	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre		
			Net BdFt					Log Scale Dia.				Log Length				Ln	Dia	Bd	CF/ Lf			
										4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft		
D	DO	CU																9	15		0.00	5.3
D	DO	2S	73	.5	15,914	15,835	808					39	61	0		13	87	38	16	426	2.46	37.2
D	DO	3S	20	.3	4,331	4,319	220			98	2			5	10	24	61	35	9	95	0.90	45.6
D	DO	4S	7		1,503	1,503	77			100				68	32			20	6	27	0.43	56.7
D Totals			75	.4	21,748	21,658	1,105			26	29	45		6	4	14	76	29	10	150	1.30	144.8
H	DO	CU																10	15		0.00	6.8
H	DO	2S	62	.5	2,462	2,451	125					23	77	18		25	57	29	16	317	2.52	7.7
H	DO	3S	32		1,291	1,291	66			100				2	8	42	48	33	8	94	1.01	13.8
H	DO	4S	6		200	200	10			100				66	34			20	7	28	0.60	7.1
H Totals			14	.3	3,953	3,942	201			38	14	48		15	4	29	51	25	11	111	1.25	35.4
A	DO	CU																12	18		0.00	1.2
A	DO	1S	23		765	765	39					100			61		39	34	13	188	1.55	4.1
A	DO	2S	26		815	815	42			64	36						100	40	11	198	1.53	4.1
A	DO	3S	20		642	642	33			56	44					44	56	38	11	158	1.14	4.1
A	DO	4S	31		980	980	50			100				36	7		57	28	6	41	0.59	24.1
A Totals			11		3,202	3,202	163			58	42			11	17	9	63	30	8	85	0.90	37.5
Type Totals				.4	28,904	28,802	1,469			32	28	40		8	6	16	71	29	10	132	1.22	217.7

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page 1									
		Project: PIEDP												Date 2/22/2018									
														Time 3:11:56PM									
T04N R07W S07 TTK										T04N R07W S07 TTK													
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt														
04N	07W	07	A23	TK	127.00	76	185	1	W														
S So Gr T rt ad Spp			% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre				
								Log Scale Dia.				Log Length				Ln	Dia	Bd		CF/ Lf			
										4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft	Lf		
A	DO	CU																8	17		0.00	1.8	
A	DO	1S	26		3,740	3,740	475					89	11		6	10	83	38	14	273	1.86	13.7	
A	DO	2S	32	.5	4,434	4,411	560			45	55				26	6	68	36	12	173	1.33	25.5	
A	DO	3S	19	.7	2,624	2,605	331			95	5			1	13	9	77	36	10	125	0.98	20.9	
A	DO	4S	23		3,214	3,214	408			100				29	31	6	34	26	7	40	0.59	79.8	
A	Totals		47	.3	14,012	13,970	1,774			55	42	3		7	19	8	66	30	9	99	0.97	141.6	
D	DO	CU																5	17		0.00	.9	
D	DO	2S	72	.6	8,101	8,054	1,023					37	63		0	0	3	96	39	17	457	2.49	17.6
D	DO	3S	24	.8	2,602	2,582	328			64	12	24		3	4	14	79	36	9	124	0.98	20.9	
D	DO	4S	4	3.4	434	419	53			100				53	40	7		21	6	29	0.50	14.5	
D	Totals		37	.7	11,136	11,056	1,404			19	30	51		3	3	6	88	33	11	205	1.49	53.9	
H	DO	CU																30	24		0.00	.3	
H	DO	2S	66	.9	1,688	1,673	212					59	41				100	40	16	418	2.39	4.0	
H	DO	3S	23		593	593	75			100				9	10	31	50	34	8	81	0.86	7.3	
H	DO	4S	11	13.2	299	260	33			100				66	34			19	7	22	0.47	11.6	
H	Totals		8	2.1	2,580	2,525	320 321			34	39	27		9	6	7	78	27	9	109	1.10	23.3	
M	DO	CU																4	15		0.00	1.8	
M	DO	2S	15		100	100	13					100			100			30	13	180	1.70	.6	
M	DO	3S	23		151	151	19			100					66		34	32	10	118	1.29	1.3	
M	DO	4S	62	2.4	418	408	52			100				10	29	10	51	31	7	52	0.81	7.9	
M	Totals		2	1.5	670	660	84			85	15			6	49	6	39	27	9	57	0.91	11.5	
S	DO	2S	15		152	152	19					100			100			32	13	190	1.59	.8	
S	DO	3S	56	.9	549	544	69			8			92				100	40	14	421	3.04	1.3	
S	DO	4S	29		276	276	35			100					16		84	35	6	55	0.61	5.0	
S	Totals		3	.5	977	972	123			33	16	51			4	16	80	35	8	137	1.21	7.1	
C	DO	3S	89		508	508	65			100						67	33	35	9	108	1.25	4.7	
C	DO	4S	11		57	57	7			100				100				18	6	20	0.44	2.8	
C	Totals		2		565	565	72			100				10		60	30	29	8	75	1.06	7.5	
Type Totals					.6	29,940	29,747	3,778		41	35	25		5	12	8	74	30	9	121	1.11	244.9	

T	Species, Sort Grade - Board Foot Volumes (Type)										Page 1											
	Project: PIEDP										Date	2/22/2018										
											Time	3:12:11PM										
T04N R07W S07 TTK										T04N R07W S07 TTK												
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt													
04N	07W	07	R/W	TK	2.00	76	185	1	W													
S So Gr Spp T rt ad			% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre			
								Log Scale Dia.				Log Length				Ln	Dia	Bd		CF/ Lf		
										4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft		
A	DO	CU																8	17		0.00	1.8
A	DO	1S	26		3,740	3,740	7					89	11		6	10	83	38	14	273	1.86	13.7
A	DO	2S	32	.5	4,434	4,411	9			45	55				26	6	68	36	12	173	1.33	25.5
A	DO	3S	19	.7	2,624	2,605	5			95	5			1	13	9	77	36	10	125	0.98	20.9
A	DO	4S	23		3,214	3,214	6			100				29	31	6	34	26	7	40	0.59	79.8
A Totals			47	.3	14,012	13,970	28			55	42	3		7	19	8	66	30	9	99	0.97	141.6
D	DO	CU																5	17		0.00	.9
D	DO	2S	72	.6	8,101	8,054	16					37	63	0	0	3	96	39	17	457	2.49	17.6
D	DO	3S	24	.8	2,602	2,582	5			64	12	24		3	4	14	79	36	9	124	0.98	20.9
D	DO	4S	4	3.4	434	419	1			100				53	40	7		21	6	29	0.50	14.5
D Totals			37	.7	11,136	11,056	22			19	30	51		3	3	6	88	33	11	205	1.49	53.9
H	DO	CU																30	24		0.00	.3
H	DO	2S	66	.9	1,688	1,673	3					59	41				100	40	16	418	2.39	4.0
H	DO	3S	23		593	593	1			100				9	10	31	50	34	8	81	0.86	7.3
H	DO	4S	11	13.2	299	260	1			100				66	34			19	7	22	0.47	11.6
H Totals			8	2.1	2,580	2,525	5			34	39	27		9	6	7	78	27	9	109	1.10	23.3
M	DO	CU																4	15		0.00	1.8
M	DO	2S	15		100	100	0					100			100			30	13	180	1.70	.6
M	DO	3S	23		151	151	0			100					66		34	32	10	118	1.29	1.3
M	DO	4S	62	2.4	418	408	1			100				10	29	10	51	31	7	52	0.81	7.9
M Totals			2	1.5	670	660	1			85	15			6	49	6	39	27	9	57	0.91	11.5
S	DO	2S	15		152	152	0					100			100			32	13	190	1.59	.8
S	DO	3S	56	.9	549	544	1			8		92					100	40	14	421	3.04	1.3
S	DO	4S	29		276	276	1			100					16		84	35	6	55	0.61	5.0
S Totals			3	.5	977	972	2			33	16	51			4	16	80	35	8	137	1.21	7.1
C	DO	3S	89		508	508	1			100					67	33		35	9	108	1.25	4.7
C	DO	4S	11		57	57	0			100				100				18	6	20	0.44	2.8
C Totals			2		565	565	1			100				10		60	30	29	8	75	1.06	7.5
Type Totals					.6	29,940	29,747	59		41	35	25		5	12	8	74	30	9	121	1.11	244.9

TC PSTATS			PROJECT STATISTICS					PAGE 1				
			PROJECT		PIEDP		DATE 2/22/2018					
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
04N	07	07	A1	TK		180.00	186	1,192	1	W		
04N	07W	07	A23	TK								
04N	07W	07	R/W	TK								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			186	1192	6.4							
CRUISE			69	442	6.4	25,106	1.8					
DBH COUNT												
REFOREST												
COUNT			117	750	6.4							
BLANKS												
100 %												
STAND SUMMARY												
			SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
R ALDER			212	66.2	16.4	54	24.1	97.5	10,949	10,919	3,268	3,268
DOUG FIR			149	41.8	19.4	62	19.4	85.4	14,143	14,060	3,412	3,412
WHEMLOCK			41	17.1	17.0	43	6.5	26.9	2,969	2,927	814	814
BL MAPLE			24	6.9	16.7	37	2.6	10.5	480	473	200	200
S SPRUCE			12	4.2	17.3	45	1.6	6.8	700	697	218	218
WR CEDAR			4	3.4	18.7	49	1.5	6.4	405	405	165	165
TOTAL			442	139.5	17.5	54	55.8	233.4	29,646	29,479	8,077	8,077
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL	68.1	COEFF		SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH			5	10	15	
R ALDER		60.3	4.1	203	212	221						
DOUG FIR		80.0	6.5	674	721	769						
WHEMLOCK		99.3	15.5	287	340	392						
BL MAPLE		71.4	14.9	66	78	89						
S SPRUCE		141.2	42.5	289	503	717						
WR CEDAR		25.1	14.3	99	115	131						
TOTAL		113.6	5.4	374	395	417			515	129	57	
CL	68.1	COEFF		TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH			5	10	15	
R ALDER		166.3	12.2	58	66	74						
DOUG FIR		200.2	14.7	36	42	48						
WHEMLOCK		234.7	17.2	14	17	20						
BL MAPLE		367.3	26.9	5	7	9						
S SPRUCE		493.2	36.1	3	4	6						
WR CEDAR		545.8	40.0	2	3	5						
TOTAL		109.2	8.0	128	139	151			476	119	53	
CL	68.1	COEFF		BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH			5	10	15	
R ALDER		154.3	11.3	86	97	108						
DOUG FIR		158.9	11.6	75	85	95						
WHEMLOCK		219.7	16.1	23	27	31						
BL MAPLE		367.1	26.9	8	10	13						
S SPRUCE		437.5	32.0	5	7	9						
WR CEDAR		545.3	39.9	4	6	9						
TOTAL		98.0	7.2	217	233	250			383	96	43	
CL	68.1	COEFF		NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH			5	10	15	
R ALDER		153.6	11.3	9,690	10,919	12,148						
DOUG FIR		159.6	11.7	12,416	14,060	15,703						
WHEMLOCK		219.9	16.1	2,455	2,927	3,398						

TC PSTATS			PROJECT STATISTICS					PAGE	2	
			PROJECT PIEDP					DATE	2/22/2018	
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
04N	07	07	A1	TK		180.00	186	1,192	1	W
04N	07W	07	A23	TK						
04N	07W	07	R/W	TK						
CL	68.1		COEFF	NET BF/ACRE				# OF PLOTS REQ.	INF. POP.	
SD:	1.00		VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
BL MAPLE			387.5	28.4	339	473	607			
S SPRUCE			441.2	32.3	472	697	922			
WR CEDAR			547.2	40.1	242	405	567			
TOTAL			100.4	7.4	27,312	29,479	31,647	402	101	45

TC TSTATS				STATISTICS			PAGE 1			
				PROJECT	PIEDP	DATE 2/22/2018				
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
04N	07W	07	A1	00MC	51.00	34	190	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL		34	190	5.6						
CRUISE		15	72	4.8	6,333	1.1				
DBH COUNT										
REFOREST										
COUNT		19	118	6.2						
BLANKS										
100 %										
STAND SUMMARY										
		SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS
		TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC
DOUG FIR		45	81.6	18.2	54	34.7	148.2	21,748	21,658	5,427
WHEMLOCK		15	17.2	20.0	53	8.4	37.6	3,953	3,942	1,103
R ALDER		12	25.3	16.0	47	8.8	35.3	3,202	3,202	1,034
TOTAL		72	124.2	18.1	52	52.0	221.2	28,904	28,802	7,564
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL:	68.1 %	COEFF		SAMPLE TREES - BF			# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5	10	15	
DOUG FIR		88.1	13.1	471	543	614				
WHEMLOCK		90.6	24.2	249	329	408				
R ALDER		56.0	16.9	132	158	185				
TOTAL		98.5	11.6	384	434	484	388	97	43	
CL:	68.1 %	COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5	10	15	
DOUG FIR		99.8	17.1	68	82	96				
WHEMLOCK		150.9	25.9	13	17	22				
R ALDER		176.7	30.3	18	25	33				
TOTAL		68.7	11.8	110	124	139	188	47	21	
CL:	68.1 %	COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5	10	15	
DOUG FIR		57.0	9.8	134	148	163				
WHEMLOCK		143.1	24.5	28	38	47				
R ALDER		171.5	29.4	25	35	46				
TOTAL		46.1	7.9	204	221	239	85	21	9	
CL:	68.1 %	COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR. %	S.E. %	LOW	AVG	HIGH	5	10	15	
DOUG FIR		54.5	9.3	19,636	21,658	23,679				
WHEMLOCK		142.5	24.4	2,979	3,942	4,904				
R ALDER		170.4	29.2	2,267	3,202	4,137				
TOTAL		46.4	8.0	26,511	28,802	31,092	86	21	10	

TC TSTATS				STATISTICS			PAGE 1				
				PROJECT PIEDP			DATE 2/22/2018				
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
04N	07W	07	A1	TK	51.00	34	188	1	W		
				TREES	ESTIMATED TOTAL	PERCENT SAMPLE					
				PER PLOT	TREES	TREES					
PLOTS		TREES									
TOTAL		34		188		5.5					
CRUISE		15		72		4.8		6,333			
DBH COUNT								1.1			
REFOREST											
COUNT		19		116		6.1					
BLANKS											
100 %											
STAND SUMMARY											
SAMPLE TREES		TREES /ACRE		AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR		45		81.6	18.2	54	34.7	148.2	21,748	21,658	5,427
WHEMLOCK		15		17.2	20.0	53	8.4	37.6	3,953	3,942	1,103
R ALDER		12		25.3	16.0	47	8.8	35.3	3,202	3,202	1,034
TOTAL		72		124.2	18.1	52	52.0	221.2	28,904	28,802	7,564
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL: 68.1 %		COEFF		SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		88.1		13.1	471	543	614				
WHEMLOCK		90.6		24.2	249	329	408				
R ALDER		56.0		16.9	132	158	185				
TOTAL		98.5		11.6	384	434	484	388	97	43	
CL: 68.1 %		COEFF		TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		99.8		17.1	68	82	96				
WHEMLOCK		150.9		25.9	13	17	22				
R ALDER		176.7		30.3	18	25	33				
TOTAL		68.7		11.8	110	124	139	188	47	21	
CL: 68.1 %		COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		57.0		9.8	134	148	163				
WHEMLOCK		143.1		24.5	28	38	47				
R ALDER		171.5		29.4	25	35	46				
TOTAL		46.1		7.9	204	221	239	85	21	9	
CL: 68.1 %		COEFF		NET BF/ACRE				# OF PLOTS REQ.		INF. POP.	
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		54.5		9.3	19,636	21,658	23,679				
WHEMLOCK		142.5		24.4	2,979	3,942	4,904				
R ALDER		170.4		29.2	2,267	3,202	4,137				
TOTAL		46.4		8.0	26,511	28,802	31,092	86	21	10	

TC TSTATS				STATISTICS				PAGE 1		
				PROJECT	PIEDP					DATE 2/22/2018
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
04N	07W	07	A23	00MC	127.00	76	520	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL	76	520	6.8							
CRUISE	27	193	7.1		18,790		1.0			
DBH COUNT										
REFOREST										
COUNT	49	325	6.6							
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
R ALDER	100	82.4	16.5	55	30.1	122.1	14,012	13,970	4,152	4,152
DOUG FIR	51	26.0	20.6	71	13.2	60.0	11,256	11,174	2,644	2,644
WHEMLOCK	13	17.0	15.6	39	5.7	22.6	2,580	2,525	699	699
BL MAPLE	12	9.6	16.7	37	3.6	14.6	670	660	280	280
SNAG	9	2.5	27.2	40	1.9	10.0				
S SPRUCE	6	5.8	17.3	45	2.3	9.5	977	972	304	304
WR CEDAR	2	4.7	18.7	49	2.1	8.9	565	565	230	230
TOTAL	193	148.0	17.5	54	59.2	247.7	30,059	29,866	8,309	8,309
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
R ALDER	60.2	6.0	202	215	228					
DOUG FIR	73.6	10.3	731	814	898					
WHEMLOCK	107.3	30.9	239	346	453					
BL MAPLE	73.0	22.0	60	78	95					
SNAG										
S SPRUCE	148.1	65.9	171	503	835					
WR CEDAR	30.7	28.8	82	115	148					
TOTAL	121.3	8.7	339	372	404		588	147	65	
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
R ALDER	92.9	10.6	74	82	91					
DOUG FIR	162.7	18.6	21	26	31					
WHEMLOCK	179.2	20.5	14	17	21					
BL MAPLE	226.8	26.0	7	10	12					
SNAG	289.1	33.1	2	2	3					
S SPRUCE	312.2	35.8	4	6	8					
WR CEDAR	347.4	39.8	3	5	7					
TOTAL	51.0	5.8	139	148	157		104	26	12	
CL: 68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
R ALDER	80.9	9.3	111	122	133					
DOUG FIR	140.1	16.1	50	60	70					
WHEMLOCK	166.6	19.1	18	23	27					
BL MAPLE	226.7	26.0	11	15	18					
SNAG	278.1	31.9	7	10	13					
S SPRUCE	274.7	31.5	6	9	12					
WR CEDAR	347.0	39.8	5	9	13					
TOTAL	40.6	4.7	236	248	259		66	16	7	
CL: 68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	

TC TSTATS				STATISTICS			PAGE	2	
				PROJECT	PIEDP	DATE		2/22/2018	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	07	A23	00MC	127.00	76	520	1	W
CL:	68.1 %	COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
R ALDER		78.3	9.0	12,715	13,970	15,224			
DOUG FIR		139.0	15.9	9,395	11,174	12,954			
WHEMLOCK		168.3	19.3	2,038	2,525	3,013			
BL MAPLE		240.6	27.6	478	660	842			
SNAG									
S SPRUCE		277.2	31.8	663	972	1,281			
WR CEDAR		348.3	39.9	339	565	790			
TOTAL		45.7	5.2	28,300	29,866	31,432	84	21	9

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	PIEDP	DATE 2/22/2018					
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
04N	07W	07	A23	TK	127.00	76	502	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
				PLOTS	TREES	TREES	TREES				
TOTAL				76	502	6.6					
CRUISE				27	185	6.9	18,483	1.0			
DBH COUNT											
REFOREST											
COUNT				49	317	6.5					
BLANKS											
100 %											
STAND SUMMARY											
SAMPLE		TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET	
TREES		/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC	
R ALDER		100	82.4	16.5	55	30.1	122.1	14,012	13,970	4,152	4,152
DOUG FIR		52	26.0	20.7	71	13.3	60.5	11,136	11,056	2,616	2,616
WHEMLOCK		13	17.0	15.6	39	5.7	22.6	2,580	2,525	699	699
BL MAPLE		12	9.6	16.7	37	3.6	14.6	670	660	280	280
S SPRUCE		6	5.8	17.3	45	2.3	9.5	977	972	304	304
WR CEDAR		2	4.7	18.7	49	2.1	8.9	565	565	230	230
TOTAL		185	145.5	17.3	54	57.2	238.2	29,940	29,747	8,280	8,280
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL:	68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		60.2	6.0	202	215	228					
DOUG FIR		75.6	10.5	715	799	882					
WHEMLOCK		107.3	30.9	239	346	453					
BL MAPLE		73.0	22.0	60	78	95					
S SPRUCE		148.1	65.9	171	503	835					
WR CEDAR		30.7	28.8	82	115	148					
TOTAL		117.1	8.6	354	388	421	547	137	61		
CL:	68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		92.9	10.6	74	82	91					
DOUG FIR		161.6	18.5	21	26	31					
WHEMLOCK		179.2	20.5	14	17	21					
BL MAPLE		226.8	26.0	7	10	12					
S SPRUCE		312.2	35.8	4	6	8					
WR CEDAR		347.4	39.8	3	5	7					
TOTAL		51.8	5.9	137	146	154	107	27	12		
CL:	68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		80.9	9.3	111	122	133					
DOUG FIR		138.4	15.9	51	61	70					
WHEMLOCK		166.6	19.1	18	23	27					
BL MAPLE		226.7	26.0	11	15	18					
S SPRUCE		274.7	31.5	6	9	12					
WR CEDAR		347.0	39.8	5	9	13					
TOTAL		40.9	4.7	227	238	249	67	17	7		
CL:	68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		78.3	9.0	12,715	13,970	15,224					
DOUG FIR		139.1	15.9	9,294	11,056	12,818					
WHEMLOCK		168.3	19.3	2,038	2,525	3,013					
BL MAPLE		240.6	27.6	478	660	842					

TC TSTATS				STATISTICS				PAGE	2
				PROJECT	PIEDP				
								DATE	2/22/2018
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	07	A23	TK	127.00	76	502	1	W
CL: 68.1 %				COEFF			# OF PLOTS REQ.		INF. POP.
SD: 1.0				VAR. S.E.%			5 10		15
				NET BF/ACRE					
				LOW	AVG	HIGH			
S SPRUCE		277.2	31.8	663	972	1,281			
WR CEDAR		348.3	39.9	339	565	790			
TOTAL		45.6	5.2	28,194	29,747	31,300	83	21	9

TC TSTATS				STATISTICS				PAGE 1		
				PROJECT		PIEDP		DATE 2/22/2018		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
04N	07W	07	R/W	TK	2.00	76	502	1	W	
				TREES	ESTIMATED					
				PER PLOT	TOTAL	PERCENT				
					TREES	SAMPLE				
						TREES				
TOTAL		76	502	6.6						
CRUISE		27	185	6.9	291	63.6				
DBH COUNT										
REFOREST										
COUNT		49	317	6.5						
BLANKS										
100 %										
STAND SUMMARY										
SAMPLE		TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
TREES		/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
R ALDER		100	82.4	16.5	55	30.1	122.1	14,012	13,970	4,152
DOUG FIR		52	26.0	20.7	71	13.3	60.5	11,136	11,056	2,616
WHEMLOCK		13	17.0	15.6	39	5.7	22.6	2,580	2,525	699
BL MAPLE		12	9.6	16.7	37	3.6	14.6	670	660	280
S SPRUCE		6	5.8	17.3	45	2.3	9.5	977	972	304
WR CEDAR		2	4.7	18.7	49	2.1	8.9	565	565	230
TOTAL		185	145.5	17.3	54	57.2	238.2	29,940	29,747	8,280
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		60.2	6.0	202	215	228				
DOUG FIR		75.6	10.5	715	799	882				
WHEMLOCK		107.3	30.9	239	346	453				
BL MAPLE		73.0	22.0	60	78	95				
S SPRUCE		148.1	65.9	171	503	835				
WR CEDAR		30.7	28.8	82	115	148				
TOTAL		117.1	8.6	354	388	421	547	137	61	
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		92.9	10.6	74	82	91				
DOUG FIR		161.6	18.5	21	26	31				
WHEMLOCK		179.2	20.5	14	17	21				
BL MAPLE		226.8	26.0	7	10	12				
S SPRUCE		312.2	35.8	4	6	8				
WR CEDAR		347.4	39.8	3	5	7				
TOTAL		51.8	5.9	137	146	154	107	27	12	
CL: 68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		80.9	9.3	111	122	133				
DOUG FIR		138.4	15.9	51	61	70				
WHEMLOCK		166.6	19.1	18	23	27				
BL MAPLE		226.7	26.0	11	15	18				
S SPRUCE		274.7	31.5	6	9	12				
WR CEDAR		347.0	39.8	5	9	13				
TOTAL		40.9	4.7	227	238	249	67	17	7	
CL: 68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
R ALDER		78.3	9.0	12,715	13,970	15,224				
DOUG FIR		139.1	15.9	9,294	11,056	12,818				
WHEMLOCK		168.3	19.3	2,038	2,525	3,013				
BL MAPLE		240.6	27.6	478	660	842				

TC TSTATS				STATISTICS				PAGE	2
				PROJECT		PIEDP		DATE	2/22/2018
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
04N	07W	07	R/W	TK	2.00	76	502	1	W
CL: 68.1 %				NET BF/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0				LOW	AVG	HIGH	5	10	15
S SPRUCE		277.2	31.8	663	972	1,281			
WR CEDAR		348.3	39.9	339	565	790			
TOTAL		45.6	5.2	28,194	29,747	31,300	83	21	9

TC PLOGSTVB				Log Stock Table - MBF																
T04N R07W S07 TyTK				51.00		Project: PIEDP										Page 1				
T04N R07W S07 TyTK				127.00		Acres 180.00										Date 2/22/2018				
T04N R07W S07 TyTK				2.00												Time 3:22:53PM				
Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches												
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+	
H		DO 2S	16	7		7	1.4							7						
H		DO 2S	18	15		15	2.9						4		11					
H		DO 2S	32	32	1.8	32	6.0						17		15					
H		DO 2S	38	18		18	3.5								18					
H		DO 2S	40	270		268	50.9							103	103	62				
H		DO 3S	16	4		4	.8			2		3								
H		DO 3S	20	4		4	.8					4								
H		DO 3S	28	4		4	.7					4								
H		DO 3S	30	9		9	1.7			3	6									
H		DO 3S	32	39		39	7.5			5		34								
H		DO 3S	34	12		12	2.3			12										
H		DO 3S	40	70		70	13.2			17	3	49								
H		DO 4S	12	10	50.0	5	1.0			5										
H		DO 4S	16	6		6	1.1			5	1									
H		DO 4S	18	2		2	.3			2										
H		DO 4S	20	16		16	3.1			13		3								
H		DO 4S	26	2		2	.3				2									
H		DO 4S	28	2		2	.3			2										
H		DO 4S	30	11		11	2.2			11										
H		Totals		534	1.4	527	9.9			77	15	93	21	110	147	62				
D		DO 2S	16	4		4	.1						4							
D		DO 2S	28	4		4	.2							4						
D		DO 2S	32	115		114	4.5						27	34	36	17				
D		DO 2S	34	23		23	.9										23			
D		DO 2S	38	29		29	1.2						18		12					
D		DO 2S	40	1,682		1,673	66.1						137	327	546	456	207			
D		DO 3S	16	5		5	.2					5								
D		DO 3S	18	2		2	.1					2								
D		DO 3S	20	13		13	.5				2	7	5							
D		DO 3S	24	5		5	.2				2	3								
D		DO 3S	26	4		4	.2				4									
D		DO 3S	28	13		13	.5				9	3								
D		DO 3S	30	14		14	.6			3	5	5								
D		DO 3S	32	101		100	4.0			3	60	30	7							
D		DO 3S	36	8		8	.3				8									
D		DO 3S	38	8		8	.3					8								

TC PLOGSTVB			Log Stock Table - MBF																
T04N R07W S07 TyTK51.00 T04N R07W S07 TyTK127.00 T04N R07W S07 TyTK2.00				Project: PIEDP										Page 2					
				Acres 180.00										Date 2/22/2018					
														Time 3:22:53PM					
S T Spp	So Gr rt	Log de Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches												
							2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+	
D	DO	3S	40	383		380	15.0			84	96	87	15	32	21	45			
D	DO	4S	14	3		3	.1			2		1							
D	DO	4S	16	36		36	1.4			35	1								
D	DO	4S	18	17		17	.7			10	6								
D	DO	4S	20	25		25	1.0			17	4	4							
D	DO	4S	24	18		18	.7			18									
D	DO	4S	26	9		9	.3			9									
D	DO	4S	28	10		10	.4			10									
D	DO	4S	30	11	17.5	9	.4			6		3							
D	DO	4S	34	4		4	.2			4									
D	Totals			2,546		2,531	47.7			201	199	159	197	379	626	495	275		
A	DO	1S	30	55		55	2.8					9	46						
A	DO	1S	34	50		50	2.5					17	33						
A	DO	1S	36	34		34	1.7					18	16						
A	DO	1S	38	106		106	5.4					50	36	19					
A	DO	1S	40	277		277	14.1					106	97	54	20				
A	DO	2S	26	30	3.0	29	1.5					13		16					
A	DO	2S	28	14		14	.7					14							
A	DO	2S	30	104		104	5.3					42	57	6					
A	DO	2S	34	33		33	1.7					33							
A	DO	2S	36	13		13	.7						13						
A	DO	2S	38	140	1.6	138	7.0					68	37	32					
A	DO	2S	40	279		279	14.2					142	87	50					
A	DO	3S	16	2		2	.1				2								
A	DO	3S	26	3		3	.1				3								
A	DO	3S	28	15		15	.8				2	13							
A	DO	3S	30	25		25	1.3				7			18					
A	DO	3S	34	46		46	2.3				17	15	14						
A	DO	3S	36	82	1.4	81	4.1				17	64							
A	DO	3S	38	19		19	1.0				19								
A	DO	3S	40	180		178	9.1				65	113							
A	DO	4S	16	42		42	2.1			40	2								
A	DO	4S	18	48		48	2.4			46		2							
A	DO	4S	20	49		49	2.5			30	16	2							
A	DO	4S	26	19		19	1.0			19									
A	DO	4S	28	33		33	1.7			33									

Log Stock Table - MBF

T04N R07W S07 TyTK	51.00
T04N R07W S07 TyTK	127.00
T04N R07W S07 TyTK	2.00

Project: **PIEDP**
 Acres **180.00**

Page **3**
 Date **2/22/2018**
 Time **3:22:53PM**

S Spp	T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+
A		DO	4S 30	79		79	4.0			76	3								
A		DO	4S 34	26		26	1.3			26									
A		DO	4S 36	14		14	.7			9	5								
A		DO	4S 38	10		10	.5			10									
A		DO	4S 40	144		144	7.3			132	12								
A		Totals		1,971		1,965	37.0			423	169	494	436	333	89	20			
S		DO	2S 32	20		20	15.7					20							
S		DO	3S 40	71		70	56.0			6				34		31			
S		DO	4S 24	2		2	2.0				2								
S		DO	4S 26	3		3	2.5			3									
S		DO	4S 36	19		19	14.8			19									
S		DO	4S 40	11		11	9.1			11									
S		Totals		126		125	2.4			39	2	20		34		31			
M		DO	2S 30	13		13	15.2					13							
M		DO	3S 30	13		13	15.2					13							
M		DO	3S 36	7		7	7.7				7								
M		DO	4S 18	5		5	6.0			5									
M		DO	4S 26	7		7	8.0			7									
M		DO	4S 28	6	20.0	5	6.0			5									
M		DO	4S 30	4		4	4.2			4									
M		DO	4S 34	5		5	6.3			5									
M		DO	4S 38	21		21	24.8			21									
M		DO	4S 40	6		6	6.6			6									
M		Totals		86	1.5	85	1.6			53	7	13	13						
C		DO	3S 32	44		44	60.3					44							
C		DO	3S 40	22		22	29.6				22								
C		DO	4S 18	7		7	10.1			7									
C		Totals		73		73	1.4			7	22	44							
Total		All Species		5,336		5,306	100.0			800	414	804	687	822	896	577	305		

TC		PSTNDSUM		Stand Table Summary										Page		1	
														Date:		3/21/2018	
T04N R07W S07 TyTK51.00 T04N R07W S07 TyTK127.00				Project						PIEDP		Time:		3:20:01PM			
				Acres						178.00		Grown Year:					
S Spec	T	Sample		Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals			
		DBH	Trees	FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF	
D		9	2	85	21	4.273	1.89	4.27	5.0	20.0		21	85		38	15	
D		10	2	85	43	3.461	1.89	3.46	9.0	30.0		31	104		55	18	
D		11	2	81	67	2.517	1.66	2.52	16.5	45.0		42	113		74	20	
D		12	3	84	80	3.172	2.49	5.29	13.4	42.0		71	222		126	40	
D		13	3	83	70	2.826	2.60	3.85	18.1	52.0		70	200		124	36	
D		14	3	86	73	2.543	2.72	4.20	18.0	56.1		76	236		135	42	
D		15	4	83	71	2.984	3.66	4.43	21.3	61.3		94	272		168	48	
D		16	2	87	85	1.352	1.89	2.70	23.5	80.0		64	216		113	39	
D		17	3	86	92	1.653	2.60	3.31	27.2	91.6		90	303		160	54	
D		18	2	88	98	1.004	1.77	2.48	28.6	107.3		71	266		126	47	
D		19	2	85	78	.901	1.77	1.32	36.6	105.1		48	139		86	25	
D		20	1	89	115	.381	.83	1.14	33.3	133.3		38	152		68	27	
D		21	2	88	111	.785	1.89	1.96	42.2	166.0		83	326		147	58	
D		22	1	86	128	.358	.94	1.07	43.7	180.0		47	193		83	34	
D		23	7	87	116	2.172	6.27	5.86	47.5	192.5		279	1,128		496	201	
D		24	6	85	117	1.622	5.10	4.34	53.0	210.8		230	914		409	163	
D		25	7	86	117	1.838	6.27	3.99	59.2	234.8		236	936		420	167	
D		26	9	87	110	2.181	8.04	5.04	68.0	273.3		343	1,377		610	245	
D		27	2	85	94	.446	1.77	.86	75.4	321.0		65	277		116	49	
D		28	4	86	111	.883	3.78	2.21	72.7	305.0		160	673		286	120	
D		29	8	87	136	1.523	6.98	4.57	79.0	367.8		361	1,680		642	299	
D		30	2	87	130	.338	1.66	1.02	81.0	373.3		82	379		146	67	
D		31	4	87	118	.634	3.32	1.74	86.9	386.4		151	673		270	120	
D		32	3	85	135	.466	2.60	1.40	84.5	403.4		118	564		210	100	
D		33	3	88	136	.419	2.49	1.26	102.9	500.0		129	629		230	112	
D		34	3	85	120	.413	2.60	1.11	106.7	489.8		118	543		210	97	
D		35	3	88	131	.407	2.72	1.22	111.1	553.8		136	676		241	120	
D		38	1	85	125	.120	.94	.36	125.0	596.7		45	215		80	38	
D		39	2	86	124	.200	1.66	.50	157.0	752.0		79	376		140	67	
D		42	1	85	148	.086	.83	.26	169.7	870.0		44	225		78	40	
D		Totals	97	85	84	41.957	85.66	77.73	44.0	181.3		3,421	14,093		6,090	2,509	
A		9	2	87	24	3.942	1.74	3.94	6.0	25.0		24	99		42	18	
A		10	1	86	26	1.597	.87	1.60	8.0	30.0		13	48		23	9	
A		11	1	87	68	1.277	.84	1.28	19.0	60.0		24	77		43	14	
A		12	3	87	49	3.291	2.58	3.29	17.1	53.5		56	176		100	31	
A		13	4	87	87	3.779	3.48	6.61	20.0	68.6		132	453		235	81	
A		14	10	86	60	8.120	8.68	9.75	24.9	65.8		243	642		432	114	
A		15	13	86	71	9.202	11.29	16.28	23.1	76.5		376	1,245		669	222	
A		16	13	86	75	8.088	11.29	14.33	27.0	90.9		387	1,302		689	232	
A		17	13	86	81	7.164	11.29	14.88	28.4	99.3		423	1,477		753	263	
A		18	13	86	76	6.391	11.29	12.29	32.4	105.6		399	1,298		710	231	
A		19	7	87	82	3.082	6.07	6.16	37.4	124.4		231	766		411	136	
A		20	5	86	74	1.983	4.33	3.97	37.6	127.0		149	504		265	90	
A		21	6	86	85	2.149	5.17	4.31	42.8	152.0		184	655		328	117	
A		22	9	86	80	2.969	7.84	5.61	47.6	161.2		267	904		475	161	
A		23	4	86	78	1.198	3.46	2.40	52.4	181.4		126	435		223	77	
A		24	4	87	76	1.109	3.48	2.22	55.4	196.2		123	435		219	77	
A		26	1	87	84	.236	.87	.47	70.5	255.0		33	120		59	21	
A		30	1	87	85	.177	.87	.35	66.5	260.0		24	92		42	16	
A		32	1	86	37	.156	.87	.16	95.0	210.0		15	33		26	6	
A		33	1	87	74	.147	.87	.29	103.5	420.0		30	123		54	22	
A		Totals	112	86	69	66.056	97.20	110.18	29.6	98.8		3,259	10,885		5,800	1,937	

TC		PSTNDSUM		Stand Table Summary										Page		2	
														Date:		3/21/2018	
T04N R07W S07 TyTK51.00 T04N R07W S07 TyTK127.00				ProjectPIEDP										Time:		3:20:01PM	
				Acres178.00										Grown Year:			
S Spec	T	Sample		Tot					Average Log		Net		Net		Totals		
		DBH	Trees	FF	Av	Trees/	BA/	Logs	Net	Net	Tons/	Cu.Ft.	Bd.Ft.	Tons	Cunits	MBF	
				16'	Ht	Acre	Acre	Acre	Cu.Ft.	Bd.Ft.	Acre	Acre	Acre				
H		9	1	85	17	2.812	1.24	2.81	5.0	10.0		14	28		25	5	
H		10	1	89	28	2.277	1.24	2.28	8.0	20.0		18	46		32	8	
H		12	1	86	43	1.581	1.24	1.58	15.0	40.0		24	63		42	11	
H		13	1	86	47	1.348	1.24	1.35	19.0	50.0		26	67		46	12	
H		15	1	83	41	.586	.72	.59	24.0	50.0		14	29		25	5	
H		16	3	85	60	1.920	2.68	2.81	24.2	79.5		68	223		121	40	
H		17	2	87	70	.912	1.44	1.82	25.0	82.5		46	151		81	27	
H		19	2	85	68	.996	1.96	1.73	29.3	83.3		51	144		90	26	
H		20	3	88	78	1.229	2.68	2.13	41.2	136.6		88	291		156	52	
H		22	2	85	92	.743	1.96	1.68	42.5	159.4		72	268		127	48	
H		24	2	86	77	.624	1.96	1.25	51.4	199.5		64	249		114	44	
H		25	2	87	87	.575	1.96	1.15	65.4	231.5		75	266		134	47	
H		26	1	85	71	.195	.72	.39	61.5	240.0		24	94		43	17	
H		27	2	88	88	.493	1.96	1.17	65.1	265.8		76	310		135	55	
H		28	1	80	99	.168	.72	.34	88.5	310.0		30	104		53	19	
H		30	1	92	121	.253	1.24	.76	88.0	453.3		67	344		119	61	
H		31	1	89	112	.237	1.24	.47	62.5	265.0		30	126		53	22	
H		32	1	86	99	.129	.72	.26	119.0	495.0		31	127		55	23	
H		Totals	28	86	54	17.078	26.93	24.56	33.2	119.3		815	2,931		1,451	522	
S		11	1	85	63	1.707	1.13	1.71	18.0	60.0		31	102		55	18	
S		14	1	82	56	1.054	1.13	1.05	27.0	60.0		28	63		51	11	
S		19	1	88	71	.572	1.13	1.14	33.5	110.0		38	126		68	22	
S		21	1	81	48	.468	1.13	.47	56.0	70.0		26	33		47	6	
S		30	1	85	77	.229	1.13	.46	90.5	330.0		42	151		74	27	
S		43	1	82	107	.112	1.13	.22	230.0	975.0		51	218		91	39	
S		Totals	6	84	63	4.143	6.76	5.06	42.9	137.2		217	694		386	123	
M		13	1	86	35	.941	.87	.94	16.0	40.0		15	38		27	7	
M		14	1	87	45	.812	.87										
M		15	2	86	44	1.414	1.74	1.41	24.0	55.0		34	78		60	14	
M		16	1	86	49	.621	.87	.62	30.0	70.0		19	44		33	8	
M		17	1	86	63	.550	.87	1.10	23.5	80.0		26	88		46	16	
M		18	1	86	42	.491	.87	.49	32.0	60.0		16	29		28	5	
M		19	1	86	54	.441	.87	.44	41.0	70.0		18	31		32	5	
M		20	3	87	47	1.193	2.60	1.59	34.3	80.0		54	127		97	23	
M		21	1	87	47	.361	.87	.36	49.0	100.0		18	36		31	6	
M		Totals	12	86	46	6.825	10.41	6.96	28.7	67.6		199	471		355	84	
C		17	1	86	73	2.025	3.19	4.05	22.5	70.0		91	283		162	50	
C		21	1	82	57	1.327	3.19	1.33	55.0	90.0		73	119		130	21	
C		Totals	2	84	67	3.352	6.38	5.38	30.5	74.9		164	403		292	72	
Totals		257		86	70	139.411	233.34	229.86	35.1	128.2		8,075	29,476		14,374	5,247	

LOGGING PLAN

OF TIMBER SALE CONTRACT NO.
AT-341-2019-W00588-01

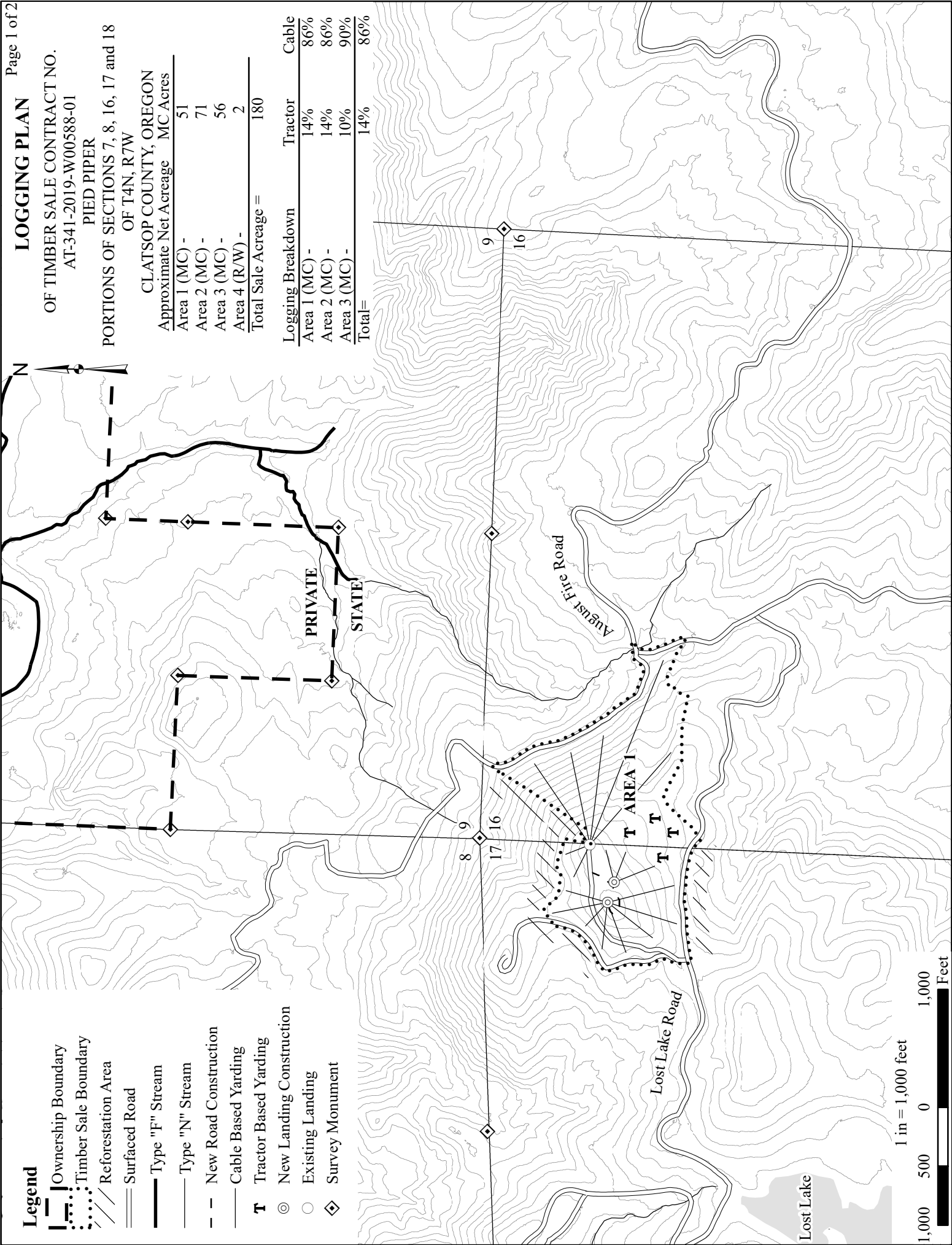
PIED PIPER

PORCTIONS OF SECTIONS 7, 8, 16, 17 and 18
OF T4N, R7W

CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres
Area 1 (MC) -	51
Area 2 (MC) -	71
Area 3 (MC) -	56
Area 4 (R/W) -	2
Total Sale Acreage =	180

Logging Breakdown	Tractor	Cable
Area 1 (MC) -	14%	86%
Area 2 (MC) -	14%	86%
Area 3 (MC) -	10%	90%
Total=	14%	86%



Legend

- Ownership Boundary
- Timber Sale Boundary
- Reforestation Area
- Surfaced Road
- Type "F" Stream
- Type "N" Stream
- New Road Construction
- Cable Based Yarding
- T Tractor Based Yarding
- ⊙ New Landing Construction
- Existing Landing
- ◆ Survey Monument

1 in = 1,000 feet



OF TIMBER SALE CONTRACT NO.
AT-341-2019-W00588-01
PIED PIPER
PORTIONS OF SECTIONS 7, 8, 16, 17 and 18
OF T4N, R7W

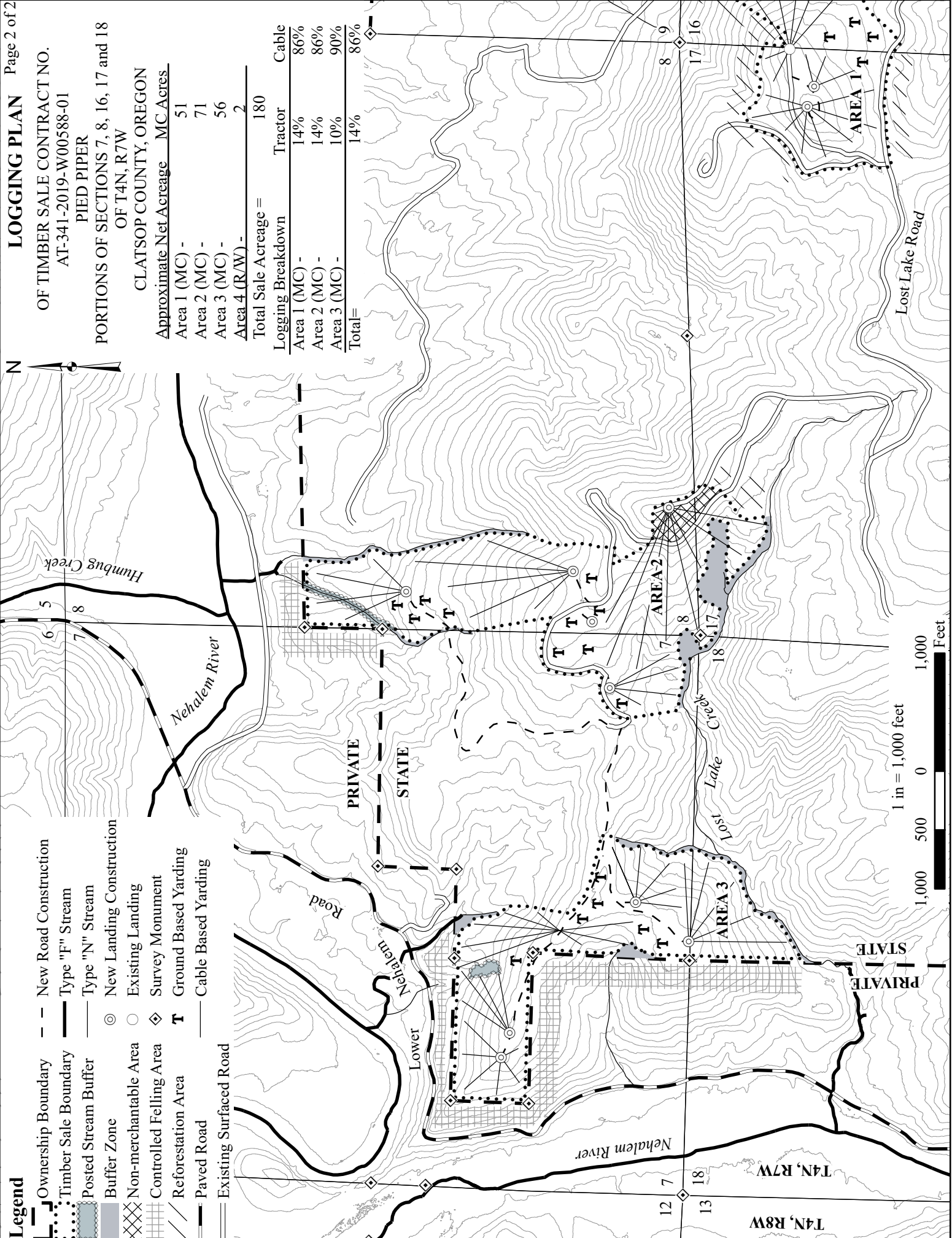
CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres
Area 1 (MC) -	51
Area 2 (MC) -	71
Area 3 (MC) -	56
Area 4 (RAW) -	2

Total Sale Acreage =		180
Logging Breakdown	Tractor	Cable
Area 1 (MC) -	14%	86%
Area 2 (MC) -	14%	86%
Area 3 (MC) -	10%	90%
Total=	14%	86%



- Legend**
- Ownership Boundary
 - Timber Sale Boundary
 - Posted Stream Buffer
 - Buffer Zone
 - Non-merchantable Area
 - Controlled Felling Area
 - Reforestation Area
 - Paved Road
 - Existing Surfaced Road
 - New Road Construction
 - Type "F" Stream
 - Type "N" Stream
 - New Landing Construction
 - Existing Landing
 - Survey Monument
 - Ground Based Yarding
 - Cable Based Yarding



1 in = 1,000 feet



Feet