"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

## cost summary

| | Conifer | Hardwood | Total |
|---|---|---|---|
| **Gross Timber Sale Value** | $4,339,366.08 | $103,356.24 | $4,442,722.32 |
| | | **Project Work:** | $(578,740.00) |
| | | **Advertised Value:** | $3,863,982.32 |

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

## timber description

**Location:** Portions of Sections 19, 30, 31, and 32, T6N, R6W, and portions of Section 36, T6N, R7W, and portions of Section 1, T5N, R7W, W.M., Clatsop County, Oregon.

**Stand Stocking:** 80%

| SpecieName | AvgDBH | Amortization (%) | Recovery (%) |
|---|---|---|---|
| Douglas - Fir | 20 | 0 | 97 |
| Western Hemlock / Fir | 16 | 0 | 97 |
| Alder (Red) | 14 | 0 | 95 |

| Volume by Grade | 2S | 3S | 4S 8" - 9' | Camprun | Total |
|---|---|---|---|---|---|
| Douglas - Fir | 7,618 | 1,742 | 288 | 0 | 9,648 |
| Western Hemlock / Fir | 174 | 81 | 25 | 0 | 280 |
| Alder (Red) | 0 | 0 | 0 | 314 | 314 |
| Total | 7,792 | 1,823 | 313 | 314 | 10,242 |

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

**comments:**

Pond Values Used: 4th Quarter Calendar Year 2013.

Expected Log Markets: Mist, OR; Clatskanie, OR; Tillamook, OR; Forest Grove, OR.

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
$896.06/MBF = $1,050/MBF - $153.94/MBF

Pulp (Conifer & Hardwood) Price = $30/MBF

SCALING COST ALLOWANCE = $5.00/MBF

FUEL COST ALLOWANCE = $4.00/Gallon

HAULING COST ALLOWANCE
Hauling costs equivalent to $780 daily truck cost.

Other Costs (with Profit & Risk to be added):
100% Branding and Painting: $1/MBF x 10,242 MBF = $10,242
Log Loader Slash & Landing Piling (includes Move-In and Pile Materials) = $16,788 (see attached appraisal)
Machine Washing for Noxious Weed Compliance = $2,000
TOTAL Other Costs (with Profit & Risk to be added) = $29,030

Other Costs (No Profit & Risk added):
Snag Creation:  66 snags x $40/snag = $2,640
Waterbar and Block Seasonal Road Segments after Harvest:
$35.00/station x 21.6 stations = $756
TOTAL Other Costs (No Profit & Risk added) = $3,396

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District: Astoria** **Date: March 17, 2014**

## logging conditions

**combination#: 1**

| | | | |
|---|---|---|---|
| | Douglas - Fir | 6.00% | |
| | Western Hemlock / Fir | 6.00% | |
| | Alder (Red) | 6.00% | |
| **yarding distance:** | Medium (800 ft) | **downhill yarding:** | No |
| **logging system:** | Cable: Medium Tower >40 - <70 | **Process**: | Manual Falling/Delimbing |
| **tree size:** | Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF | | |
| **loads / day:** | 10.0 | **bd. ft / load:** | 4,800 |
| **cost / mbf:** | $72.08 | | |

**machines:** Log Loader (A)
Tower Yarder (Medium)

**combination#: 2**

| | | | |
|---|---|---|---|
| | Douglas - Fir | 31.00% | |
| | Western Hemlock / Fir | 31.00% | |
| | Alder (Red) | 31.00% | |
| **yarding distance:** | Medium (800 ft) | **downhill yarding:** | No |
| **logging system:** | Shovel | **Process**: | Manual Falling/Delimbing |
| **tree size:** | Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF | | |
| **loads / day:** | 13.0 | **bd. ft / load:** | 4,800 |
| **cost / mbf:** | $40.14 | | |

**machines:** Shovel Logger

**combination#: 3**

| | | | |
|---|---|---|---|
| | Douglas - Fir | 41.00% | |
| | Western Hemlock / Fir | 41.00% | |
| | Alder (Red) | 41.00% | |
| **yarding distance:** | Medium (800 ft) | **downhill yarding:** | No |
| **logging system:** | Cable: Medium Tower >40 - <70 | **Process**: | Manual Falling/Delimbing |
| **tree size:** | Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF | | |
| **loads / day:** | 4.0 | **bd. ft / load:** | 3,700 |
| **cost / mbf:** | $233.79 | | |

**machines:** Log Loader (A)
Tower Yarder (Medium)

**combination#: 4**

| | | | |
|---|---|---|---|
| | Douglas - Fir | 22.00% | |
| | Western Hemlock / Fir | 22.00% | |
| | Alder (Red) | 22.00% | |
| **yarding distance:** | Short (400 ft) | **downhill yarding:** | No |
| **logging system:** | Shovel | **Process**: | Manual Falling/Delimbing |
| **tree size:** | Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF | | |
| **loads / day:** | 7.0 | **bd. ft / load:** | 4,500 |
| **cost / mbf:** | $79.51 | | |

**machines:** Shovel Logger

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

## logging costs

| | | | |
|---|---|---|---|
| **Operating Seasons:** | 3.00 | **Profit Risk:** | 12.00% |
| **Project Costs:** | $578,740.00 | **Other Costs (P/R):** | $29,030.00 |
| **Slash Disposal:** | $0.00 | **Other Costs:** | $3,396.00 |

**Miles of Road**

**Road Maintenance:** $2.71

| 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 | 3.0 | 4.5 |
| Western Hemlock / Fir | $0.00 | 2.0 | 4.0 |
| Alder (Red) | $0.00 | 2.0 | 3.5 |

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

## logging costs breakdown

| Logging | Road Maint | Fire Protect | Hauling | Other P/R appl | Profit & Risk | Slash Disposal | Scaling | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Douglas - Fir** | | | | | | | | | |
| $130.11 | $2.79 | $1.28 | $53.14 | $2.83 | $22.82 | $0.00 | $5.00 | $0.33 | $218.30 |
| **Western Hemlock / Fir** | | | | | | | | | |
| $130.11 | $2.79 | $1.28 | $89.66 | $2.83 | $27.20 | $0.00 | $5.00 | $0.33 | $259.20 |
| **Alder (Red)** | | | | | | | | | |
| $130.11 | $2.85 | $1.28 | $104.46 | $2.83 | $28.98 | $0.00 | $5.00 | $0.33 | $275.84 |

| Specie | Amortization | Pond Value | Stumpage | Amortized |
|---|---|---|---|---|
| Douglas - Fir | $0.00 | $660.91 | $442.61 | $0.00 |
| Western Hemlock / Fir | $0.00 | $505.86 | $246.66 | $0.00 |
| Alder (Red) | $0.00 | $605.00 | $329.16 | $0.00 |

"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal
# Mulaker
# Sale 341-14-34

**District:** **Astoria** **Date:** **March 17, 2014**

## summary

**Amortized**

| Specie | MBF | Value | Total |
|---|---|---|---|
| Douglas - Fir | 0 | $0.00 | $0.00 |
| Western Hemlock / Fir | 0 | $0.00 | $0.00 |
| Alder (Red) | 0 | $0.00 | $0.00 |

**Unamortized**

| Specie | MBF | Value | Total |
|---|---|---|---|
| Douglas - Fir | 9,648 | $442.61 | $4,270,301.28 |
| Western Hemlock / Fir | 280 | $246.66 | $69,064.80 |
| Alder (Red) | 314 | $329.16 | $103,356.24 |

**Gross Timber Sale Value**

**Recovery:** $4,442,722.32

**Prepared by:** Kevin Berry **Phone:** 503-325-5451

## Site Prep Appraisal

**Sale Number:** 341-14-34
**Sale Name:** Mulaker
**Date:** 01/21/2014

| 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 | 4.5 |
| Hemlock/Spruce | C | 2.0 | 6.0 |
| Hemlock | D | 2.0 | 6.0 |
| Conifer/Hardwood | E | 1.5 | 4.5 |

| Sale Area | Harvest Type | Veg Type/Zone | Ground Based Yarding Acres | Estimated Piling Hours/Area | Cost/Hour | Total Cost/Area |
|---|---|---|---|---|---|---|
| 1 | MC | B | 71 | 47 | $155.00 | $7,285.00 |
| 2 | MC | B | 34 | 22 | $155.00 | $3,410.00 |

**Sub Total =** *$10,695.00*

| 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 | 3 | $465.00 | $1,395.00 | 320 | $5.00 | $1,597.50 |
| 2 | 2 | $465.00 | $930.00 | 153 | $5.00 | $765.00 |

*Cost includes separating firewood

**Sub Total =** *$4,687.50*

| Move-In Allowance | Number of Move-In's | Total Move-In Allowance |
|---|---|---|
| $1,406.00 | 1 | $1,406.00 |

**Sub Total =** *$1,406.00*

**Grand Total =** **$16,788.50**

## SUMMARY OF ALL PROJECT COSTS

**SALE NAME:** Mulaker

**ROAD CONSTRUCTION:**

| | Road segment | Length/Sta | Cost | |
|---|---|---|---|---|
| Project No. 1 | A to B, C to D | 26.20 | | |
| | 2A to 2B | 24.75 | | |
| | 2C to 2D | 5.00 | | |
| | 3A to 3B | 10.70 | | |
| | 3C to 3D | 2.00 | $144,688 | |
| | 4F to 4G | 2.00 | | |
| | 4H to 4I | 1.00 | | |
| | 4J to 4K | 2.50 | | |
| | 5B to 5C | 2.50 | | |
| | **TOTALS** | 76.65 | | $144,688 |

**ROAD IMPROVEMENT:**

| | Road segment | Length/Sta | Cost | |
|---|---|---|---|---|
| Project No. 2 | I1 to I2, I3 to I4, I5 to I6, I7 to I8, I9 to I10, I11 to I12, I13 to I14, I15 to I16, I17 to I18, I23 to I24, I25 to I26 | 468.8 | $163,556 | |
| | I19 to I20, I21 to I22 | 34.7 | $65,233 | |
| | | | | |
| | | | | |
| | **TOTALS** | 503.50 | | $228,789 |

**SPECIAL PROJECTS:**

| | Description | Cost | |
|---|---|---|---|
| Project No. 3 | Northrup Quarry Development | $181,259 | |
| | and Rock Crushing | | |
| Project No. 4 | Road Vacating: V1, V2 to V3, V4 to V5, | $10,698 | |
| | V6 to V7 | | |
| | Project Road Maintenance | $4,193 | |
| | **TOTAL** | | $196,150 |

**MOVE IN:**

| Equipment | Cost |
|---|---|
| Large Grader (14G) | $778.00 |
| Vibratory Roller | $778.00 |
| Excavator (C315) | $805.00 |
| Excavator (C330) | $1,406.00 |
| Dozer (D8) | $1,406.00 |
| Small backhoe (C580) | $321.00 |
| Water truck (2,500 gallons) | $190.00 |
| 10-12 cy highway dump truck X 8 | $1,304.00 |
| 20 cy highway dump trucks w/pup X 3 | $573.00 |
| Off Road Dump Truck | $774.00 |
| Skidder | $778.00 |
| **TOTAL** | $9,113 |

**GRAND TOTAL** **$578,740**

Compiled By: Will Lawrence Date: 01/22/2014

## SUMMARY OF CONSTRUCTION COSTS

**SALE NAME:** Mulaker
**ROAD:** New Road Construction

**NEW CONSTRUCTION:** 76.65 **STATIONS** 1.45 **MILES**
**IMPROVEMENT:** _____ **STATIONS** _____ **MILES**

**POINTS:** A to B, C to D, 2A to 2B (2.9), 2C to 2D (0.7), 3A to 3B, 4F to 4G, 4h to 4I, 4J to 4K

**CLEARING & GRUBBING**

| Method | Acres/amount | x | Rate | = | Cost |
|---|---|---|---|---|---|
| Scatter outside of right of way | | x | | = | |
| A to B (23.7), C to D (2.5) | 3.2 | x | $ 1,337.00 | = | $4,278.40 |
| 2A to 2B (2.9), 2C to 2D (0.7), 3A to 3B (1.0), | 5.5 | x | $ 1,337.00 | = | $7,353.50 |
| | | | | = | |

**SUB TOTAL FOR CLEARING & GRUBBING** $11,632

**EXCAVATION**

| | Material | $$/amount | x | Rate | = | Cost |
|---|---|---|---|---|---|---|
| Designed Road | Common drift $$/cuyd A to B , C to D , 2A to | 6,260 | x | $1.80 | = | $11,268.00 |
| Field Design Roads | Balanced Construction $$/Sta 3A to 3B, 3C | 20.7 | x | $122.00 | | $2,525.40 |
| | End-haul excavation | 2,000 | x | $3.50 | = | $7,000.00 |
| | Embankment compaction | 6,570 | x | $0.70 | = | $4,599.00 |
| | Waste material compaction | 2,000 | x | $0.40 | = | $800.00 |
| | Cut slope rounding | 15 | x | $43.00 | = | $645.00 |
| | Landing construction - Points D, 1A, 1B, 1D, 2 | 21 | x | $389.00 | = | $8,169.00 |
| | | | x | | = | |
| | | | x | | = | |
| | | | x | | = | |
| | | | x | | = | |
| | | | x | | = | |

**SUB TOTAL FOR EXCAVATION** $35,006

**CULVERT MATERIALS AND INSTALLATION**

| | Location | Dia/type | Lineal ft. | Rate | Cost | Location | Dia/type | Lineal ft. | Rate | Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| A to B | 1+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| | 3+80 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| | 11+80 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| | 14+40 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| | 16+25 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| | 19+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| C to D | 0+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 2A to 2B | 7+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| | 9+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| | 13+75 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 2C to 2D | 2+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 3A to 3B | 1+80 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 4F to 4G | 1+00 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 4H to 4I | 0+00 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 4J to 4K | 0+00 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| | Description | Quantity | Rate | Cost |
|---|---|---|---|---|
| Other/miscellaneous: | French drain construction | 3.00 | $155.00 | $465.00 |
| | Geotextile fabric (9+60 to 22+40)/French drains | 1,370 | $1.30 | $1,781.00 |
| | Fabric labor | 6 | $40.00 | $240.00 |
| | Dissipator construction | 1 | $155.00 | $155.00 |
| | Fill armor placement | 3 | $155.00 | $465.00 |
| Culvert stakes & markers: | Carsonite posts | 15 | $20.00 | $300.00 |
| | | | | |

**SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION** $12,976

*Subtotal of Clearing, Exc., Culv.* ***$59,614***

**SURFACING**

Subgrade prep:

| Description | Stations/ amount | x | Rate/ sta/amt | Cost |
|---|---|---|---|---|
| Grade, Shape and Ditch 16' | 76.65 | x | $24.83 | $1,903.22 |
| Subgrade Compaction | 76.65 | x | $20.19 | $1,547.56 |

| ROAD SEGMENT | A to B | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A to B | | 0+00 to 23+70 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Base Rock | 4"-0" Crushed | 0+00 to 23+70 | 10 | station | 63 | stations | 23.70 | 1,493 | $8.52 | $12,721 | |
| Junctions | 4"-0" Crushed | 0+00, 7+50, 23+70 | 10 | junction | 22 | junctions | 3 | 66 | $8.52 | $562 | |
| Turnouts | 4"-0" Crushed | 5+25, 7+50, 15+25, 17+60, 21+00 | 10 | TO | 33 | TO's | 5 | 165 | $8.52 | $1,406 | |
| Widening | 4"-0" Crushed | 8+00 to 9+50 | 10 | N/A | N/A | N/A | N/A | 55 | $8.52 | $469 | |
| Turnaround | 4"-0" Crushed | 23+70 | 10 | TA | 44 | TA | 1 | 44 | $8.52 | $375 | |
| Surfacing Rock | 1 1/2"-0" Crushed | 0+00 to 23+70 | 3 | station | 19 | stations | 24 | 450 | $8.52 | $3,837 | |
| Junctions | 1 1/2"-0" Crushed | 0+00, 7+50, 23+70 | 3 | junction | 22 | junctions | 3 | 66 | $8.52 | $562 | |
| Turnouts | 1 1/2"-0" Crushed | 5+25, 7+50, 15+25, 17+60, 21+00 | 3 | TO | 11 | TO's | 5 | 55 | $8.52 | $469 | |
| Fill Armor | 24"-6" Riprap | 16+25 | N/A | N/A | N/A | N/A | N/A | 110 | $12.04 | $1,324 | |
| Dissipator/French Drain | 24"-6' Riprap | 11+80, 9+60 to 16+25 | N/A | N/A | N/A | N/A | N/A | 58 | $12.04 | $698 | |
| Total Rock for Road Segment: | | | A to B | | | | | 2,562 | | | $22,423 |

| ROAD SEGMENT | C to D | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | C to D | | 0+00 to 2+50 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Base Rock | 4"-0" Crushed | 0+00 to 2+50 | 10 | station | 66 | stations | 2.50 | 165 | $8.52 | $1,406 | |
| Landing | 6"-0" Pit-run | 2+50 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | C to D | | | | | 231 | | | $2,175 |

| ROAD SEGMENT | 1A | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1A | | N/A | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 1A | | | | | 88 | | | $957 |

| ROAD SEGMENT | 1B | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1B | | N/A | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 1B | | | | | 66 | | | $770 |

| ROAD SEGMENT | 1C | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1C | | N/A | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 1C | | | | | 66 | | | $770 |

| ROAD SEGMENT | 2A to 2B | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2A to 2B | | 0+00 to 24+75 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 24+75 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 24+75 | 10 | station | 63 | stations | 24.75 | 1,559 | $8.52 | $13,285 | |
| Turnouts | 4"-0" Crushed | 4+80, 7+40, 10+50, 16+50, | 10 | junction | 22 | junctions | 4 | 88 | $8.52 | $750 | |
| Fill Widening | 4"-0" Crushed | 23+50 to 24+50 | 10 | station | 16 | stations | 1.00 | 16 | $8.52 | $136 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Traction Rock | 1 1/2"-0" Crushed | 7+50 to 23+50 | 3 | station | 19 | junctions | 16 | 304 | $8.52 | $2,590 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 7+00, 9+0013+75, | N/A | culvert | 11 | culverts | 3 | 33 | $8.52 | $281 | |
| Total Rock for Road Segment: | | | 2A to 2B | | | | | 2,088 | | | $17,999 |

| ROAD SEGMENT | 2C to 2D | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2C to 2D | | 0+00 to 5+00 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 5+00 | 10 | station | 63 | stations | 5.00 | 315 | $8.52 | $2,684 | |
| Turnouts | 4"-0" Crushed | 2+50 | 10 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 2+00 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | 2C to 2D | | | | | 414 | | | $3,735 |

| ROAD SEGMENT | 3A+3B | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3A+3B | | 0+00 to 10+70 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 9+00, 10+70 | N/A | landing | 66 | landings | 2 | 132 | $11.66 | $1,539 | |
| Base Rock | 4"-0" Crushed | 0+00 to 10+70 | 10 | station | 63 | stations | 10.70 | 674 | $8.52 | $5,743 | |
| Turnouts | 4"-0" Crushed | 5+00, 9+00 | 10 | turnout | 22 | turnoouts | 2 | 44 | $8.52 | $375 | |
| Turnouts | 4"-0" Crushed | 0+00 | 10 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 1+80 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | 3A+3B | | | | | 883 | | | $7,938 |

| ROAD SEGMENT | 3C+3D | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3C+3D | | 0+00 to 2+00 | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 2+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 2+00 | 10 | station | 63 | stations | 2.00 | 126 | $8.52 | $1,074 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 3C+3D | | | | | 214 | | | $2,031 |

| ROAD SEGMENT | 3E | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3E | | N/A | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 3E | | | | | 88 | | | $957 |

| ROAD SEGMENT | 3F | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3F | | N/A | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 3F | | | | | 66 | | | $770 |

| ROAD SEGMENT | 3G | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3G | | N/A | | | | | |
| Application | Rock Size | | Depth of Rock | Volume (CY) | | Number | | TOTAL VOLUME | Rate/ Sta./ | Cost | |

| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 3G | | | | | 66 | | | $770 |
| **ROAD SEGMENT** | **4A** | | | **POINT TO POINT** | 4A | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 4A | | | | | 66 | | | $770 |
| **ROAD SEGMENT** | **4B** | | | **POINT TO POINT** | 4B | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 4B | | | | | 66 | | | $770 |
| **ROAD SEGMENT** | **4C** | | | **POINT TO POINT** | 4C | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 4C | | | | | 66 | | | $770 |
| **ROAD SEGMENT** | **4D** | | | **POINT TO POINT** | 4D | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 4D | | | | | 88 | | | $957 |
| **ROAD SEGMENT** | **4E** | | | **POINT TO POINT** | 4E | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 4E | | | | | 88 | | | $957 |
| **ROAD SEGMENT** | **4F to 4G** | | | **POINT TO POINT** | 4F to 4G | **Sta. to Sta.** | 0+00 to 2+00 | | | | |
| 4E Landing | 6"-0" Pit-run | 2+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 2+00 | 10 | station | 63 | stations | 2.00 | 126 | $8.52 | $1,074 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 1+00 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | 4F to 4G | | | | | 225 | | | $2,124 |
| **ROAD SEGMENT** | **4H to 4I** | | | **POINT TO POINT** | 4H to 4I | **Sta. to Sta.** | 0+00 to 1+00 | | | | |
| Landing | 6"-0" Pit-run | 1+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 1+00 | 10 | station | 63 | stations | 1.00 | 63 | $8.52 | $537 | |
| Junctions | 4"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 0+00 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | 4H to 4I | | | | | 162 | | | $1,587 |
| **ROAD SEGMENT** | **4J to 4K** | | | **POINT TO POINT** | 4J to 4K | **Sta. to Sta.** | 0+00 to 2+50 | | | | |
| Landing | 6"-0" Pit-run | 2+50 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 2+50 | 10 | station | 63 | stations | 2.50 | 158 | $8.52 | $1,342 | |
| Junctions | 4"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Bedding and backfill | 1 1/2"-0" Crushed | 0+00 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | 4J to 4K | | | | | 257 | | | $2,393 |
| **ROAD SEGMENT** | **5A** | | | **POINT TO POINT** | 5A | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Junctions | 1 1/2"-0" Crushed | 0+00 | 3 | junction | 22 | junctions | 1 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | 5A | | | | | 88 | | | $957 |
| **ROAD SEGMENT** | **5B to 5C** | | | **POINT TO POINT** | 5B to 5C | **Sta. to Sta.** | 0+00 to 2+50 | | | | |
| Landing | 6"-0" Pit-run | 2+50 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Base Rock | 4"-0" Crushed | 0+00 to 1+00 | 10 | station | 63 | stations | 2.50 | 158 | $8.52 | $1,342 | |
| Total Rock for Road Segment: | | | 5B to 5C | | | | | 224 | | | $2,111 |
| **ROAD SEGMENT** | **5D** | | | **POINT TO POINT** | 5D | **Sta. to Sta.** | N/A | | | | |
| Landing | 6"-0" Pit-run | 0+00 | N/A | landing | 66 | landings | 1 | 66 | $11.66 | $770 | |
| Total Rock for Road Segment: | | | 5D | | | | | 66 | | | $770 |

Processing:

| Description | No.sta | Rate/sta | Cost |
|---|---|---|---|
| Water, Process & Compact: 4"-0" Crushed | 76.60 | $56.48 | $4,326 |
| Water, Process & Compact: 1 1/2"-0" Crushed | 23.70 | $56.48 | $1,339 |

| | 24"-6" | 6"-0"pr | 4"-0" | 1 1/2"-0" | Total | | |
|---|---|---|---|---|---|---|---|
| **SUB TOTAL FOR SURFACING** | 168 | 1,518 | 5,380 | 1,161 | 8,228 | 8,228 | **$84,574** |

**SPECIAL PROJECTS**

| Description | Cost |
|---|---|
| Seed and mulch (waste areas) | $ 500.00 |

**SUB TOTAL FOR SPECIAL PROJECTS** $500

*Subtotal of Clearing, Exc.,Culv.* *$59,614*
*Subtotal of Surfacing, Special* *$85,074*

**GRAND TOTAL** **$144,688**

Compiled By: C.Bangs/K.Berry

Date: 12/10/2013

## SUMMARY OF CONSTRUCTION COSTS

**SALE NAME:** Mulaker — **NEW CONSTRUCTION:** _____ STATIONS _____ MILES
**ROAD:** I1-I2(197+50), I3-I4(55+50), I5-I6(96+90), I7-I8(19+0 — **IMPROVEMENT:** 468.80 STATIONS 8.88 MILES
**POINTS:** I9-I10(4+10), I11-I12(17+60), I13-I14(6+70), I15-I16(27+80), I17-I18(13+70), I23-I24(10+00), I25-I26(20+00

**CLEARING & GRUBBING**

| | Method | | Acres/amount | x | Rate | = | Cost |
|---|---|---|---|---|---|---|---|
| I9 to I10 | Tree and stump removal | (C315 hrs) | 2 | x | 101 | = | $202.00 |

**SUB TOTAL FOR CLEARING & GRUBBING** $202

**EXCAVATION**

| | Material | | Cy/amount | x | Rate | = | Cost |
|---|---|---|---|---|---|---|---|
| I1 to I2 | | | | | | | |
| 7+10 | Culvert Dissipator | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| 32+80 | Culvert Dissipator | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| 37+00 to 38+00 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 2.00 | x | $101.00 | = | $202.00 |
| 80+30 | Culvert Dissipator | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| 152+70 | Ditchout improvement | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| I3 to I4 | | | | | | | |
| Approx. 7.0 sta. | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 15.00 | x | $101.00 | = | $1,515.00 |
| | | (Dump truck hrs.) | 15.00 | x | $79.00 | = | $1,185.00 |
| I5 to I6 | | | | | | | |
| 4+90 to 7+10 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 4.50 | x | $101.00 | = | $454.50 |
| 6+10 | Construct ditchout | (C315 hrs.) | 3.00 | x | $101.00 | = | $303.00 |
| 47+80 to 50+30 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 4.00 | x | $101.00 | = | $404.00 |
| | | (Dump truck hrs.) | 4.00 | x | $79.00 | = | $316.00 |
| 50+30 | Ditchout improvement | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| I7 to I8 | | | | | | | |
| 16+00 | Ditchout improvement | (C315 hrs.) | 1.00 | x | $101.00 | = | $101.00 |
| I9 to I10 | | | | | | | |
| 0+00 to 4+10 | Removal of trees and stumps | (C315 hrs.) | 2.00 | x | $101.00 | = | $202.00 |
| I11 to I12 | | | | | | | |
| 11+30 to 13+40 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 4.00 | x | $101.00 | = | $404.00 |
| I15 to I16 | | | | | | | |
| 0+00 to 3+00 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 5.00 | x | $101.00 | = | $505.00 |
| | | (Dump truck hrs.) | 5.00 | x | $79.00 | = | $395.00 |
| 6+50 to 8+00 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 3.00 | x | $101.00 | = | $303.00 |
| | | (Dump truck hrs.) | 3.00 | x | $79.00 | = | $237.00 |
| 24+80 to 27+80 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 5.00 | x | $101.00 | = | $505.00 |
| | | (Dump truck hrs.) | 5.00 | x | $79.00 | = | $395.00 |
| I17 to I18 | | | | | | | |
| 3+90 to 4+60 | Ditchline reestablishment and cut slope | | | | | | |
| | improvement | (C315 hrs.) | 1.50 | x | $101.00 | = | $151.50 |
| | | (Dump truck hrs.) | 1.50 | x | $79.00 | = | $118.50 |
| I23 to I24 | | | | | | | |
| 0+00 | Construct new road junction alignment | | | | | | |
| | | (C330) | 5.00 | x | $155.00 | = | $775.00 |
| | | (D8) | 5.00 | x | $158.00 | = | $790.00 |
| | | (Dump truck hrs.) | 5.00 | x | $79.00 | = | $395.00 |
| | | (Vibratory Roller) | 2.00 | x | $77.00 | = | $154.00 |
| | | (14G) | 2.00 | x | $100.00 | = | $200.00 |

**SUB TOTAL FOR EXCAVATION** $10,516

**CULVERT MATERIALS AND INSTALLATION**

| Location | Dia/type | Lineal ft. | Rate | Cost | Location | Dia/type | Lineal ft. | Rate | Cost |
|---|---|---|---|---|---|---|---|---|---|
| **I1 to I2** | | | | | | | | | |
| 7+10 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 12+80 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 32+80 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 39+40 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 51+70 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 80+30 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 107+90 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| 176+20 | 18/CPP | 40 | $19.53 | $781.20 | | | | | |
| **I5 to I6** | | | | | | | | | |
| 87+50 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| **I11 to I12** | | | | | | | | | |
| 10+90 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| 15+60 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |
| **I23 to I24** | | | | | | | | | |
| 5+30 | 18/CPP | 30 | $19.53 | $585.90 | | | | | |

| | | Description | Quantity | Rate | Cost |
|---|---|---|---|---|---|
| Other/miscellaneous: | | Culvert repair (Labor hrs.) | 8.00 | $40.00 | $320.00 |
| | I9 to I10 | Tree and stump removal (Labor hrs.) | 2.00 | $40.00 | $80.00 |
| Culvert stakes & markers: | | Fiberglass culvert markers | 17 | $20.00 | $340.00 |

**SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION** $9,138

*Subtotal of Clearing, Exc., Culv.* ***$19,855***

**SURFACING**

Subgrade prep:

| Description | Stations/ amount | x | Rate/ sta/amt | Cost |
|---|---|---|---|---|
| Grade, Shape and Ditch 16'-includes sod removal (sta.) | 468.80 | x | $24.83 | $11,640.30 |
| Extra grader hours for sod removal/surface prep. | | | | |
| (I7-I8, I9-I10, I15-I16,I17-I18, I23-I24, I25-I26) | 40.00 | x | $100.00 | $4,000.00 |
| Scatter sod and ditch material (backhoe hrs.) | 80.00 | x | $77.00 | $6,160.00 |
| Subgrade Compaction (Sta.) | 468.80 | x | $20.19 | $9,465.07 |

| ROAD SEGMENT | I1 to I2 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I1 to I2 | | 0+00 to 197+50 | | TOTAL | Rate/ | Cost | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) | Sta./ amt. | | |
| Subgrade Leveling | 3/4"-0" Crushed | 2+30, 5+60, 12+20, 28+70, 43+40, 47+10 | N/A | Load | 11 | Loads | 6 | 66 | $8.52 | $562 | |
| Turnout Subgrade Improvement | 4"-0" Crushed | 40+40, 61+30, | N/A | TO | 11 | TO's | 2 | 22 | $8.52 | $187 | |
| Surfacing | 3/4"-0" Crushed | 0+00 to 73+90 | 3 | Station | 19 | Stations | 73.90 | 1,404 | $8.52 | $11,963 | |
| Junctions | 3/4"-0" Crushed | 24+60, 49+20, 50+00, 63+60, 73+90 | 3 | Junction | 11 | Junctions | 5 | 55 | $8.52 | $469 | |
| Turnouts | 3/4"-0" Crushed | 10+50, 16+20, 27+30, 34+20, 37+50, 43+40, 52+20, 61+90, 66+30, 70+80 | 3 | TO | 11 | TO's | 10 | 110 | $8.52 | $937 | |
| Subgrade Leveling | 1 1/2"-0" Crushed | 76+60, 140+70, 163+10, 165+90, 170+00, 196+80 | N/A | Load | 11 | Loads | 6 | 66 | $8.52 | $562 | |
| Surfacing | 1 1/2"-0" Crushed | 73+90 to 197+50 | 3 | Station | 19 | Stations | 124 | 2,348 | $8.52 | $20,008 | |
| Junctions | 1 1/2"-0" Crushed | 103+40, 105+20, 133+90, 155+70, 160+80, 179+80 | 3 | Junction | 11 | Junctions | 6 | 66 | $8.52 | $562 | |
| Turnouts | 1 1/2"-0" Crushed | 78+50, 86+00, 89+90, 96+80, 110+10, 114+80, 127+50, 154+20, 164+40, 170+20, 173+20, 184+40, 191+30 | 3 | TO | 11 | TO's | 13 | 143 | $8.52 | $1,218 | |
| Culvert Bedding/Backfill | 1 1/2"-0" Crushed | 7+10, 12+80, 32+80, 39+40, 51+70, 80+30, 107+90, 176+20, | N/A | Culvert | 11 | Culverts | 8 | 88 | $8.52 | | |
| Additional Culvert Bedding/Backfill | 1 1/2"-0" Crushed | 176+20 | N/A | Load | 11 | Loads | 3 | 33 | $8.52 | $281 | |
| Culvert Dissipator Rock | 24"-6" Riprap | 7+10, 32+80, 80+30 | N/A | Culvert | 11 | Culverts | 3 | 33 | $12.04 | $397 | |
| Total Rock for Road Segment: | | | I1 to I2 | | | | | 4,434 | | | $37,148 |

| ROAD SEGMENT | I3 to I4 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I3 to I4 | | 0+00 to 55+50 | | TOTAL | Rate/ | Cost | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) | Sta./ amt. | | |
| Subgrade Leveling | 1 1/2"-0" Crushed | 8+40, 15+20, 24+00, 41+16, 53+90 | N/A | Load | 11 | Loads | 5.00 | 55 | $8.52 | $469 | |
| Turnout Subgrade Improvement | 4"-0" Crushed | 5+30 | N/A | TO | 11 | TO's | 1 | 11 | $8.52 | | |
| Surfacing | 1 1/2"-0" Crushed | 0+00 to 55+50 | 3 | Station | 19 | Stations | 55.50 | 1,055 | $8.52 | $8,984 | |
| Junctions | 1 1/2"-0" Crushed | 4+70, 7+70, 44+50, 46+00 | 3 | Junction | 11 | Junctions | 4 | 44 | $8.52 | $375 | |
| Turnouts | 1 1/2"-0" Crushed | 5+30, 14+90, 24+10, 29+20, 39+10, 51+10 | N/A | TO | 11 | TO's | 6 | 66 | $8.52 | $562 | |
| Total Rock for Road Segment: | | | I3 to I4 | | | | | 1,231 | | | $10,390 |

| ROAD SEGMENT | I5 to I6 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I5 to I6 | | 0+00 to 95+10 | | TOTAL | Rate/ | Cost | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) | Sta./ amt. | | |
| Subgrade Leveling | 1 1/2"-0" Crushed | 9+20, 14+30, 89+10, 90+60 | N/A | Load | 11 | Loads | 4 | 44 | $8.52 | $375 | |
| Turnout Subgrade Improvement | 4"-0" Crushed | 7+50, 16+50, 43+50, 73+50, | N/A | TO | 11 | TO's | 4 | 44 | $8.52 | $375 | |
| Surfacing | 1 1/2"-0" Crushed | 0+00 to 95+10 | 2 | Station | 13 | Stations | 95.1 | 1,236 | $8.52 | $10,533 | |
| Junctions | 1 1/2"-0" Crushed | 1+50, 88+30 | 2 | Junction | 11 | Junctions | 2 | 22 | $8.52 | $187 | |
| Turnouts | 1 1/2"-0" Crushed | 7+50, 11+00, 16+50, 18+80, 27+50, 31+60, 36+70, 43+50, 48+75, 54+60, 57+10, 60+30, 73+50, 82+80 | 2 | TO | 11 | TO's | 14 | 154 | $8.52 | $1,312 | |
| Culvert Bedding/Backfill | 1 1/2"-0" Crushed | 87+50 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | I5 to I6 | | | | | 1,511 | | | $12,876 |

| ROAD SEGMENT | I7 to I8 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I7 to I8 | | 0+00 to 19+00 | | TOTAL | Rate/ | Cost | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) | Sta./ amt. | | |
| Subgrade Leveling | 4"-0" Crushed | 2+75, 8+60 | N/A | Load | 11 | Loads | 2 | 22 | $8.52 | $187 | |
| Surfacing | 4"-0" Crushed | 0+00 to 19+00 | 4 | Station | 25 | Stations | 19.0 | 475 | $8.52 | $4,047 | |
| Junctions | 4"-0" Crushed | 6+50 | 4 | Junction | 11 | Junctions | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | I7 to I8 | | | | | 508 | | | $4,328 |

| ROAD SEGMENT | I9 to I10 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I9 to I10 | | 0+00 to 4+10 | | TOTAL | Rate/ | Cost | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) | Sta./ amt. | | |
| Subgrade Leveling | 4"-0" Crushed | 0+70 | N/A | Load | 11 | Loads | 1 | 11 | $8.52 | $94 | |
| Surfacing | 4"-0" Crushed | 0+00 to 4+10 | 4 | Station | 25 | Stations | 4.2 | 105 | $8.52 | $895 | |
| Total Rock for Road Segment: | | | I9 to I10 | | | | | 116 | | | $988 |

| ROAD SEGMENT | I11 to I12 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Application | Rock Size | | Depth of Rock | I11 to I12 Volume (CY) | | 0+00 to 17+60 Number | | TOTAL VOLUME | Rate/ Sta./ | Cost | |
| Subgrade Leveling | 4"-0" Crushed | 12+60 | N/A | Load | 11 | Loads | 1 | 11 | $8.52 | $94 | |
| Turnout Subgrade Improvement | 4"-0" Crushed | 12+80 | N/A | TO | 11 | TO's | 1 | 11 | $8.52 | $94 | |
| Surfacing | 4"-0" Crushed | 0+00 to 17+60 | 4 | Station | 25 | Stations | 17.6 | 440 | $8.52 | $3,749 | |
| Junctions | 4"-0" Crushed | 0+90, 1+60, | 4 | Junction | 11 | Junctions | 2 | 22 | $8.52 | $187 | |
| Turnouts | 4"-0" Crushed | 3+50, 9+50, 12+80, 14+70 | 4 | TO | 11 | TO's | 4 | 44 | $8.52 | $375 | |
| Culvert Bedding/Backfill | 1 1/2"-0" Crushed | 10+90, 15+60 | N/A | culvert | 11 | culverts | 2 | 22 | $8.52 | $187 | |
| Total Rock for Road Segment: | | | I11 to I12 | | | | | 550 | | | $4,686 |
| ROAD SEGMENT | I13 to I14 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | I13 to I14 Volume (CY) per | | 0+00 to 6+70 Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Subgrade Leveling | 4"-0" Crushed | 4+30 | N/A | Load | 11 | Loads | 1 | 11 | $8.52 | $94 | |
| Surfacing | 4"-0" Crushed | 0+00 to 6+70 | 4 | Station | 25 | Stations | 6.7 | 168 | $8.52 | $1,427 | |
| Total Rock for Road Segment: | | | I13 to I14 | | | | | 179 | | | $1,521 |
| ROAD SEGMENT | I15 to I16 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | I15 to I16 Volume (CY) per | | 0+00 to 27+80 Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Subgrade Leveling | 4"-0" Crushed | 5+90, 26+50 | N/A | Load | 11 | Loads | 2 | 22 | $8.52 | $187 | |
| Surfacing | 4"-0" Crushed | 0+00 to 27+80 | 4 | Station | 25 | Stations | 27.8 | 695 | $8.52 | $5,921 | |
| Turnouts | 4"-0" Crushed | 16+16, 20+50, 22+80, 24+00 | 4 | TO | 11 | TO's | 4 | 44 | $8.52 | $375 | |
| Total Rock for Road Segment: | | | I15 to I16 | | | | | 761 | | | $6,484 |
| ROAD SEGMENT | I17 to I18 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | I17 to I18 Volume (CY) | | 0+00 to 13+70 Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Surfacing | 4"-0" Crushed | 0+00 to 13+70 | 4 | Station | 25 | Stations | 13.7 | 343 | $8.52 | $2,918 | |
| Turnouts | 4"-0" Crushed | 8+90 | 4 | TO | 11 | TO's | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | I17 to I18 | | | | | 354 | | | $3,012 |
| ROAD SEGMENT | I23 to I24 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | I23 to I24 Volume (CY) per | | 0+00 to 10+00 Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Surfacing | 4"-0" Crushed | 0+00 to 10+00 | 4 | Station | 25 | Stations | 10.0 | 250 | $8.52 | $2,130 | |
| Realignment Surfacing | 4"-0" Crushed | 0+00 | 4 | Station | 25 | Stations | 2.0 | 50 | $8.52 | $426 | |
| Realignment Base | 4"-0" Crushed | 0+00 | 10 | Station | 63 | Stations | 1.0 | 63 | $8.52 | $537 | |
| Culvert Bedding/Backfill | 1 1/2"-0" Crushed | 5+30 | N/A | culvert | 11 | culverts | 1 | 11 | $8.52 | $94 | |
| Total Rock for Road Segment: | | | I23 to I24 | | | | | 374 | | | $3,186 |
| ROAD SEGMENT | I25 to I26 | | | POINT TO POINT | | Sta. to Sta. | | | | | |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | I25 to I26 Volume (CY) per | | 0+00 to 20+00 Number of | | TOTAL VOLUME (CY) | Rate/ Sta./ amt. | Cost | |
| Subgrade Leveling | 4"-0" Crushed | 0+00 to 20+00 | N/A | Load | 11 | Loads | 10 | 110 | $8.52 | $937 | |
| Total Rock for Road Segment: | | | I25 to I26 | | | | | 110 | | | $937 |

Processing:

| Description | No.sta | Rate/sta | Cost |
|---|---|---|---|
| Water, Process & Compact: | 468.80 | $56.48 | $26,478 |
| | | | |
| | | | |

| | 24'-6" rr | 6"-0"pr | 4"-0" | 1 1/2"-0" | 3/4"-0" | Total | |
|---|---|---|---|---|---|---|---|
| SUB TOTAL FOR SURFACING | 33 | | 2,995 | 5,464 | 1,635 | 10,127 | $143,300 |

**SPECIAL PROJECTS**

| Description | Cost |
|---|---|
| Seeding and mulching | $400.00 |
| | |

**SUB TOTAL FOR SPECIAL PROJECTS** $400

*Subtotal of Surfacing & Spec. Proj.* *$143,700*
*Subtotal of Clearing, Exc.,Culv.* *$19,855*

**GRAND TOTAL** **$163,556**

Compiled By: Will Lawrence Date: 01/21/2013

**SUMMARY OF ROCK DEVELOPMENT AND CRUSHING COSTS**

PROJECT NO. 3 **Timber Sale Name: Mulaker**

Quarry: Northrup Ridge Swell:

Location: SE 1/4, SE 1/4, See. 17, T6N, R6W Shrink: 16%

County: Clatsop

By: C.Bangs Loading Hopper: Yes

Date: 01/14/2014

| ROCK SIZE | REJECT | GRADATION | STOCKPILE CU. YDS. | TRUCK MEAS CU. YDS. | TOTAL CU. YDS. |
|---|---|---|---|---|---|
| 3/4"-0" | 5% | CR | | 1,635 | 1,635 |
| 1-1/2"-0" | 5% | CR | | 6,999 | 6,999 |
| 4"-0" | 5% | CR | | 11,154 | 11,154 |
| 6"-0" | | PR | | 1,518 | 1,518 |
| 24"-6" | | RR | | 498 | 498 |
| 36" | | RR | | | |
| **TOTAL CUBIC YARDS OF ROCK:** | | | | 21,804 | **21,804** |

**1) MOBILIZATION & SET UP:**

| EQUIPMENT | QUANTITY | RATE | COST | EQUIPMENT | QUANTITY | RATE | COST |
|---|---|---|---|---|---|---|---|
| Screening Plants | 2 | $553 | $1,106 | Off Highway Dump Truck | 1 | $774 | $774 |
| 3 Stage Crusher | 1 | $2,891 | $2,891 | D8 cat | 1 | $1,406 | $1,406 |
| Loading Hopper | 1 | $553 | $553 | Excavator | 1 | $1,406 | $1,406 |
| Drill & Compressor | 1 | $1,406 | $1,406 | Loader | 1 | $805 | $805 |
| Powder | 1 | $351 | $351 | | | | |
| 2nd Drill Move-in | 1 | $750 | $750 | | | | |
| | | | | | | | |
| | | | | | | | |

SUB TOTAL FOR MOBILIZATION $11,448

| 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** $16,309

**2) CLEARING & GRUBBING**

| DESCRIPTION | QUANTITY | UNIT | RATE | COST |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**TOTAL CLEARING & GRUBBING COSTS**

## 3) EXCAVATION

| MATERIAL DESCRIPTION | QUANTITY | UNIT | RATE | COST |
|---|---|---|---|---|
| Overburden Removal (excavate, load | 1,000 | bcy | $3.00 | $3,000 |
| haul, spread) | | | | |
| Overburden Removal (excavate, drift) | 2,000 | bcy | $2.50 | $5,000 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**TOTAL EXCAVATION COSTS** $8,000

## 4) DEVELOP ROCK

**ROCK SUMMARY**

| Type | Cu. yd. Vol. | Weight |
|---|---|---|
| crushed | 19,788 | 91% |
| pit run | 1,518 | 7% |
| rip rap | 498 | 2% |
| Total | 21,804 | |
| reject | 989 | 4.5% |

| METHOD | % | QUANTITY | RATE | COST |
|---|---|---|---|---|
| Ripping | 25% | 5,451 | $2.60 | $14,173 |
| Drill & shoot | 75% | 17,095 | $2.70 | $46,157 |
| Oversize red | 3% | 639 | $5.80 | $3,707 |
| Other | | | | |

**TOTAL ROCK DEVELOPMENT COSTS** $64,036

## 5) CALIBRATION & TESTING

| DESCRIPTION | NO. | $/TEST | COST |
|---|---|---|---|
| Calibrate | 2 | $507.00 | $1,014 |
| Calibrate | | | |
| Test | 10 | $57.30 | $573 |
| Test | | | |
| | | | |
| | | | |

**TOTAL CALIBRATION & TESTING COSTS** $1,587

## 6) FEEDING & LOADING

| DESCRIPTION | CU. YD. QUANTITY | COST CU. YD. | TOTAL COST |
|---|---|---|---|
| Dig & Feed Rock | 20,777 | $0.84 | $17,361 |
| Shot rock handling (Exc.) | 80 | $155.00 | $12,400 |
| | | | |

**TOTAL FEEDING & LOADING COSTS** $29,761

## 7) ROCK CRUSHING

| ROCK SIZE | ROCK TYPE | CU. YD. QUANTITY | CRUSHER TYPE | HOURLY PRODUCTION | RATE CU. YD. | TOTAL COST |
|---|---|---|---|---|---|---|
| 3/4"-0" | crushed | 1,635 | 3 stage w/s | 110 | $3.54 | $5,782 |
| 1-1/2"-0" | crushed | 6,999 | 3 stage w/s | 120 | $3.24 | $22,688 |
| 4"-0" | crushed | 11,154 | 2 stage w/s | 140 | $2.48 | $27,646 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**TOTAL ROCK CRUSHING COSTS** $56,116

**8) STOCKPILING**

STOCKPILE SITE PREPARATION

| Equipment | Hours | Rate | Total |
|---|---|---|---|
| Dozer | | $120.00 | |
| Compactor | | $72.00 | |
| Grader | | $90.00 | |
| Excavator | | $138.00 | |
| | | | |

SUB TOTAL

| Rock for Floor (CY) | $/CY Haul | Total |
|---|---|---|
| | | |

| HAUL & STOCKPILE<br>STOCKPILE LOCATION | SIZE | # of<br>TRUCKS | CU. YDS. | RATE | COST |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |

SUB TOTAL

**TOTAL STOCKPILING COSTS**

**9) MISCELLANEOUS COSTS**

| DESCRIPTION | COST |
|---|---|
| Load, Haul, and Spread the reject material at the waste area. | $2,968 |
| $3.00 /CY 989 CY | |
| | |
| 2nd Drilling Move-in bench preparation (excavator hrs.) | $930 |
| | |
| Final Quarry Dev., Access Road Const., Waterbarring, Drainage, | $1,550 |
| Block Quarry Access | |
| | |
| | |

**TOTAL MISCELLANEOUS COSTS** $5,448

**10) GRAND TOTAL:** **$181,259**

$/Cubic Yard $9.16

**Footnotes:**

# Mulaker Timber Sale

## Vacating Costs

| Work Description | Station | C.Y.s | C315 | D24 trk | D10/12 trk | D-8 | Labor | Straw | Seed-lbs |
|---|---|---|---|---|---|---|---|---|---|
| Mobilization | | | | | 3 | | | | |
| (Dump truck with tilt trailer) | | | | | | | | | |
| **V1:** | | | | | | | | | |
| Construct waterbar | | | | | | | | | |
| Remove existing culvert | | | | | | | | | |
| Pull back slopes along failure | | | | | | | | | |
| Reestablish stream channel | | | 3.00 | | | | 1 | 4 | 10 |
| **V2-V3:** | | | | | | | | | |
| Walk to back end (V3) | | | 0.50 | | | | | | |
| (V2) Construct waterbar | 0+00 | | 0.25 | | | | | | |
| Construct waterbar | 1+60 | | 0.25 | | | | | | |
| Pull back slopes along failure | 2+00 | | 1.50 | | | | 0.5 | 2 | 5 |
| Construct waterbar | 2+40 | | 0.25 | | | | | | |
| Construct waterbar | 4+15 | | | | | | | | |
| Remove existing culvert | 5+10 | | | | | | 0.5 | 2 | 5 |
| Pull back slopes along fill | | | | | | | | | |
| Reestablish stream channel | | | 2.00 | | | | | | |
| Construct waterbar | 7+30 | | 0.25 | | | | | | |
| (V3) Construct waterbar | 9+00 | | 0.25 | | | | | | |
| Haul off old culverts | | | 0.25 | | | | | | |
| **Total Quantity (Hours)** | | | 8.50 | 0 | 3 | 0 | 2 | 8 | 20 |
| **Total Cubic yards** | | 0 | | | | | | | |
| **Rates** | | | $101.00 | $127.00 | $99.00 | $158.00 | $40.00 | $10.73 | $1.60 |
| **Total Dollars** | | | $859 | $0 | $297 | $0 | $80 | $86 | $32 |

**Total Segment Cost** **$1,353**

# Mulaker Timber Sale

## Vacating Costs

| Work Description | Station | C.Y.s | C330 | D24 trk | D10/12 trk | D-8 | Labor | Straw | Seed-lbs |
|---|---|---|---|---|---|---|---|---|---|
| Mobilization | | | | | | | | | |
| **V4 to V5:** | | | | | | | | | |
| Waterbar, block, outsloping | 0+00 to 12+00 | | 3.00 | | | | | | |
| Remove culvert and fill | 0+30 | | 1.00 | | | | 1 | 5 | 10 |
| Remove culvert and fill | 1+00 | | 1.00 | | | | 1 | 5 | 10 |
| Sidecast pullback | 1+00 to 2+60 | | 2.00 | | | | 2 | 8 | 20 |
| Remove culvert and fill | 3+85 to 4+25 | | 2.00 | | | | 1 | 5 | 10 |
| Sidecast pullback | 6+60 to 11+00 | | 4.00 | | | | 4 | 20 | 40 |
| Remove culvert and fill | 9+25 | | 2.00 | | | | 2 | 10 | 20 |
| Remove culvert and fill | 11+00 | | 1.00 | | | | 1 | 5 | 10 |
| **V6 to V7:** | | | | | | | | | |
| Waterbar, block, outsloping | 0+00 to 19+20 | | 3.00 | | | | | | |
| Sidecast pullback | 0+00 to 19+20 | | 10.00 | | | | 6 | 30 | 60 |
| Remove culvert and fill | 1+20 | | 3.00 | | | | 2 | 10 | 20 |
| Remove culvert and fill | 8+25 | | 3.00 | | | | 2 | 10 | 20 |
| Remove culvert and fill | 10+40 | | 1.00 | | | | 1 | 5 | 10 |
| Remove culvert and fill | 12+95 | | 1.00 | | | | 1 | 5 | 10 |
| Remove culvert and fill | 15+30 | | 2.00 | | | | 1 | 5 | 10 |
| Remove road fill | 17+25 | | 1.00 | | | | 1 | 5 | 10 |
| **All Segments:** | | | | | | | | | |
| Haul off old culverts | | | | | 4 | | | | |
| **Total Quantity (Hours)** | | | 40.00 | 0 | 4 | 0 | 26 | 128 | 260 |
| **Total Cubic yards** | | 0 | | | | | | | |
| **Rates** | | | $155.00 | $127.00 | $79.00 | $158.00 | $40.00 | $10.73 | $1.60 |
| **Total Dollars** | | | $6,200 | $0 | $316 | $0 | $1,040 | $1,373 | $416 |

**Total Segment Cost** **$9,345**

# HAUL and STOCKPILE COST

SALE NAME: Mulaker
QUARRY: Northrup Ridge 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 |
| | | | | | | |

Truck type: D12 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: #DIV/0! /cy
Load: $0.00 /cy
Stockpile: #N/A /cy

Production: cy/day = 0

**Location 1. 0** **Haul and Stockpile Cost** **#DIV/0! /cy**

**Location 2. 0**

| ONE WAY HAUL IN MILES | | | | | | |
|---|---|---|---|---|---|---|
| 50 MPH | 30 MPH | 25 MPH | 20 MPH | 15 MPH | 10 MPH | 5 MPH |
| | | 7.50 | | 1.30 | | |

Truck type: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: #DIV/0! /cy
Load: $0.00 /cy
Stockpile: #N/A /cy

Production: cy/day = 0

**Location 2. 0** **Haul and Stockpile Cost** **#DIV/0! /cy**

**Location 3. 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: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: #DIV/0! /cy
Load: $0.00 /cy
Stockpile: #N/A /cy

Production: cy/day = 0

**Location 3. 0** **Haul and Stockpile Cost** **#DIV/0! /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: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: #DIV/0! /cy
Load: $0.00 /cy
Stockpile: #N/A /cy

Production: cy/day = 0

**Location 4. 0 Haul & Stockpile Cost #DIV/0! /cy**

**Location 5. Block Quarry Access**

| ONE WAY HAUL IN MILES | | | | | | |
|---|---|---|---|---|---|---|
| 50 MPH | 30 MPH | 25 MPH | 20 MPH | 15 MPH | 10 MPH | 5 MPH |
| | | | | | | 0.10 |

Truck type: D20 No. trucks: 2
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: $1.52 /cy
Load: $0.00 /cy
Stockpile: $0.83 /cy

Production: cy/day = 1,054

**Location 5. Block Quarry Access Haul & Stockpile Cost $2.35 /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: D20 No. trucks:
Delay min.: 15 Efficiency: 75%

Truck type: D12 No. trucks:
Delay min.: 12 Efficiency: 75%

Truck type: D10 No. trucks:
Delay min.: 10 Efficiency: 75%

Ave haul: #DIV/0! /cy
Load: $0.00 /cy
Stockpile: #N/A /cy

Production: cy/day = 0

**Location 6. 0 Haul & Stockpile Cost #DIV/0! /cy**

## Projects Road Maintenance Cost Summary

**Sale:** Mulaker
**Date:** 22-Jan-14
**By:** C.Bangs

| Type | Equipment/Rationale | | | Hours | Rate | Cost | |
|---|---|---|---|---|---|---|---|
| | Grader 14G | | | 15 | $100 | $1,500 | |
| Final Haul | Dump Truck 12CY | | | 4 | $79 | $316 | |
| Road | FE Loader C966 | | | 4 | $83 | $332 | |
| Maintenance | Vibratory Roller | | | 15 | $77 | $1,155 | |
| Haul Route | Water Truck 2,500 gallon | | | 10 | $89 | $890 | |
| **Total** | | | | | | | $4,193 |

Production Rates

| Miles/day | Distance(miles) | Days |
|---|---|---|
| 1.5 | 2.0 | 1.3 |
| 1.5 | 2.0 | 1.3 |

Grader
Vibratory Roller

Northrup Creek and portion of Foster

## Road Maintenance Cost Summary

**Sale:** Mulaker
**Date:** 21-Jan-14
**By:** Kevin Berry

**MBF:** 10,242
**$$/MBF:** $2.71

| Type | Equipment/Rationale | Move-in Rate | Times | Hours | Rate | Cost |
|---|---|---|---|---|---|---|
| Progressive Operations 1st Entry | Grader 14G | $675 | 1 | 16 | $90 | $2,115 |
| | Dump Truck 10CY x 2 | $282 | 2 | 8 | $73 | $1,450 |
| | FE Loader C966 | $675 | 1 | 8 | $74 | $1,267 |
| Progressive Operations 2nd Entry | Grader 14G | $675 | 1 | 16 | $90 | $2,115 |
| | Dump Truck 10CY x 2 | $282 | 2 | 8 | $73 | $1,450 |
| | FE Loader C966 | $675 | 1 | 8 | $74 | $1,267 |
| Final Road Maintenance | Grader 14G | $675 | 1 | 50 | $90 | $5,175 |
| | Dump Truck 10CY x 3 | $423 | 2 | 16 | $73 | $2,759 |
| | FE Loader C966 | $675 | 1 | 16 | $74 | $1,859 |
| | Vibratory Roller | $675 | 1 | 50 | $72 | $4,275 |
| | Water Truck 2,500 gallon | $165 | 1 | 50 | $78 | $4,065 |
| **Total** | | | | | | $27,797 |

**Production Rates**

| Production Rates | Miles/day | Distance(miles) | Days |
|---|---|---|---|
| Grader | 2.5 | 8.0 | 3.2 |

| Production Rates | Miles/day | Distance(miles) | Days |
|---|---|---|---|
| Grader | 2.5 | 5.0 | 2.0 |

| Production Rates | Miles/day | Distance(miles) | Days |
|---|---|---|---|
| Grader | 1.5 | 10.3 | 6.9 |
| Vibratory Roller* | 1.5 | 10.3 | 6.9 |

*Final Road Maintenance Only

# Mulaker
# TIMBER CRUISE REPORT
# FY 2014

1. Sale Area Location: Areas 1 through 6 are located in portions of Sections 19, 30, 31, and 32, T6N, R6W, and Section 36, T6N, R7W, and Section 1 T5N, R7W, W.M., Clatsop County, OR.

2. **Fund Distribution:** BOF 100%
Tax Code 8-01 (100%)

3. **Sale Acreage by Area:**

| Area | Treatment | Gross Acres | Existing R/W | New R/W | Stream Buffer | GTRA | Non-Thinnable | Net Acres | Survey Method |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Modified Clearcut | 77 | 4 | 0 | 2 | 0 | n/a | 71 | GIS |
| 2 | Modified Clearcut | 63 | 1 | 1 | 2 | 2 | n/a | 57 | GIS |
| 3 | Partial Cut | 73 | 3 | 1 | 3 | n/a | 0 | 66 | GIS |
| 4 | Partial Cut | 116 | 0 | 1 | 11 | n/a | 0 | 104 | GIS |
| 5 | Partial Cut | 79 | 2 | 0 | 2 | n/a | 17 | 58 | GIS |
| 6 R/W | Right-of-way | 6 | n/a | n/a | n/a | n/a | n/a | 6 | LxW |
| **TOTALS** | | **414** | **10** | **3** | **20** | **2** | **17** | **362** | |

**4. Cruisers and Cruise Dates:**
All areas were cruised by Nick Haile, Derek Bangs, Kevin Berry, and Dave Rygell between 12/12/2013 and 1/03/2014.

**5. Cruise Method and Computation:**
Areas 1 and 2 are Modified Clearcut units and were variable plot cruised using a 40 BAF. These plots are located on a 4 chain by 10 chain grid, with every third plot measured and graded. A total of 45 plots were sampled, with 18 measured and graded plots, and 27 count plots.

Area 3 is a Partial Cut unit and was variable plot cruised using a 40 BAF. These plots are located on a 2 chain by 10 chain grid, with every second plot measured and graded. A total of 36 plots were sampled, with 19 measured and graded plots, and 17 count plots.

Area 4 and 5 are Partial Cut units and was variable plot cruised using a 33.61 BAF. These plots are located on a 4 chain by 10 chain grid, with every third plot measured and graded. A total of 41 plots were sampled, with 17 measured and graded plots, and 24 count plots.

Data was collected on Corvallis MicroTechnology (CMT) data collectors, and downloaded to the Atterbury Super A.C.E. program in 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.

| AREA | CRUISE | TRACT | TYPE | ACRES |
|---|---|---|---|---|
| 1 and 2 | MULK_NEW | AREA1 & 2 | 00CC | 128 |
| 3 | MULK_NEW | AREA3 | P170 | 66 |
| 4 and 5 | MULK_NEW | AREA4 & 5 | THIN | 162 |
| 6 R/W | MULK_NEW | AREA 6 | R/W | 6 |

**6. Timber Description:**
Areas 1 and 2 are modified clearcut units, approximately 70 to 80 years-old, consisting of Douglas-fir, with minor amounts of western hemlock, red alder, and western redcedar. The average Douglas-fir tree size to be harvested is 24.1 inches DBH, with an average height of 99 feet to a merchantable top (7 inch d.o.b.) The average western hemlock/true-fir tree size is 17.7 inches DBH and 43 feet to a merchantable top (7 inch d.o.b) The average red alder tree size 14.8 inches DBH and 37 feet to a merchantable top (7 inch d.o.b). The net volume per acre to be harvested is 57.1 MBF.

Area 3 is an "auto-mark" thinning (SDI 35) of second growth Douglas-fir approximately 108 years of age. The "biggest and best" trees were recorded as "leave" trees to meet a target residual basal area of 170 $ft^2$/acre. The average Douglas-fir tree size to be harvested is 20.6 inches DBH, with an average height of 91 feet to a merchantable top (7 inch d.o.b.). The net volume per acre to be harvested is 21.4 MBF. There are minor amount of western redcedar, western hemlock, and red alder that will be reserved.

Area 4 and 5 are "auto-mark" thinnings (SDI 30) of second growth Douglas-fir approximately 35 years of age. The "biggest and best" trees were recorded as "leave" trees to meet a target residual basal area of 130 $ft^2$/acre. The average Douglas-fir tree size to be harvested is 14.8 inches DBH, with an average height of 46 feet to a merchantable top (7 inch d.o.b.). The average hemlock tree size is 14.6 inches DBH and 46 feet to a merchantable top (7 inch d.o.b.). The net volume per acre to be harvested is 7.2 MBF. There are minor amount of western redcedar, Sitka Spruce, and bigleaf maple that will be reserved.

Area 6 R/W is similar to the timber description mentioned above in Areas 1 and 2. The average volume (net) is approximately 57.1 MBF/acre.

**7. Statistical Analysis and Stand Summary**

Statistics for Stand B.F. volumes

| Area | Estimated CV | Target SE% | Actual CV | Actual SE% |
|---|---|---|---|---|
| 1 and 2 (MC) | 45% | 8% | 33.8% | 5.0% |
| 3 (PC) | 40% | 8% | 37.7% | 6.3% |
| 4 and 5 (PC) | 40% | 8% | 25.1% | 3.9% |

**8. Volumes by Species and Log Grade:**

Volumes by Species and Grade for All Sale Areas: (MBF) Volumes do not include "in-growth."

| Species | DBH | Net Vol. | 2 Saw | 3 Saw | 4 Saw | Camp Run | % D & B | % Sale |
|---|---|---|---|---|---|---|---|---|
| Douglas-fir | 20.0" | 9,647 | 7,618 | 1,742 | 287 | | 2.3 | 94 |
| Hemlock/True-fir | 16.5" | 280 | 174 | 81 | 25 | | 1.9 | 2 |
| Red Alder/other Hardwoods | 14.8" | 314 | | | | 314 | 4.1 | 3 |
| Western Red Cedar | 26.0" | >1 | | | | | | >1 |
| **TOTALS** | | **10,241** | **7,792** | **1,823** | **312** | **314** | | |

**9. Approvals:**

**Prepared by:** Kevin Barry **Date:** 1/14/2014

**Unit Forester Approval:** [signature] **Date:** 2/12/14

**10. Attachments:**

Cruise Designs and Maps - 9 pages
Volume Reports - 5 pages
Statistics Reports -8 pages
Log Stock Tables - 3 pages
Stand Table Summary – 2 pages

Revised August, 2002

# CRUISE DESIGN
# ASTORIA DISTRICT

**Sale Name:** Mulaker **Area(s)** 1 & 2

**Harvest Type:** Modified Clearcut

**Approx. Cruise Acres:** 128 **Estimated CV%** 45 Net BF or BA/Acre **SE% Objective** 8

**Planned Sale Volume:** 6,656 **Estimated Sale Area Value/Acre:** $ 18,200

**A. Cruise Goals:** (a) Grade minimum 96 conifer 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:** BAF 40 (Full point; Half point) (circle one)
Cruise Line Direction(s) 360' Az
Cruise Line Spacing 10 chains
Cruise Plot Spacing 4 chains
Grade/Count Ratio 1:2

Record all hardwood as camp run. Record all cedar as leave. Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least ½ chain outside the buffer.

**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 < 18" dbh and 40% of dob @ FP for trees > 18" dbh.

**4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

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; R = Camp Run; 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.

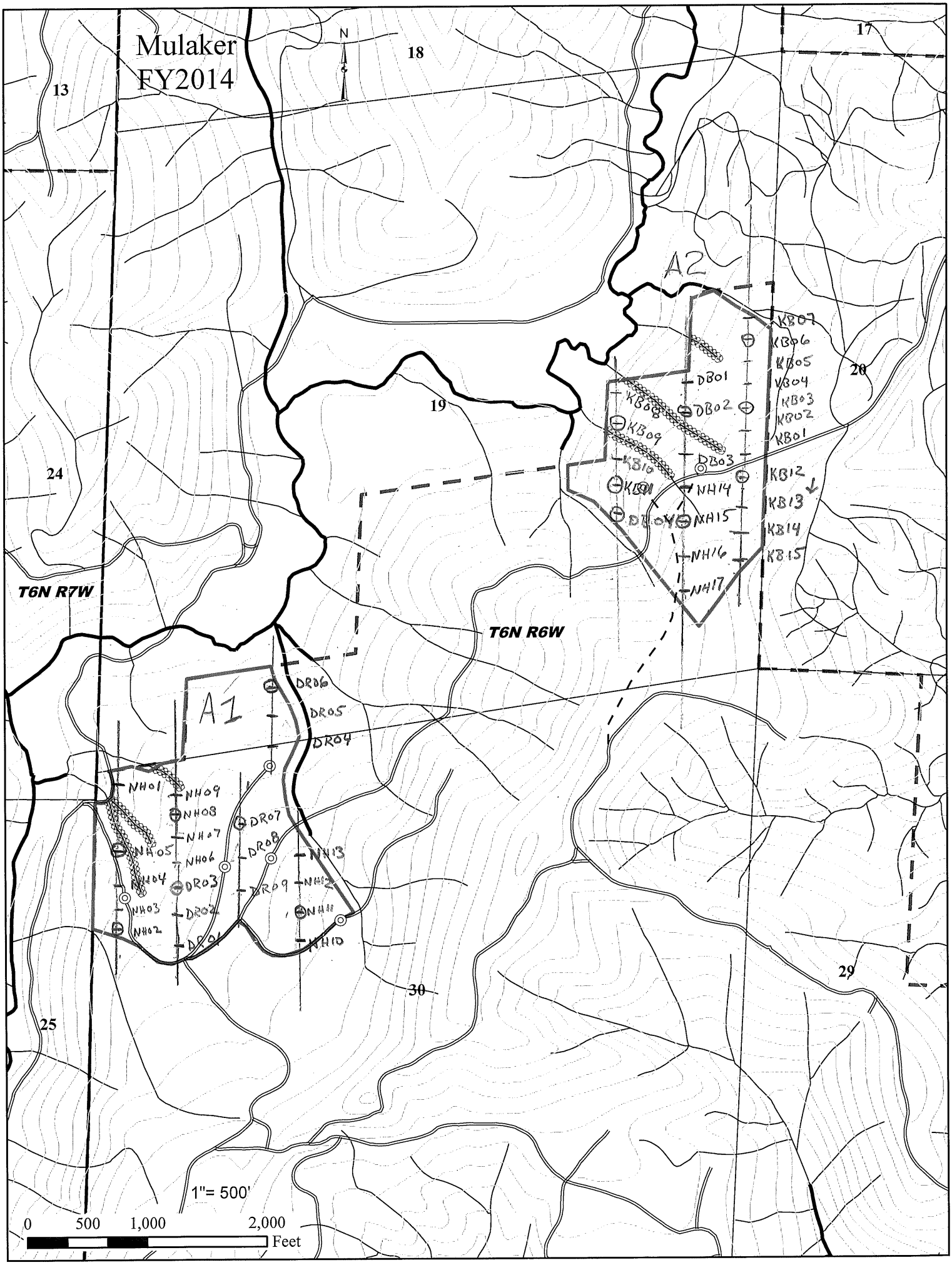
8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy 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, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.
   ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop, Rangefinder,Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards in Tatum OR Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

Cruise Design by: Kevin Berry
Approved by: _____
Date: 11-7-2013

X:\Jewell_Unit\Timber Sales\2014\Mulaker\Sale Prep\Cruise\Designs\CC\Mulaker CC Cruise design.docx


Mulaker
FY2014
N
13
18
17
19
20
24
25
29
30
T6N R7W
T6N R6W
A1
A2
DR06
DR05
DR04
DR07
DR08
DR09
DR03
DR02
DR01
NH01
NH09
NH08
NH07
NH05
NH06
NH04
NH03
NH02
NH13
NH12
NH11
NH10
DB01
DB02
DB03
KB08
KB09
KB10
KB11
NH14
NH15
NH16
NH17
KB07
KB06
KB05
KB04
KB03
KB02
KB01
KB12
KB13
KB14
KB15
1"= 500'
0
500
1,000
2,000
Feet

Revised August, 2002

# CRUISE DESIGN
# ASTORIA DISTRICT

**Sale Name:** Mulaker **Area(s)** 3

**Harvest Type:** Partial Cut

**Approx. Cruise Acres:** 67 **Estimated CV%** 40 Net BF or BA/Acre **SE% Objective** 8

**Planned Sale Volume:** 840 **Estimated Sale Area Value/Acre:** $ 4,200

**A. Cruise Goals:** (a) Grade minimum 200 conifer 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:** BAF 40 (Full point; Half point) (circle one)
Cruise Line Direction(s) 90' Az
Cruise Line Spacing 10 chains
Cruise Plot Spacing 2 chains
Grade/Count Ratio 1:2

The BA target is 170 sqft. Leaving 4-5 trees per plot. All conifer not DF are leave trees. Record all hardwood as camp run. Record all snags as SN and record total height and diameter. If plot lands in buffer then offset at least ½ chain outside the buffer.

**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 < 18" dbh and 40% of dob @ FP for trees > 18" dbh.

**4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

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; R = Camp Run; 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.

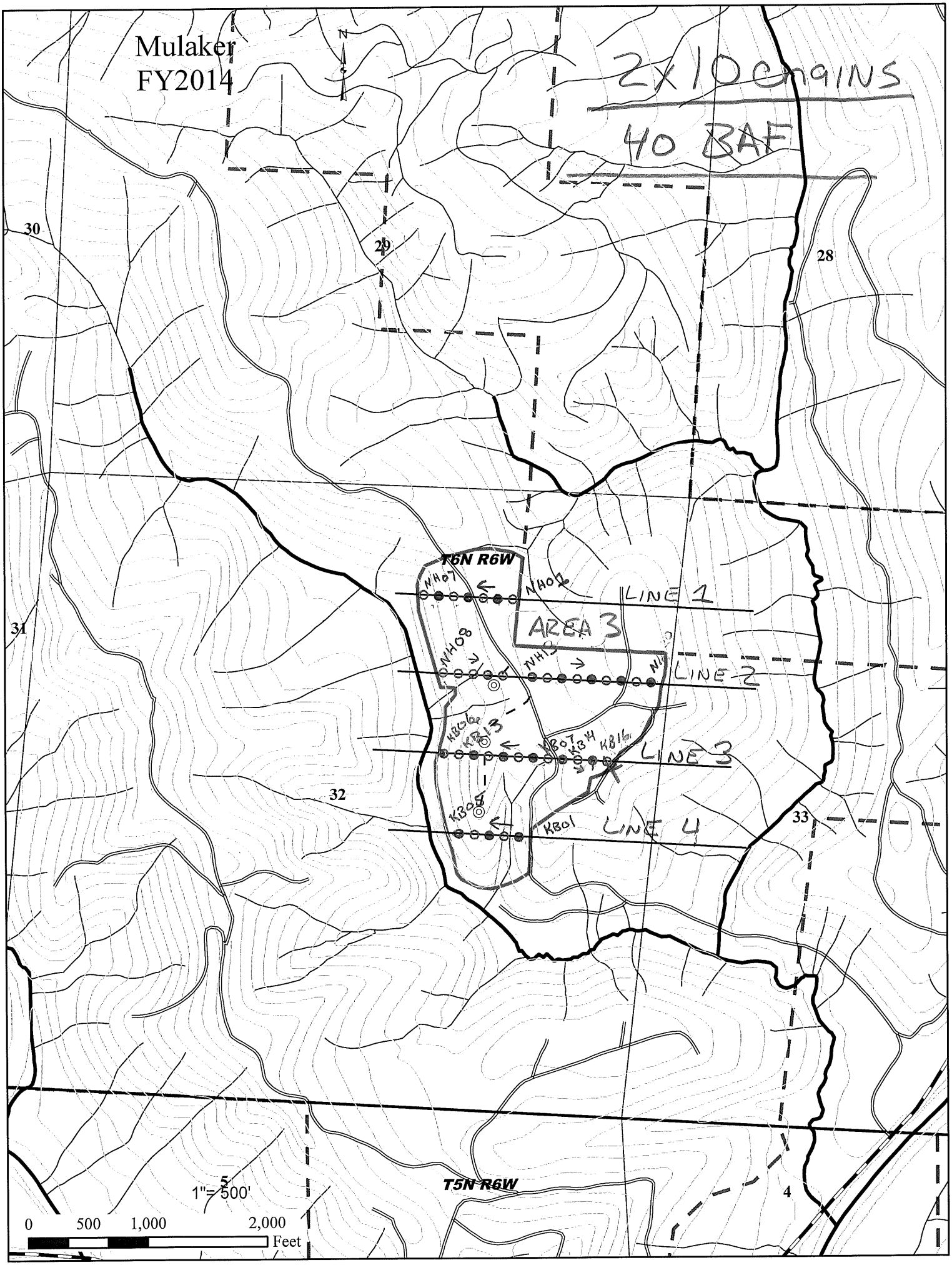
8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy 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, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.
   ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop, Rangefinder,Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards in Tatum OR Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

Cruise Design by: Kevin Berry
Approved by: _____
Date: 11-7-2013

X:\Jewell_Unit\Timber Sales\2014\Mulaker\Sale Prep\Cruise\Designs\PC_OFS\Mulaker PC OFS Cruise design.docx


Mulaker
FY2014
2x10 Gains
40 BAF
30
29
28
31
32
33
5
4
T6N R6W
T5N R6W
NH07
NH02
LINE 1
AREA 3
NH08
NH13
LINE 2
KB06
KB13
KB07
KB14
KB16
LINE 3
KB08
KB01
LINE 4
1"= 500'
0
500
1,000
2,000
Feet

Revised August, 2002

# CRUISE DESIGN
# ASTORIA DISTRICT

**Sale Name:** Mulaker **Area(s)** 4 & 5

**Harvest Type:** Thinning

**Approx. Cruise Acres:** 168 **Estimated CV%** 40 Net BF or BA/Acre **SE% Objective** 8

**Planned Sale Volume:** 1.064 **Estimated Sale Area Value/Acre:** $ 2,450

**A. Cruise Goals:** (a) Grade minimum 84 conifer 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:** BAF 33.61 (Full point; Half point) (circle one)
Cruise Line Direction(s) 360' Az
Cruise Line Spacing 10 chains
Cruise Plot Spacing 4 chains
Grade/Count Ratio 1:2

The BA target is 120 sqft. Leaving 4 trees per plot. All cedar and hardwood is leave trees. Record all hardwood as camp run. Record all snags as SN and record total height and diameter. If plot lands in buffer then offset at least ½ chain outside the buffer.Hardwood does not count toward BA.

**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 < 18" dbh and 40% of dob @ FP for trees > 18" dbh.

**4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

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; R = Camp Run; 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.

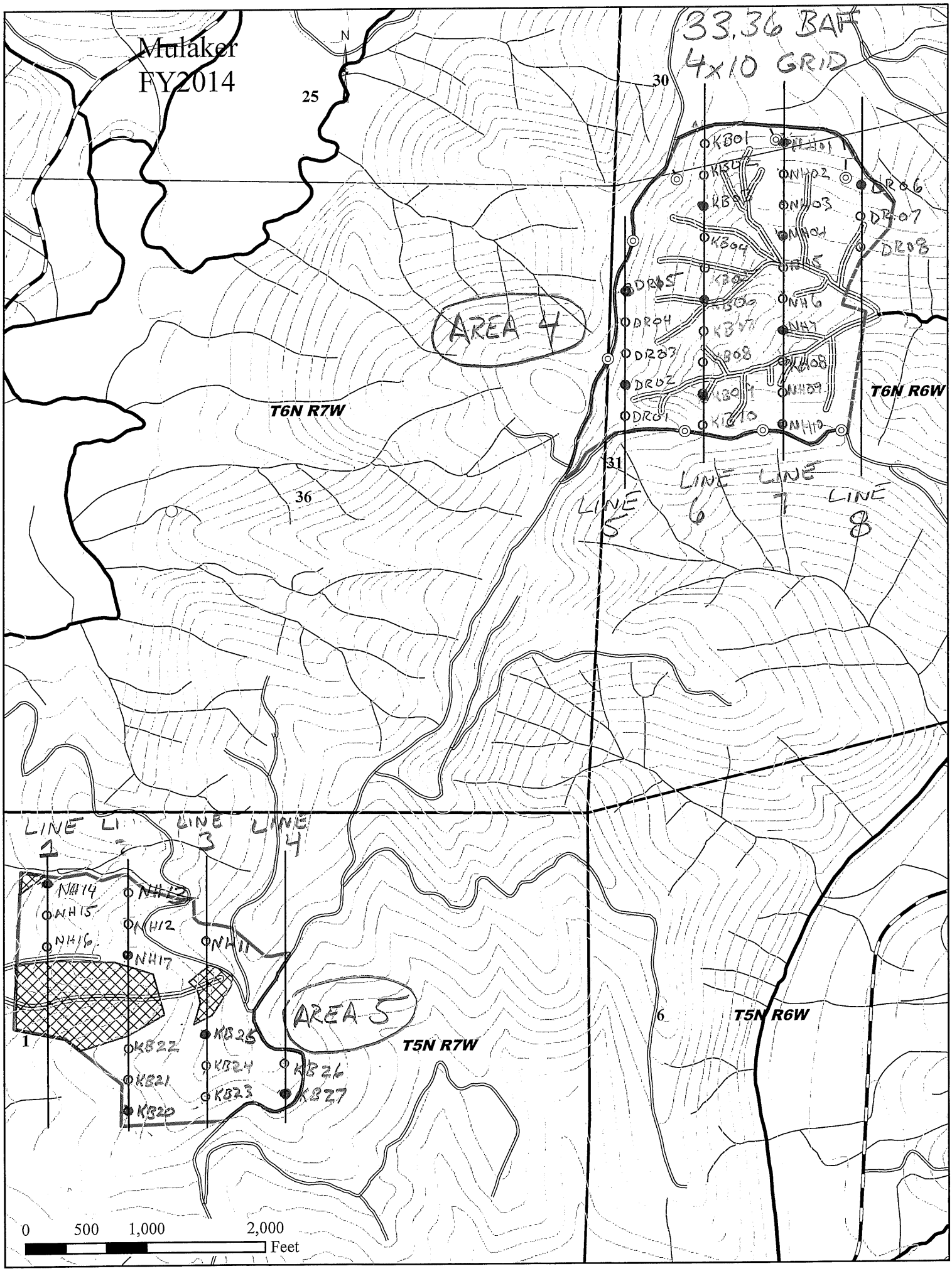
8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy 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, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.
   ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop, Rangefinder,Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards in Tatum OR Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

Cruise Design by: Kevin Berry
Approved by: _____
Date: 12-10-2013

X:\Jewell_Unit\Timber Sales\2014\Mulaker\Sale Prep\Cruise\Designs\Thinning\Mulaker Thinning Cruise design.docx


Mulaker
FY2014
N
25
30
31
36
33.36 BAF
4x10 GRID
AREA 4
AREA 5
T6N R7W
T6N R6W
T5N R7W
T5N R6W
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
KB01
KB02
KB03
KB04
KB05
KB06
KB07
KB08
KB09
KB10
NH01
NH02
NH03
NH04
NH05
NH06
NH07
NH08
NH09
NH10
DR01
DR02
DR03
DR04
DR05
DR06
DR07
DR08
NH11
NH12
NH13
NH14
NH15
NH16
NH17
KB21
KB22
KB23
KB24
KB25
KB26
KB27
KB28
0
500
1,000
2,000
Feet

TC PSPCSTGR

# Species, Sort Grade - Board Foot Volumes (Project)

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

**Project:** MULK_NEW
**Acres** 362.00

**Page** 1
**Date** 1/21/2014
**Time** 8:36:56AM

| Spp | S T | So Grt ad | % Net BdFt | Bd. Ft. per Acre Def% | Gross | Net | Total Net MBF | Percent of Net Board Foot Volume: Log Scale Dia. 4-5 | 6-11 | 12-16 | 17+ | Log Length 12-20 | 21-30 | 31-35 | 36-99 | Average Log Ln Ft | Bd Ft | CF/ Lf | Logs Per /Acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DOCU | | 100.0 | 171 | | | | | | | | | | | 19 | | 0.00 | 1.9 |
| D | | DO2S | 78 | 1.5 | 21,359 | 21,044 | 7,618 | | 4 | 41 | 55 | | 1 | 13 | 86 | 38 | 367 | 2.11 | 57.4 |
| D | | DO3S | 19 | 2.0 | 4,908 | 4,812 | 1,742 | 0 | 88 | 10 | 1 | 3 | 10 | 35 | 51 | 34 | 85 | 0.78 | 56.6 |
| D | | DO4S | 3 | 4.1 | 829 | 795 | 287 | 5 | 95 | | | 19 | 47 | 17 | 17 | 24 | 35 | 0.51 | 22.8 |
| **D Totals** | | | 94 | 2.3 | 27,266 | 26,650 | 9,647 | 0 | 22 | 34 | 44 | 1 | 4 | 17 | 78 | 34 | 192 | 1.36 | 138.7 |
| H | | DO2S | 56 | 3.1 | 376 | 364 | 132 | | 11 | 32 | 57 | | | 35 | 65 | 37 | 357 | 2.35 | 1.0 |
| H | | DO3S | 33 | .3 | 218 | 217 | 79 | | 100 | | | 16 | 6 | 36 | 42 | 27 | 78 | 0.83 | 2.8 |
| H | | DO4S | 11 | | 69 | 69 | 25 | | 100 | | | 12 | 25 | 47 | 16 | 25 | 43 | 0.57 | 1.6 |
| **H Totals** | | | 2 | 1.9 | 663 | 651 | 236 | | 50 | 18 | 32 | 7 | 5 | 37 | 52 | 28 | 121 | 1.13 | 5.4 |
| A | | DOCR | 100 | 4.1 | 884 | 848 | 307 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 10.8 |
| **A Totals** | | | 3 | 4.1 | 884 | 848 | 307 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 10.8 |
| WF | | DO2S | 97 | | 117 | 117 | 42 | | | 14 | 86 | | | | 100 | 40 | 933 | 4.12 | .1 |
| WF | | DO3S | 3 | | 3 | 3 | 2 | | | 100 | | 100 | | | | 16 | 80 | 1.25 | .0 |
| **WF Totals** | | | 0 | | 120 | 120 | 44 | | | 17 | 83 | 3 | | | 97 | 34 | 720 | 3.78 | .2 |
| M | | DOCR | 100 | | 19 | 19 | 7 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .2 |
| **M Totals** | | | 0 | | 19 | 19 | 7 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .2 |
| C | | DOCU | | 100.0 | 1 | | | | | | | | | | | 24 | | 0.00 | .0 |
| C | | DO3S | 100 | | 1 | 1 | 0 | | 20 | 80 | | | 100 | | | 22 | 100 | 1.20 | .0 |
| **C Totals** | | | 0 | 61.5 | 2 | 1 | 0 | | 20 | 80 | | | 100 | | | 23 | 67 | 0.78 | .0 |
| **Totals** | | | | 2.3 | 28,954 | 28,289 | 10,240 | 0 | 24 | 34 | 42 | 2 | 4 | 17 | 77 | 33 | 182 | 1.34 | 155.3 |

T TSPCSTGR

# Species, Sort Grade - Board Foot Volumes (Type)

**Project:** MULK_NEW



**Date** 1/17/2014

**Time** 9:00:31AM

**T06N R07W S19 TTAKE**

| Twp | Rge | Sec | Tract | Type | Acres | Plots | Sample Trees | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 06N | 07W | 19 | AREA 1 & 2 | TAKE | 128.00 | 45 | 100 | 1 | W |

**T06N R07W S19 TTAKE**

| Spp | ST | Sort | Grad | % Net BdFt | Bd. Ft. per Acre Def% | Gross | Net | Total Net MBF | Percent Net Board Foot Volume: Log Scale Dia. 4-5 | 6-11 | 12-16 | 17+ | Log Length 12-20 | 21-30 | 31-35 | 36-99 | Average Log: Ln Ft | Bd Ft | CF/ Lf | Logs Per /Acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | CU | | 100.0 | 265 | | | | | | | | | | | 6 | | 0.00 | 2.8 |
| D | | DO | 2S | 85 | 1.5 | 46,280 | 45,569 | 5,833 | | 2 | 39 | 59 | | | 12 | 88 | 39 | 398 | 2.25 | 114.5 |
| D | | DO | 3S | 13 | 1.2 | 7,089 | 7,001 | 896 | | 82 | 15 | 2 | 5 | 14 | 27 | 54 | 33 | 91 | 0.82 | 77.1 |
| D | | DO | 4S | 2 | | 699 | 699 | 89 | | 100 | | | 19 | 40 | 27 | 14 | 25 | 41 | 0.56 | 17.0 |
| **D** | **Totals** | | | 93 | 2.0 | 54,333 | 53,269 | 6,818 | | 14 | 35 | 50 | 1 | 2 | 15 | 82 | 35 | 252 | 1.66 | 211.4 |
| A | | DO | CR | 100 | 4.1 | 2,387 | 2,290 | 293 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 29.2 |
| **A** | **Totals** | | | 4 | 4.1 | 2,387 | 2,290 | 293 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 29.2 |
| H | | DO | 2S | 76 | 1.1 | 908 | 897 | 115 | | 12 | 35 | 53 | | | 29 | 71 | 37 | 348 | 2.23 | 2.6 |
| H | | DO | 3S | 19 | | 223 | 223 | 29 | | 100 | | | 42 | 9 | | 49 | 23 | 50 | 0.78 | 4.5 |
| H | | DO | 4S | 5 | | 53 | 53 | 7 | | 100 | | | | 44 | | 56 | 29 | 44 | 0.67 | 1.2 |
| **H** | **Totals** | | | 2 | .9 | 1,184 | 1,173 | 150 | | 33 | 27 | 40 | 8 | 4 | 22 | 66 | 28 | 142 | 1.35 | 8.3 |
| WF | | DO | 2S | 97 | | 316 | 316 | 40 | | | 14 | 86 | | | | 100 | 40 | 933 | 4.12 | .3 |
| WF | | DO | 3S | 3 | | 9 | 9 | 1 | | | 100 | | 100 | | | | 16 | 80 | 1.25 | .1 |
| **WF** | **Totals** | | | 1 | | 325 | 325 | 42 | | | 17 | 83 | 3 | | | 97 | 34 | 720 | 3.78 | .5 |
| M | | DO | CR | 100 | | 51 | 51 | 7 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .6 |
| **M** | **Totals** | | | 0 | | 51 | 51 | 7 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .6 |
| **Type Totals** | | | | | 2.0 | 58,279 | 57,108 | 7,310 | | 17 | 35 | 48 | 2 | 3 | 14 | 81 | 34 | 228 | 1.59 | 250.0 |

T TSPCSTGR

# Species, Sort Grade - Board Foot Volumes (Type)

**Project:** MULK_NEW

**Page** 1
**Date** 1/17/2014
**Time** 9:00:31AM

**T05N R06W S32 TTAKE**

| Twp | Rge | Sec | Tract | Type | Acres | Plots | Sample Trees | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 05N | 06W | 32 | AREA3 | TAKE | 66.00 | 36 | 30 | 1 | W |

**T05N R06W S32 TTAKE**

| Spp | S T | So rt | Gr ad | % Net BdFt | Bd. Ft. per Acre Def% | Gross | Net | Total Net MBF | Percent Net Board Foot Volume: Log Scale Dia. 4-5 | 6-11 | 12-16 | 17+ | Log Length 12-20 | 21-30 | 31-35 | 36-99 | Average Log: Ln Ft | Bd Ft | CF/ Lf | Logs Per /Acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | CU | | 100.0 | 170 | | | | | | | | | | | 16 | | 0.00 | .9 |
| D | | DO | 2S | 86 | .7 | 18,756 | 18,628 | 1,229 | | 8 | 43 | 50 | | | 9 | 91 | 39 | 337 | 1.87 | 55.3 |
| D | | DO | 3S | 10 | 1.4 | 2,104 | 2,074 | 137 | 4 | 96 | | | 6 | 13 | 28 | 54 | 32 | 65 | 0.67 | 32.0 |
| D | | DO | 4S | 4 | | 761 | 761 | 50 | 29 | 71 | | | 2 | 20 | 8 | 70 | 35 | 52 | 0.44 | 14.6 |
| **D** | **Totals** | | | 100 | 1.5 | 21,790 | 21,463 | 1,417 | 1 | 19 | 37 | 43 | 1 | 2 | 11 | 87 | 36 | 209 | 1.34 | 102.9 |
| **Type Totals** | | | | | 1.5 | 21,790 | 21,463 | 1,417 | 1 | 19 | 37 | 43 | 1 | 2 | 11 | 87 | 36 | 209 | 1.34 | 102.9 |

T TSPCSTGR

# Species, Sort Grade - Board Foot Volumes (Type)

Project: MULK_NEW

Page 1
Date 1/17/2014
Time 9:00:31AM

T006 R006 S31 TTAKE

| Twp | Rge | Sec | Tract | Type | Acres | Plots | Sample Trees | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 006 | 006 | 31 | AREA 4 & 5 | TAKE | 162.00 | 41 | 34 | 1 | W |

T006 R006 S31 TTAKE

| Spp | ST | Sort | Grad | % Net BdFt | Bd. Ft. per Acre Def% | Gross | Net | Total Net MBF | Percent Net Board Foot Volume: Log Scale Dia. 4-5 | 6-11 | 12-16 | 17+ | Log Length 12-20 | 21-30 | 31-35 | 36-99 | Average Log Ln Ft | Bd Ft | CF/ Lf | Logs Per /Acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | CU | | 100.0 | 93 | | | | | | | | | | | 40 | | 0.00 | 1.6 |
| D | | DO | 2S | 25 | 3.5 | 1,805 | 1,741 | 282 | | 27 | 73 | | | 14 | 50 | 36 | 33 | 159 | 1.29 | 10.9 |
| D | | DO | 3S | 61 | 3.0 | 4,246 | 4,117 | 667 | | 95 | 5 | | | 5 | 47 | 48 | 35 | 83 | 0.76 | 49.6 |
| D | | DO | 4S | 14 | 7.9 | 964 | 888 | 144 | | 100 | | | 25 | 62 | 13 | | 22 | 29 | 0.50 | 31.0 |
| **D** | **Totals** | | | 93 | 5.1 | 7,108 | 6,746 | 1,093 | | 78 | 22 | | 3 | 15 | 44 | 38 | 31 | 72 | 0.75 | 93.1 |
| H | | DO | 2S | 14 | 19.7 | 90 | 72 | 12 | | | | 100 | | | 100 | | 32 | 490 | 4.37 | .1 |
| H | | DO | 3S | 63 | .5 | 302 | 300 | 49 | | 100 | | | | 4 | 58 | 38 | 34 | 122 | 0.88 | 2.5 |
| H | | DO | 4S | 23 | | 111 | 111 | 18 | | 100 | | | 16 | 18 | 66 | | 24 | 43 | 0.52 | 2.6 |
| **H** | **Totals** | | | 7 | 3.8 | 502 | 483 | 78 | | 85 | | 15 | 4 | 7 | 66 | 24 | 29 | 93 | 0.84 | 5.2 |
| **Type Totals** | | | | | 5.0 | 7,611 | 7,229 | 1,171 | | 78 | 21 | 1 | 3 | 14 | 45 | 37 | 31 | 74 | 0.75 | 98.3 |

T TSPCSTGR

# Species, Sort Grade - Board Foot Volumes (Type)

Project: MULK_NEW

Page 1
Date 1/17/2014
Time 9:00:31AM

**T06N R07W S19 TR/W**

| Twp | Rge | Sec | Tract | Type | Acres | Plots | Sample Trees | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 06N | 07W | 19 | AREA 6 | R/W | 6.00 | 45 | 101 | 1 | W |

T06N R07W S19 TR/W

| Spp | S T | So rt | Gr ad | % Net BdFt | Bd. Ft. per Acre Def% | Gross | Net | Total Net MBF | Percent Net Board Foot Volume: Log Scale Dia. 4-5 | 6-11 | 12-16 | 17+ | Log Length 12-20 | 21-30 | 31-35 | 36-99 | Average Log Ln Ft | Bd Ft | CF/ Lf | Logs Per /Acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | CU | | 100.0 | 265 | | | | | | | | | | | 6 | | 0.00 | 2.8 |
| D | | DO | 2S | 85 | 1.5 | 46,280 | 45,569 | 273 | | 2 | 39 | 59 | | | 12 | 88 | 39 | 398 | 2.25 | 114.5 |
| D | | DO | 3S | 13 | 1.2 | 7,089 | 7,001 | 42 | | 82 | 15 | 2 | 5 | 14 | 27 | 54 | 33 | 91 | 0.82 | 77.1 |
| D | | DO | 4S | 2 | | 699 | 699 | 4 | | 100 | | | 19 | 40 | 27 | 14 | 25 | 41 | 0.56 | 17.0 |
| **D** | **Totals** | | | 93 | 2.0 | 54,333 | 53,269 | 320 | | 14 | 35 | 50 | 1 | 2 | 15 | 82 | 35 | 252 | 1.66 | 211.4 |
| A | | DO | CR | 100 | 4.1 | 2,387 | 2,290 | 14 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 29.2 |
| **A** | **Totals** | | | 4 | 4.1 | 2,387 | 2,290 | 14 | | 62 | 38 | | 15 | 10 | 5 | 70 | 26 | 78 | 0.97 | 29.2 |
| H | | DO | 2S | 76 | 1.1 | 908 | 897 | 5 | | 12 | 35 | 53 | | | 29 | 71 | 37 | 348 | 2.23 | 2.6 |
| H | | DO | 3S | 19 | | 223 | 223 | 1 | | 100 | | | 42 | 9 | | 49 | 23 | 50 | 0.78 | 4.5 |
| H | | DO | 4S | 5 | | 53 | 53 | 0 | | 100 | | | | 44 | | 56 | 29 | 44 | 0.67 | 1.2 |
| **H** | **Totals** | | | 2 | .9 | 1,184 | 1,173 | 7 | | 33 | 27 | 40 | 8 | 4 | 22 | 66 | 28 | 142 | 1.35 | 8.3 |
| C | | DO | CU | | 100.0 | 77 | | | | | | | | | | | 24 | | 0.00 | .2 |
| C | | DO | 3S | 100 | | 48 | 48 | 0 | | 20 | 80 | | | 100 | | | 22 | 100 | 1.20 | .5 |
| **C** | **Totals** | | | 0 | 61.5 | 125 | 48 | 0 | | 20 | 80 | | | 100 | | | 23 | 67 | 0.78 | .7 |
| WF | | DO | 2S | 97 | | 316 | 316 | 2 | | | 14 | 86 | | | | 100 | 40 | 933 | 4.12 | .3 |
| WF | | DO | 3S | 3 | | 9 | 9 | 0 | | | 100 | | 100 | | | | 16 | 80 | 1.25 | .1 |
| **WF** | **Totals** | | | 1 | | 325 | 325 | 2 | | | 17 | 83 | 3 | | | 97 | 34 | 720 | 3.78 | .5 |
| M | | DO | CR | 100 | | 51 | 51 | 0 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .6 |
| **M** | **Totals** | | | 0 | | 51 | 51 | 0 | | 100 | | | | | | 100 | 36 | 80 | 0.94 | .6 |
| **Type Totals** | | | | | 2.1 | 58,405 | 57,156 | 343 | | 17 | 35 | 48 | 2 | 3 | 14 | 81 | 34 | 228 | 1.59 | 250.7 |

TC PSTATS

# PROJECT STATISTICS

**PROJECT MULK NEW**



DATE 1/17/2014

| TWP | RGE | SC | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 006 | 006 | 31 | AREA 4 & 5 | THIN THR | 362.00 | 167 | 1,186 | 1 | W |
| 06N | 07W | 19 | AREA 6 | R/W | | | | | |

| | PLOTS | TREES | TREES PER PLOT | ESTIMATED TOTAL TREES | PERCENT SAMPLE TREES |
|---|---|---|---|---|---|
| TOTAL | 167 | 1186 | 7.1 | | |
| CRUISE | 72 | 422 | 5.9 | 45,624 | .9 |
| DBH COUNT | | | | | |
| REFOREST | | | | | |
| COUNT | 95 | 710 | 7.5 | | |
| 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 | 225 | 66.1 | 20.0 | 74 | | 144.4 | 27,266 | 26,650 | 6,437 | 6,399 |
| DOUGLEAV | 107 | 33.2 | 20.9 | 72 | | 79.5 | 14,043 | 13,775 | 3,337 | 3,311 |
| R ALDER | 14 | 8.5 | 14.8 | 37 | | 10.2 | 884 | 848 | 277 | 277 |
| SNAG | 20 | 7.1 | 16.1 | 41 | | 10.1 | | | | |
| HEMLEAV | 14 | 4.8 | 15.5 | 44 | | 6.2 | 809 | 789 | 209 | 209 |
| WHEMLOCK | 21 | 3.7 | 16.5 | 44 | | 5.5 | 663 | 651 | 174 | 174 |
| CEDLEAV | 11 | 1.1 | 21.3 | 59 | | 2.8 | 288 | 272 | 93 | 90 |
| ALDRLEAV | 2 | 1.0 | 8.8 | 26 | | .4 | 23 | 23 | 7 | 7 |
| WR CEDAR | 2 | .1 | 26.0 | 70 | | .3 | 46 | 18 | 11 | 5 |
| WH FIR | 2 | .0 | 38.0 | 140 | 0 | .3 | 120 | 120 | 21 | 21 |
| BL MAPLE | 2 | .2 | 16.0 | 37 | | .3 | 19 | 19 | 8 | 8 |
| SPRUCELV | 1 | .1 | 23.0 | 75 | | .2 | 29 | 29 | 8 | 8 |
| MAPLELV | 1 | .1 | 26.0 | 30 | | .4 | 7 | 7 | 6 | 6 |
| **TOTAL** | *422* | *126.0* | *19.5* | *67* | | *260.6* | *44,198* | *43,201* | *10,589* | *10,516* |

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

| CL 68.1 SD: 1.0 | COEFF VAR.% | S.E.% | SAMPLE TREES - BF LOW | AVG | HIGH | # OF TREES REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 92.4 | 6.2 | 734 | 783 | 831 | | | |
| DOUGLEAV | 92.5 | 8.9 | 1,080 | 1,186 | 1,292 | | | |
| R ALDER | 80.1 | 22.2 | 112 | 144 | 176 | | | |
| SNAG | | | | | | | | |
| HEMLEAV | 183.1 | 50.7 | 219 | 444 | 669 | | | |
| WHEMLOCK | 78.5 | 17.5 | 284 | 344 | 405 | | | |
| CEDLEAV | 85.6 | 27.0 | 269 | 369 | 469 | | | |
| ALDRLEAV | 28.3 | 26.5 | 18 | 25 | 32 | | | |
| WR CEDAR | | | 200 | 200 | 200 | | | |
| WH FIR | | | 2,880 | 2,880 | 2,880 | | | |
| BL MAPLE | | | 80 | 80 | 80 | | | |
| SPRUCELV | | | | | | | | |
| MAPLELV | | | | | | | | |
| **TOTAL** | *110.1* | *5.4* | *739* | *780* | *822* | *484* | *121* | *54* |

| CL 68.1 SD: 1.0 | COEFF VAR.% | S.E.% | TREES/ACRE LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 103.0 | 8.0 | 61 | 66 | 71 | | | |
| DOUGLEAV | 153.5 | 11.9 | 29 | 33 | 37 | | | |
| R ALDER | 438.4 | 33.9 | 6 | 9 | 11 | | | |
| SNAG | 379.5 | 29.3 | 5 | 7 | 9 | | | |
| HEMLEAV | 416.6 | 32.2 | 3 | 5 | 6 | | | |
| WHEMLOCK | 576.9 | 44.6 | 2 | 4 | 5 | | | |
| CEDLEAV | 663.9 | 51.3 | 1 | 1 | 2 | | | |
| ALDRLEAV | 933.0 | 72.1 | 0 | 1 | 2 | | | |
| WR CEDAR | 1235.4 | 95.5 | 0 | 0 | 0 | | | |

TC PSTATS

# PROJECT STATISTICS

**PROJECT MULK NEW**



DATE 1/17/2014

| TWP | RGE | SC | TRACT | TYPE | | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 006 | 31 | AREA 4 & 5 | THIN | THR | 362.00 | 167 | 1,186 | 1 | W |
| 06N | 07W | 19 | AREA 6 | R/W | | | | | | |

**TREES/ACRE**

CL 68.1 SD: 1.00

| | COEFF VAR. | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| WH FIR | 1235.4 | 95.5 | 0 | 0 | 0 | | | |
| BL MAPLE | 1235.4 | 95.5 | 0 | 0 | 0 | | | |
| SPRUCELV | 1292.3 | 99.9 | 0 | 0 | 0 | | | |
| MAPLELV | 1292.3 | 99.9 | 0 | 0 | 0 | | | |
| **TOTAL** | *84.4* | *6.5* | *118* | *126* | *134* | *284* | *71* | *32* |

**BASAL AREA/ACRE**

CL 68.1 SD: 1.0

| | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 104.3 | 8.1 | 133 | 144 | 156 | | | |
| DOUGLEAV | 124.8 | 9.6 | 72 | 79 | 87 | | | |
| R ALDER | 428.2 | 33.1 | 7 | 10 | 14 | | | |
| SNAG | 303.4 | 23.5 | 8 | 10 | 12 | | | |
| HEMLEAV | 406.8 | 31.4 | 4 | 6 | 8 | | | |
| WHEMLOCK | 473.9 | 36.6 | 3 | 5 | 7 | | | |
| CEDLEAV | 633.5 | 49.0 | 1 | 3 | 4 | | | |
| ALDRLEAV | 911.0 | 70.4 | 0 | 0 | 1 | | | |
| WR CEDAR | 1235.4 | 95.5 | 0 | 0 | 1 | | | |
| WH FIR | 1235.4 | 95.5 | 0 | 0 | 1 | | | |
| BL MAPLE | 1235.4 | 95.5 | 0 | 0 | 1 | | | |
| SPRUCELV | 1292.3 | 99.9 | 0 | 0 | 0 | | | |
| MAPLELV | 1292.3 | 99.9 | 0 | 0 | 1 | | | |
| **TOTAL** | *67.4* | *5.2* | *247* | *261* | *274* | *181* | *45* | *20* |

**NET BF/ACRE**

CL 68.1 SD: 1.0

| | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 121.4 | 9.4 | 24,149 | 26,650 | 29,152 | | | |
| DOUGLEAV | 122.3 | 9.5 | 12,472 | 13,775 | 15,077 | | | |
| R ALDER | 428.8 | 33.2 | 567 | 848 | 1,129 | | | |
| SNAG | | | | | | | | |
| HEMLEAV | 435.8 | 33.7 | 523 | 789 | 1,055 | | | |
| WHEMLOCK | 457.3 | 35.4 | 421 | 651 | 881 | | | |
| CEDLEAV | 606.9 | 46.9 | 145 | 272 | 400 | | | |
| ALDRLEAV | 911.2 | 70.5 | 7 | 23 | 39 | | | |
| WR CEDAR | 1235.4 | 95.5 | 1 | 18 | 35 | | | |
| WH FIR | 1235.4 | 95.5 | 5 | 120 | 235 | | | |
| BL MAPLE | 1235.4 | 95.5 | 1 | 19 | 37 | | | |
| SPRUCELV | 1292.3 | 99.9 | 0 | 29 | 59 | | | |
| MAPLELV | 1292.3 | 99.9 | 0 | 7 | 14 | | | |
| **TOTAL** | *74.7* | *5.8* | *40,706* | *43,201* | *45,695* | *223* | *56* | *25* |

TC TSTATS

# STATISTICS

**PROJECT MULK NEW**



DATE 1/17/2014

| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 06N | 07W | 19 | AREA 1 & 2 | 00CC | 128.00 | 45 | 344 | 1 | W |

| | PLOTS | TREES | TREES PER PLOT | ESTIMATED TOTAL TREES | PERCENT SAMPLE TREES |
|---|---|---|---|---|---|
| TOTAL | 45 | 344 | 7.6 | | |
| CRUISE | 18 | 112 | 6.2 | 15,959 | .7 |
| DBH COUNT | | | | | |
| REFOREST | | | | | |
| COUNT | 27 | 217 | 8.0 | | |
| 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 | 83 | 77.7 | 24.1 | 99 | | 246.2 | 54,333 | 53,269 | 12,334 | 12,292 |
| R ALDER | 7 | 23.0 | 14.8 | 37 | | 27.6 | 2,387 | 2,290 | 749 | 749 |
| SNAG | 11 | 17.3 | 14.4 | 36 | | 19.6 | | | | |
| WHEMLOCK | 8 | 5.7 | 17.7 | 43 | | 9.8 | 1,184 | 1,173 | 317 | 317 |
| WR CEDAR | 1 | .2 | 26.0 | 70 | | .9 | 125 | 48 | 31 | 13 |
| WH FIR | 1 | .1 | 38.0 | 140 | 0 | .9 | 325 | 325 | 58 | 58 |
| BL MAPLE | 1 | .6 | 16.0 | 37 | | .9 | 51 | 51 | 22 | 22 |
| **TOTAL** | *112* | *124.7* | *21.2* | *76* | | *305.8* | *58,405* | *57,156* | *13,511* | *13,451* |

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

## SAMPLE TREES - BF

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF TREES REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 83.9 | 9.2 | 822 | 905 | 988 | | | |
| R ALDER | 83.3 | 33.9 | 95 | 144 | 193 | | | |
| SNAG | | | | | | | | |
| WHEMLOCK | 75.6 | 28.5 | 275 | 385 | 495 | | | |
| WR CEDAR | | | | | | | | |
| WH FIR | | | | | | | | |
| BL MAPLE | | | | | | | | |
| **TOTAL** | *104.0* | *9.8* | *663* | *736* | *808* | *432* | *108* | *48* |

## TREES/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 46.6 | 6.9 | 72 | 78 | 83 | | | |
| R ALDER | 224.4 | 33.4 | 15 | 23 | 31 | | | |
| SNAG | 211.6 | 31.5 | 12 | 17 | 23 | | | |
| WHEMLOCK | 368.3 | 54.9 | 3 | 6 | 9 | | | |
| WR CEDAR | 670.8 | 99.9 | 0 | 0 | 0 | | | |
| WH FIR | 670.8 | 99.9 | 0 | 0 | 0 | | | |
| BL MAPLE | 670.8 | 99.9 | 0 | 1 | 1 | | | |
| **TOTAL** | *38.4* | *5.7* | *118* | *125* | *132* | *59* | *15* | *7* |

## BASAL AREA/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 44.6 | 6.6 | 230 | 246 | 263 | | | |
| R ALDER | 218.4 | 32.5 | 19 | 28 | 37 | | | |
| SNAG | 193.2 | 28.8 | 14 | 20 | 25 | | | |
| WHEMLOCK | 304.1 | 45.3 | 5 | 10 | 14 | | | |
| WR CEDAR | 670.8 | 99.9 | 0 | 1 | 2 | | | |
| WH FIR | 670.8 | 99.9 | 0 | 1 | 2 | | | |
| BL MAPLE | 670.8 | 99.9 | 0 | 1 | 2 | | | |
| **TOTAL** | *25.3* | *3.8* | *294* | *306* | *317* | *26* | *6* | *3* |

## NET BF/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUG FIR | 44.2 | 6.6 | 49,760 | 53,269 | 56,777 | | | |
| R ALDER | 218.8 | 32.6 | 1,544 | 2,290 | 3,036 | | | |
| SNAG | | | | | | | | |

# STATISTICS

**PROJECT MULK NEW**



| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 06N | 07W | 19 | AREA 1 & 2 | 00CC | 128.00 | 45 | 344 | 1 | W |

CL: 68.1%
SD: 1.0

| | COEFF VAR. | S.E.% | NET BF/ACRE LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| WHEMLOCK | 288.1 | 42.9 | 670 | 1,173 | 1,677 | | | |
| WR CEDAR | 670.8 | 99.9 | 0 | 48 | 96 | | | |
| WH FIR | 670.8 | 99.9 | 0 | 325 | 650 | | | |
| BL MAPLE | 670.8 | 99.9 | 0 | 51 | 102 | | | |
| **TOTAL** | *33.8* | *5.0* | *54,279* | *57,156* | *60,034* | *46* | *11* | *5* |

# STATISTICS

PROJECT MULK NEW



| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 05N | 06W | 32 | AREA3 | P170 | 66.00 | 36 | 262 | 1 | W |

| | PLOTS | TREES | TREES PER PLOT | ESTIMATED TOTAL TREES | PERCENT SAMPLE TREES |
|---|---|---|---|---|---|
| TOTAL | 36 | 262 | 7.3 | | |
| CRUISE | 19 | 120 | 6.3 | 6,741 | 1.8 |
| DBH COUNT | | | | | |
| REFOREST | | | | | |
| COUNT | 17 | 136 | 8.0 | | |
| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 61 | 26.4 | 31.2 | 125 | | 140.0 | 42,342 | 42,109 | 8,346 | 8,346 |
| DOUG FIR | 30 | 41.8 | 20.6 | 91 | | 96.7 | 21,790 | 21,463 | 4,939 | 4,910 |
| HEMLEAV | 7 | 18.4 | 14.1 | 37 | | 20.0 | 2,493 | 2,460 | 646 | 646 |
| SNAG | 8 | 3.7 | 27.8 | 80 | | 15.6 | | | | |
| CEDLEAV | 11 | 6.3 | 21.3 | 59 | | 15.6 | 1,582 | 1,494 | 509 | 496 |
| ALDRLEAV | 2 | 5.2 | 8.8 | 26 | | 2.2 | 125 | 125 | 37 | 37 |
| SPRUCELV | 1 | .4 | 23.0 | 75 | | 1.1 | 162 | 162 | 44 | 44 |
| **TOTAL** | *120* | *102.1* | *22.9* | *84* | | *291.1* | *68,494* | *67,813* | *14,521* | *14,479* |

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 |
| DOUGLEAV | 51.6 | 6.6 | 1,756 | 1,880 | 2,004 | | | |
| DOUG FIR | 66.4 | 12.3 | 654 | 746 | 838 | | | |
| HEMLEAV | 202.9 | 82.6 | 100 | 571 | 1,043 | | | |
| SNAG | | | | | | | | |
| CEDLEAV | 85.6 | 27.0 | 269 | 369 | 469 | | | |
| ALDRLEAV | 28.3 | 26.5 | 18 | 25 | 32 | | | |
| SPRUCELV | | | | | | | | |
| **TOTAL** | *86.9* | *7.9* | *1,117* | *1,213* | *1,310* | *302* | *75* | *34* |

| CL: 68.1 % | COEFF | | TREES/ACRE | | | # OF PLOTS REQ. | | INF. POP. |
|---|---|---|---|---|---|---|---|---|
| SD: 1.0 | VAR.% | S.E.% | LOW | AVG | HIGH | 5 | 10 | 15 |
| DOUGLEAV | 43.8 | 7.3 | 24 | 26 | 28 | | | |
| DOUG FIR | 88.0 | 14.7 | 36 | 42 | 48 | | | |
| HEMLEAV | 181.0 | 30.1 | 13 | 18 | 24 | | | |
| SNAG | 227.5 | 37.9 | 2 | 4 | 5 | | | |
| CEDLEAV | 298.4 | 49.7 | 3 | 6 | 9 | | | |
| ALDRLEAV | 428.7 | 71.4 | 1 | 5 | 9 | | | |
| SPRUCELV | 600.0 | 99.9 | 0 | 0 | 1 | | | |
| **TOTAL** | *49.9* | *8.3* | *94* | *102* | *111* | *99* | *25* | *11* |

| CL: 68.1 % | COEFF | | BASAL AREA/ACRE | | | # OF PLOTS REQ. | | INF. POP. |
|---|---|---|---|---|---|---|---|---|
| SD: 1.0 | VAR.% | S.E.% | LOW | AVG | HIGH | 5 | 10 | 15 |
| DOUGLEAV | 37.1 | 6.2 | 131 | 140 | 149 | | | |
| DOUG FIR | 85.9 | 14.3 | 83 | 97 | 110 | | | |
| HEMLEAV | 175.7 | 29.3 | 14 | 20 | 26 | | | |
| SNAG | 206.4 | 34.4 | 10 | 16 | 21 | | | |
| CEDLEAV | 283.5 | 47.2 | 8 | 16 | 23 | | | |
| ALDRLEAV | 418.2 | 69.6 | 1 | 2 | 4 | | | |
| SPRUCELV | 600.0 | 99.9 | 0 | 1 | 2 | | | |
| **TOTAL** | *30.4* | *5.1* | *276* | *291* | *306* | *37* | *9* | *4* |

| CL: 68.1 % | COEFF | | NET BF/ACRE | | | # OF PLOTS REQ. | | INF. POP. |
|---|---|---|---|---|---|---|---|---|
| SD: 1.0 | VAR.% | S.E.% | LOW | AVG | HIGH | 5 | 10 | 15 |
| DOUGLEAV | 36.4 | 6.1 | 39,558 | 42,109 | 44,661 | | | |
| DOUG FIR | 88.7 | 14.8 | 18,293 | 21,463 | 24,632 | | | |
| HEMLEAV | 208.8 | 34.8 | 1,605 | 2,460 | 3,316 | | | |

# STATISTICS

**PROJECT MULK NEW**



| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 05N | 06W | 32 | AREA3 | P170 | 66.00 | 36 | 262 | 1 | W |

CL: 68.1%
SD: 1.0

| | COEFF VAR. | S.E.% | NET BF/ACRE LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| SNAG | | | | | | | | |
| CEDLEAV | 270.4 | 45.0 | 821 | 1,494 | 2,166 | | | |
| ALDRLEAV | 418.3 | 69.6 | 38 | 125 | 212 | | | |
| SPRUCELV | 600.0 | 99.9 | 0 | 162 | 323 | | | |
| **TOTAL** | *37.7* | *6.3* | *63,557* | *67,813* | *72,068* | *57* | *14* | *6* |

TC TSTATS

# STATISTICS

PROJECT MULK NEW



DATE 1/17/2014

| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 006 | 006 | 31 | AREA 4 & 5 | THIN | 162.00 | 41 | 258 | 1 | W |

| | PLOTS | TREES | TREES PER PLOT | ESTIMATED TOTAL TREES | PERCENT SAMPLE TREES |
|---|---|---|---|---|---|
| TOTAL | 41 | 258 | 6.3 | | |
| CRUISE | 17 | 89 | 5.2 | 22,279 | .4 |
| DBH COUNT | | | | | |
| REFOREST | | | | | |
| COUNT | 24 | 151 | 6.3 | | |
| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 46 | 63.4 | 18.7 | 63 | | 120.5 | 14,130 | 13,624 | 4,057 | 3,999 |
| DOUG FIR | 29 | 66.4 | 14.8 | 46 | | 79.5 | 7,108 | 6,746 | 2,169 | 2,131 |
| HEMLEAV | 7 | 3.1 | 18.3 | 58 | | 5.7 | 793 | 761 | 204 | 204 |
| WHEMLOCK | 5 | 3.5 | 14.6 | 46 | | 4.1 | 502 | 483 | 126 | 126 |
| SNAG | 1 | .8 | 14.0 | 50 | | .8 | | | | |
| MAPLELV | 1 | .2 | 26.0 | 30 | | .8 | 16 | 16 | 13 | 13 |
| **TOTAL** | *89* | *137.5* | *16.8* | *54* | | *211.5* | *22,549* | *21,630* | *6,569* | *6,474* |

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

## SAMPLE TREES - BF

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF TREES REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 91.8 | 13.5 | 230 | 266 | 302 | | | |
| DOUG FIR | 56.1 | 10.6 | 106 | 118 | 131 | | | |
| HEMLEAV | 68.2 | 27.8 | 228 | 316 | 403 | | | |
| WHEMLOCK | 94.7 | 47.1 | 113 | 214 | 315 | | | |
| SNAG | | | | | | | | |
| MAPLELV | | | | | | | | |
| **TOTAL** | *97.0* | *10.3* | *192* | *214* | *236* | *376* | *94* | *42* |

## TREES/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 29.2 | 4.6 | 61 | 63 | 66 | | | |
| DOUG FIR | 65.4 | 10.2 | 60 | 66 | 73 | | | |
| HEMLEAV | 487.5 | 76.1 | 1 | 3 | 6 | | | |
| WHEMLOCK | 490.6 | 76.5 | 1 | 4 | 6 | | | |
| SNAG | 640.3 | 99.9 | 0 | 1 | 2 | | | |
| MAPLELV | 640.3 | 99.9 | 0 | 0 | 0 | | | |
| **TOTAL** | *31.0* | *4.8* | *131* | *138* | *144* | *38* | *10* | *4* |

## BASAL AREA/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 26.4 | 4.1 | 116 | 121 | 125 | | | |
| DOUG FIR | 63.9 | 10.0 | 72 | 80 | 87 | | | |
| HEMLEAV | 390.8 | 61.0 | 2 | 6 | 9 | | | |
| WHEMLOCK | 417.9 | 65.2 | 1 | 4 | 7 | | | |
| SNAG | 640.3 | 99.9 | 0 | 1 | 2 | | | |
| MAPLELV | 640.3 | 99.9 | 0 | 1 | 2 | | | |
| **TOTAL** | *21.4* | *3.3* | *204* | *211* | *219* | *18* | *5* | *2* |

## NET BF/ACRE

| CL: 68.1 % SD: 1.0 | COEFF VAR.% | S.E.% | LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| DOUGLEAV | 28.3 | 4.4 | 13,023 | 13,624 | 14,226 | | | |
| DOUG FIR | 67.4 | 10.5 | 6,036 | 6,746 | 7,456 | | | |
| HEMLEAV | 390.3 | 60.9 | 297 | 761 | 1,224 | | | |
| WHEMLOCK | 414.5 | 64.7 | 171 | 483 | 796 | | | |

# STATISTICS

**PROJECT MULK NEW**



| TWP | RGE | SECT | TRACT | TYPE | ACRES | PLOTS | TREES | CuFt | BdFt |
|---|---|---|---|---|---|---|---|---|---|
| 006 | 006 | 31 | AREA 4 & 5 | THIN | 162.00 | 41 | 258 | 1 | W |

CL: 68.1%
SD: 1.0

| | COEFF VAR. | S.E.% | NET BF/ACRE LOW | AVG | HIGH | # OF PLOTS REQ. 5 | 10 | INF. POP. 15 |
|---|---|---|---|---|---|---|---|---|
| SNAG | | | | | | | | |
| MAPLELV | 640.3 | 99.9 | 0 | 16 | 31 | | | |
| **TOTAL** | *25.1* | *3.9* | *20,784* | *21,630* | *22,476* | *25* | *6* | *3* |

TC PLOGSTVB

# Log Stock Table - MBF

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

**Project:** MULK_NEW
**Acres** 362.00


**Date** 1/17/2014
**Time** 12:57:41PM

| Spp | S T | So | Gr | 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+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | CU | 6 | 35 | 100.0 | | | | | | | | | | | | | | |
| D | | DO | CU | 16 | 11 | 100.0 | | | | | | | | | | | | | | |
| D | | DO | CU | 40 | 15 | 100.0 | | | | | | | | | | | | | | |
| D | | DO | 2S | 26 | 40 | | 40 | .4 | | | | | | 40 | | | | | | |
| D | | DO | 2S | 32 | 975 | 2.6 | 949 | 9.8 | | | | 7 | 149 | 200 | 146 | 247 | 199 | | | |
| D | | DO | 2S | 34 | 62 | | 62 | .6 | | | | | | | | | 62 | | | |
| D | | DO | 2S | 36 | 46 | 2.8 | 44 | .5 | | | | | | | | 44 | | | | |
| D | | DO | 2S | 40 | 6,610 | 1.3 | 6,522 | 67.6 | | | | | 165 | 1028 | 803 | 2806 | 1240 | 287 | 194 | |
| D | | DO | 3S | 15 | 1 | | 1 | .0 | | | | 1 | | | | | | | | |
| D | | DO | 3S | 17 | 18 | | 18 | .2 | | | 2 | 8 | 2 | | | 5 | | | | |
| D | | DO | 3S | 18 | 5 | | 5 | .1 | | | | | 5 | | | | | | | |
| D | | DO | 3S | 20 | 34 | | 34 | .3 | | | | 4 | 16 | 14 | | | | | | |
| D | | DO | 3S | 22 | 40 | | 40 | .4 | | | 18 | 11 | | 11 | | | | | | |
| D | | DO | 3S | 23 | 8 | | 8 | .1 | | | 4 | 5 | | | | | | | | |
| D | | DO | 3S | 24 | 32 | | 32 | .3 | | | | | 32 | | | | | | | |
| D | | DO | 3S | 25 | 31 | | 31 | .3 | | | 11 | 3 | | | | | 18 | | | |
| D | | DO | 3S | 26 | 7 | | 7 | .1 | | | | | | | 7 | | | | | |
| D | | DO | 3S | 27 | 44 | | 44 | .5 | | | 3 | 32 | 8 | | | | | | | |
| D | | DO | 3S | 28 | 10 | | 10 | .1 | | | 10 | | | | | | | | | |
| D | | DO | 3S | 29 | 5 | | 5 | .1 | | | | 5 | | | | | | | | |
| D | | DO | 3S | 31 | 13 | 25.0 | 10 | .1 | | | 10 | | | | | | | | | |
| D | | DO | 3S | 32 | 499 | 3.8 | 480 | 5.0 | | | 75 | 102 | 267 | 36 | | | | | | |
| D | | DO | 3S | 33 | 64 | 3.1 | 62 | .6 | | | 34 | 9 | 19 | | | | | | | |
| D | | DO | 3S | 34 | 41 | | 41 | .4 | | | 32 | 9 | | | | | | | | |
| D | | DO | 3S | 35 | 19 | | 19 | .2 | | | | 19 | | | | | | | | |
| D | | DO | 3S | 36 | 59 | 9.5 | 54 | .6 | | | 28 | 25 | | | | | | | | |
| D | | DO | 3S | 37 | 56 | | 56 | .6 | | | 5 | 51 | | | | | | | | |
| D | | DO | 3S | 38 | 48 | | 48 | .5 | | | 48 | | | | | | | | | |
| D | | DO | 3S | 39 | 39 | | 39 | .4 | | | | 28 | 11 | | | | | | | |
| D | | DO | 3S | 40 | 645 | | 640 | 6.6 | | 6 | 181 | 147 | 195 | 64 | 47 | | | | | |
| D | | DO | 3S | 41 | 43 | | 43 | .5 | | | | 28 | 15 | | | | | | | |
| D | | DO | 3S | 44 | 14 | | 14 | .1 | | | 14 | | | | | | | | | |
| D | | DO | 4S | 11 | 3 | | 3 | .0 | | | 3 | | | | | | | | | |
| D | | DO | 4S | 16 | 28 | | 28 | .3 | | | 28 | | | | | | | | | |
| D | | DO | 4S | 17 | 16 | | 16 | .2 | | 1 | 7 | 8 | | | | | | | | |
| D | | DO | 4S | 18 | 12 | 33.3 | 8 | .1 | | | | 8 | | | | | | | | |

TC PLOGSTVB

# Log Stock Table - MBF

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

**Project:** MULK_NEW
**Acres** 362.00


**Date** 1/17/2014
**Time** 12:57:41PM

| Spp | S T | So rt | Gr 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+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | DO | 4S | 21 | 21 | | 21 | .2 | | | 21 | | | | | | | | | |
| D | | DO | 4S | 22 | 14 | | 14 | .2 | | | 6 | 9 | | | | | | | | |
| D | | DO | 4S | 23 | 25 | | 25 | .3 | | | 25 | | | | | | | | | |
| D | | DO | 4S | 25 | 3 | | 3 | .0 | | | 3 | | | | | | | | | |
| D | | DO | 4S | 26 | 28 | 20.0 | 23 | .2 | | | | 23 | | | | | | | | |
| D | | DO | 4S | 27 | 32 | | 32 | .3 | | | 32 | | | | | | | | | |
| D | | DO | 4S | 29 | 11 | | 11 | .1 | | | 11 | | | | | | | | | |
| D | | DO | 4S | 30 | 7 | | 7 | .1 | | | 7 | | | | | | | | | |
| D | | DO | 4S | 31 | 31 | 8.0 | 29 | .3 | | | 29 | | | | | | | | | |
| D | | DO | 4S | 32 | 19 | | 19 | .2 | | | | 19 | | | | | | | | |
| D | | DO | 4S | 38 | 13 | | 13 | .1 | | | 13 | | | | | | | | | |
| D | | DO | 4S | 41 | 35 | | 35 | .4 | | 14 | 22 | | | | | | | | | |
| D | | Totals | | | 9,870 | 2.3 | 9,647 | 94.2 | | 20 | 683 | 562 | 883 | 1392 | 1004 | 3103 | 1518 | 287 | 194 | |
| H | | DO | 2S | 32 | 50 | 6.8 | 46 | 19.7 | | | | | 15 | | | | 32 | | | |
| H | | DO | 2S | 40 | 86 | | 86 | 36.3 | | | | | | | 20 | 66 | | | | |
| H | | DO | 3S | 17 | 6 | | 6 | 2.7 | | | 6 | | | | | | | | | |
| H | | DO | 3S | 18 | 6 | | 6 | 2.7 | | | 6 | | | | | | | | | |
| H | | DO | 3S | 24 | 3 | | 3 | 1.2 | | | | | 3 | | | | | | | |
| H | | DO | 3S | 26 | 2 | 11.1 | 2 | .8 | | | | | 2 | | | | | | | |
| H | | DO | 3S | 32 | 28 | | 28 | 11.9 | | | | 13 | 15 | | | | | | | |
| H | | DO | 3S | 36 | 4 | | 4 | 1.7 | | | | 4 | | | | | | | | |
| H | | DO | 3S | 38 | 5 | | 5 | 2.0 | | | 5 | | | | | | | | | |
| H | | DO | 3S | 39 | 19 | | 19 | 7.9 | | | | | 19 | | | | | | | |
| H | | DO | 3S | 40 | 6 | | 6 | 2.4 | | | | 6 | | | | | | | | |
| H | | DO | 4S | 16 | 3 | | 3 | 1.2 | | | 3 | | | | | | | | | |
| H | | DO | 4S | 21 | 3 | | 3 | 1.4 | | | 3 | | | | | | | | | |
| H | | DO | 4S | 24 | 3 | | 3 | 1.3 | | | 3 | | | | | | | | | |
| H | | DO | 4S | 32 | 12 | | 12 | 5.0 | | | | 12 | | | | | | | | |
| H | | DO | 4S | 38 | 4 | | 4 | 1.7 | | | 4 | | | | | | | | | |
| H | | Totals | | | 240 | 1.9 | 236 | 2.3 | | | 30 | 35 | 53 | | 20 | 66 | 32 | | | |
| A | | DO | CR | 16 | 29 | 33.3 | 19 | 6.3 | | | | 19 | | | | | | | | |
| A | | DO | CR | 17 | 17 | | 17 | 5.6 | | | 17 | | | | | | | | | |
| A | | DO | CR | 18 | 10 | | 10 | 3.3 | | | | 10 | | | | | | | | |
| A | | DO | CR | 22 | 8 | | 8 | 2.6 | | | | 8 | | | | | | | | |
| A | | DO | CR | 30 | 23 | | 23 | 7.4 | | | | 23 | | | | | | | | |
| A | | DO | CR | 33 | 15 | | 15 | 4.9 | | | 15 | | | | | | | | | |

TC PLOGSTVB

# Log Stock Table - MBF

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

**Project:** MULK_NEW
**Acres** 362.00


**Date** 1/17/2014
**Time** 12:57:41PM

| Spp | ST | Sort | Grade | 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 | CR | 40 | 218 | 1.5 | 215 | 70.0 | | | | 37 | 60 | 60 | 58 | | | | | |
| A | | Totals | | | 320 | 4.1 | 307 | 3.0 | | | 32 | 97 | 60 | 60 | 58 | | | | | |
| WF | | DO | 2S | 40 | 42 | | 42 | 97.2 | | | | | | | | 6 | 14 | 22 | | |
| WF | | DO | 3S | 16 | 1 | | 1 | 2.8 | | | | | | 1 | | | | | | |
| WF | | Totals | | | 44 | | 44 | .4 | | | | | | 1 | | 6 | 14 | 22 | | |
| M | | DO | CR | 36 | 7 | | 7 | 100.0 | | | | 7 | | | | | | | | |
| M | | Totals | | | 7 | | 7 | .1 | | | | 7 | | | | | | | | |
| C | | DO | CU | 24 | 0 | 100.0 | | | | | | | | | | | | | | |
| C | | DO | 3S | 22 | 0 | | 0 | 100.0 | | | | 0 | | | 0 | | | | | |
| C | | Totals | | | 1 | 61.5 | 0 | .0 | | | | 0 | | | 0 | | | | | |
| Total | | All Species | | | 10,481 | 2.3 | 10,240 | 100.0 | | 20 | 746 | 701 | 997 | 1453 | 1082 | 3175 | 1564 | 309 | 194 | |

TC PSTNDSUM

# Stand Table Summary

Page 1
Date: 1/21/2014

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

Project MULK_NEW
Acres 362.00

Time: 9:59:58AM
Grown Year:

| Spc | S T | DBH | Sample Trees | FF 16' | Tot Av Ht | Trees/ Acre | BA/ Acre | Logs Acre | Average Log Net Cu.Ft. | Average Log Net Bd.Ft. | Tons/ Acre | Net Cu.Ft. Acre | Net Bd.Ft. Acre | Totals Tons | Totals Cunits | Totals MBF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | | 11 | 1 | 83 | 59 | 1.859 | 1.23 | 1.86 | 14.0 | 50.0 | | 26 | 93 | | 94 | 34 |
| D | | 12 | 4 | 85 | 56 | 4.621 | 3.63 | 4.62 | 17.7 | 51.5 | | 82 | 238 | | 295 | 86 |
| D | | 13 | 9 | 87 | 66 | 10.510 | 9.69 | 11.84 | 20.5 | 61.1 | | 243 | 724 | | 880 | 262 |
| D | | 14 | 3 | 87 | 46 | 3.444 | 3.68 | 4.59 | 16.2 | 45.0 | | 75 | 207 | | 270 | 75 |
| D | | 15 | 4 | 86 | 87 | 1.852 | 2.27 | 3.23 | 22.6 | 75.7 | | 73 | 244 | | 264 | 88 |
| D | | 16 | 7 | 86 | 78 | 4.722 | 6.59 | 7.69 | 26.0 | 89.0 | | 200 | 684 | | 725 | 248 |
| D | | 17 | 6 | 78 | 100 | 3.811 | 6.01 | 7.54 | 26.6 | 86.4 | | 201 | 651 | | 726 | 236 |
| D | | 18 | 15 | 87 | 94 | 6.984 | 12.34 | 14.23 | 31.2 | 111.2 | | 444 | 1,583 | | 1,606 | 573 |
| D | | 19 | 8 | 87 | 100 | 2.595 | 5.11 | 6.05 | 33.9 | 125.6 | | 205 | 759 | | 742 | 275 |
| D | | 20 | 4 | 85 | 86 | 1.335 | 2.91 | 2.67 | 37.2 | 114.4 | | 99 | 305 | | 360 | 111 |
| D | | 21 | 3 | 86 | 140 | .733 | 1.76 | 2.20 | 41.9 | 170.0 | | 92 | 374 | | 333 | 135 |
| D | | 22 | 7 | 87 | 135 | 1.470 | 3.88 | 4.86 | 40.6 | 167.2 | | 197 | 812 | | 715 | 294 |
| D | | 23 | 19 | 86 | 121 | 3.629 | 10.47 | 9.75 | 49.7 | 198.9 | | 484 | 1,938 | | 1,752 | 702 |
| D | | 24 | 20 | 87 | 139 | 3.544 | 11.13 | 10.63 | 53.9 | 224.8 | | 573 | 2,391 | | 2,076 | 865 |
| D | | 25 | 21 | 87 | 139 | 3.439 | 11.72 | 10.17 | 59.6 | 253.8 | | 606 | 2,580 | | 2,195 | 934 |
| D | | 26 | 22 | 87 | 141 | 3.297 | 12.16 | 9.89 | 65.4 | 278.9 | | 646 | 2,758 | | 2,340 | 999 |
| D | | 27 | 14 | 86 | 153 | 1.953 | 7.76 | 6.28 | 68.6 | 309.7 | | 431 | 1,945 | | 1,561 | 704 |
| D | | 28 | 21 | 88 | 142 | 2.705 | 11.57 | 7.86 | 78.0 | 369.5 | | 613 | 2,904 | | 2,219 | 1,051 |
| D | | 29 | 6 | 88 | 156 | .718 | 3.29 | 1.92 | 92.9 | 457.5 | | 178 | 876 | | 644 | 317 |
| D | | 30 | 10 | 86 | 141 | 1.134 | 5.57 | 3.40 | 85.6 | 391.7 | | 291 | 1,333 | | 1,054 | 483 |
| D | | 31 | 2 | 83 | 149 | .210 | 1.10 | .63 | 91.7 | 403.3 | | 58 | 254 | | 209 | 92 |
| D | | 32 | 8 | 85 | 143 | .786 | 4.39 | 2.36 | 94.9 | 450.0 | | 224 | 1,062 | | 811 | 384 |
| D | | 33 | 2 | 88 | 146 | .185 | 1.10 | .55 | 111.0 | 560.0 | | 62 | 311 | | 223 | 112 |
| D | | 34 | 2 | 89 | 117 | .174 | 1.10 | .52 | 99.0 | 486.7 | | 52 | 254 | | 187 | 92 |
| D | | 36 | 1 | 89 | 169 | .083 | .59 | .33 | 108.0 | 590.0 | | 36 | 196 | | 130 | 71 |
| D | | 39 | 2 | 89 | 166 | .132 | 1.10 | .40 | 169.0 | 903.3 | | 67 | 359 | | 243 | 130 |
| D | | 44 | 2 | 89 | 173 | .104 | 1.10 | .42 | 168.5 | 967.5 | | 70 | 402 | | 254 | 146 |
| D | | 53 | 2 | 88 | 179 | .072 | 1.10 | .29 | 248.8 | 1445.0 | | 71 | 414 | | 258 | 150 |
| D | | Totals | 225 | 86 | 99 | 66.102 | 144.35 | 136.76 | 46.8 | 194.9 | | 6,399 | 26,650 | | 23,165 | 9,647 |
| A | | 10 | 2 | 86 | 27 | 2.672 | 1.46 | 2.67 | 8.0 | 20.0 | | 21 | 53 | | 77 | 19 |
| A | | 13 | 2 | 85 | 19 | 1.581 | 1.46 | 1.58 | 10.0 | 30.0 | | 16 | 47 | | 57 | 17 |
| A | | 16 | 2 | 86 | 42 | 1.044 | 1.46 | 1.04 | 26.0 | 60.0 | | 27 | 63 | | 98 | 23 |
| A | | 17 | 4 | 86 | 73 | 1.849 | 2.91 | 2.77 | 34.3 | 106.7 | | 95 | 296 | | 345 | 107 |
| A | | 18 | 2 | 83 | 96 | .825 | 1.46 | 1.65 | 39.0 | 125.0 | | 64 | 206 | | 233 | 75 |
| A | | 22 | 2 | 87 | 81 | .552 | 1.46 | 1.10 | 48.5 | 165.0 | | 54 | 182 | | 194 | 66 |
| A | | Totals | 14 | 86 | 48 | 8.522 | 10.20 | 10.82 | 25.6 | 78.3 | | 277 | 848 | | 1,004 | 307 |
| H | | 12 | 5 | 88 | 31 | 1.619 | 1.27 | 1.62 | 12.2 | 41.5 | | 20 | 67 | | 72 | 24 |
| H | | 13 | 1 | 92 | 69 | .398 | .37 | .80 | 14.5 | 55.0 | | 12 | 44 | | 42 | 16 |
| H | | 14 | 1 | 86 | 78 | .343 | .37 | .34 | 35.0 | 150.0 | | 12 | 51 | | 43 | 19 |
| H | | 15 | 1 | 92 | 71 | .299 | .37 | .60 | 20.5 | 85.0 | | 12 | 51 | | 44 | 18 |
| H | | 17 | 2 | 86 | 73 | .287 | .45 | .57 | 25.5 | 85.0 | | 15 | 49 | | 53 | 18 |
| H | | 21 | 2 | 85 | 97 | .188 | .45 | .38 | 51.5 | 180.0 | | 19 | 68 | | 70 | 25 |
| H | | 23 | 2 | 89 | 97 | .157 | .45 | .31 | 62.5 | 235.0 | | 20 | 74 | | 71 | 27 |
| H | | 25 | 2 | 85 | 103 | .133 | .45 | .27 | 74.5 | 290.0 | | 20 | 77 | | 72 | 28 |
| H | | 27 | 2 | 85 | 94 | .114 | .45 | .23 | 82.0 | 305.0 | | 19 | 69 | | 68 | 25 |
| H | | 32 | 1 | 82 | 71 | .066 | .37 | .13 | 90.0 | 285.0 | | 12 | 37 | | 43 | 14 |
| H | | 33 | 2 | 88 | 69 | .076 | .45 | .15 | 94.0 | 415.0 | | 14 | 63 | | 52 | 23 |
| H | | Totals | 21 | 88 | 58 | 3.680 | 5.45 | 5.40 | 32.2 | 120.6 | | 174 | 651 | | 629 | 236 |
| WF | | 38 | 2 | 89 | 173 | .042 | .33 | .17 | 128.5 | 720.0 | | 21 | 120 | | 78 | 44 |
| WF | | Totals | 2 | 89 | 173 | .042 | .33 | .17 | 128.5 | 720.0 | | 21 | 120 | | 78 | 44 |

TC PSTNDSUM

# Stand Table Summary

Page 2
Date: 1/21/2014

T006 R006 S31 TyTAKE
THRU
T06N R07W S19 TyR/W

Project MULK_NEW
Acres 362.00

Time: 9:59:58AM
Grown Year:

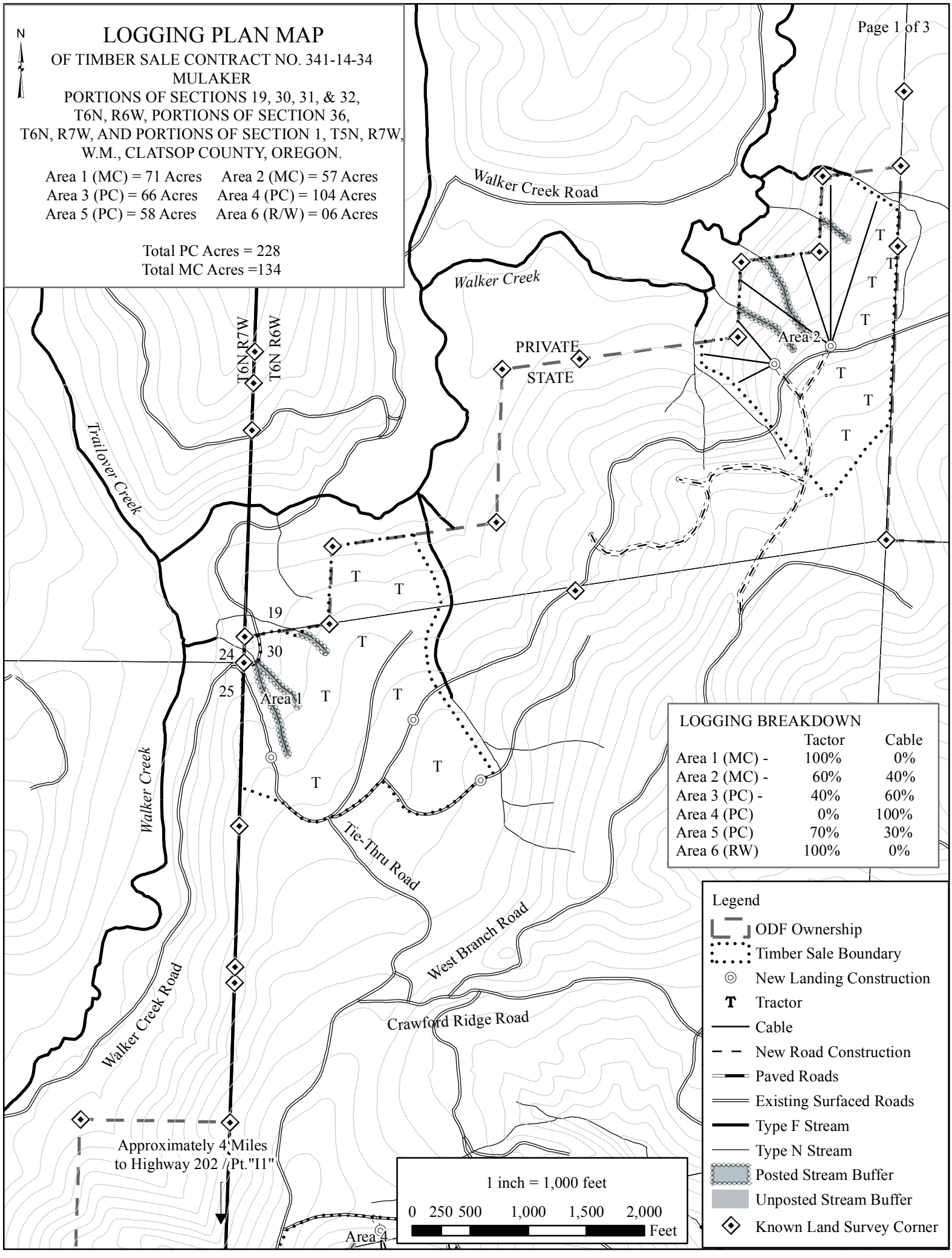
| Spc | S T | DBH | Sample Trees | FF 16' | Tot Av Ht | Trees/ Acre | BA/ Acre | Logs Acre | Average Log Net Cu.Ft. | Average Log Net Bd.Ft. | Tons/ Acre | Net Cu.Ft. Acre | Net Bd.Ft. Acre | Totals Tons | Totals Cunits | Totals MBF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | | 16 | 2 | 86 | 53 | .236 | .33 | .24 | 34.0 | 80.0 | | 8 | 19 | | 29 | 7 |
| M | | Totals | 2 | 86 | 53 | .236 | .33 | .24 | 34.0 | 80.0 | | 8 | 19 | | 29 | 7 |
| C | | 26 | 1 | 81 | 93 | .004 | .01 | .01 | 26.5 | 100.0 | | 0 | 1 | | 1 | 0 |
| C | | Totals | 1 | 81 | 93 | .004 | .01 | .01 | 26.5 | 100.0 | | 0 | 1 | | 1 | 0 |
| Totals | | | 265 | 86 | 91 | 78.584 | 160.68 | 153.39 | 44.9 | 184.4 | | 6,880 | 28,289 | | 24,906 | 10,240 |

# LOGGING PLAN MAP

OF TIMBER SALE CONTRACT NO. 341-14-34
MULAKER
PORTIONS OF SECTIONS 19, 30, 31, & 32,
T6N, R6W, PORTIONS OF SECTION 36,
T6N, R7W, AND PORTIONS OF SECTION 1, T5N, R7W,
W.M., CLATSOP COUNTY, OREGON.

Area 1 (MC) = 71 Acres  Area 2 (MC) = 57 Acres
Area 3 (PC) = 66 Acres  Area 4 (PC) = 104 Acres
Area 5 (PC) = 58 Acres  Area 6 (R/W) = 06 Acres

Total PC Acres = 228
Total MC Acres =134




LOGGING BREAKDOWN

| | Tactor | Cable |
|---|---|---|
| Area 1 (MC) - | 100% | 0% |
| Area 2 (MC) - | 60% | 40% |
| Area 3 (PC) - | 40% | 60% |
| Area 4 (PC) | 0% | 100% |
| Area 5 (PC) | 70% | 30% |
| Area 6 (RW) | 100% | 0% |

Legend
- ODF Ownership
- Timber Sale Boundary
- New Landing Construction
- T Tractor
- Cable
- New Road Construction
- Paved Roads
- Existing Surfaced Roads
- Type F Stream
- Type N Stream
- Posted Stream Buffer
- Unposted Stream Buffer
- Known Land Survey Corner

1 inch = 1,000 feet
0 250 500 1,000 1,500 2,000 Feet

# LOGGING PLAN MAP

OF TIMBER SALE CONTRACT NO. 341-14-34
MULAKER
PORTIONS OF SECTIONS 19, 30, 31, & 32,
T6N, R6W, PORTIONS OF SECTIONS 25 & 36,
T6N, R7W, AND PORTIONS OF SECTION 1, T5N, R7W,
W.M., CLATSOP COUNTY, OREGON.

Area 1 (MC) = 71 Acres  Area 2 (MC) = 57 Acres
Area 3 (PC) = 66 Acres  Area 4 (PC) = 104 Acres
Area 5 (PC) = 58 Acres  Area 6 (R/W) = 06 Acres

Total PC Acres = 228
Total MC Acres =134

LOGGING BREAKDOWN

| | Tactor | Cable |
|---|---|---|
| Area 1 (MC) - | 100% | 0% |
| Area 2 (MC) - | 60% | 40% |
| Area 3 (PC) - | 40% | 60% |
| Area 4 (PC) | 0% | 100% |
| Area 5 (PC) | 70% | 30% |
| Area 6 (RW) | 100% | 0% |

Approximately 1.5 miles
to Crawford Ridge Road / Pt."I2"

29 28
32 33

T
T
T
T
T
T
T

**Area 3**

PRIVATE
STATE
STATE
PRIVATE

*Mulak Creek*
*West Branch Mulak Creek*
West Branch Road
*Nehalem River*
Highway 202

T6N R6W
T5N R6W
32 33
5 4

1 inch = 1,000 feet
0 250 500 1,000 1,500 2,000 Feet

Legend
- ODF Ownership
- Timber Sale Boundary
- New Landing Construction
- T Tractor
- Cable
- New Road Construction
- Paved Roads
- Existing Surfaced Roads
- Type F Stream
- Type N Stream
- Posted Stream Buffer
- Unposted Stream Buffer
- Known Land Survey Corner
- Gate

# LOGGING PLAN MAP

OF TIMBER SALE CONTRACT NO. 341-14-34
MULAKER
PORTIONS OF SECTIONS 19, 30, 31, & 32,
T6N, R6W, PORTIONS OF SECTIONS 25 & 36,
T6N, R7W, AND PORTIONS OF SECTION 1, T5N, R7W,
W.M., CLATSOP COUNTY, OREGON.

Area 1 (MC) = 71Acres  Area 2 (MC) = 57 Acres
Area 2 (PC) = 66 Acres  Area 4 (PC) = 104 Acres
Area 5 (PC) = 58 Acres  Area 6 (R/W) = 06 Acres

Total PC Acres = 228
Total MC Acres = 134

LOGGING BREAKDOWN

| | Tactor | Cable |
|---|---|---|
| Area 1 (MC) - | 100% | 0% |
| Area 2 (MC) - | 60% | 40% |
| Area 3 (PC) - | 40% | 60% |
| Area 4 (PC) | 0% | 100% |
| Area 5 (PC) | 70% | 30% |
| Area 6 (RW) | 100% | 0% |