



Oregon

Theodore R. Kulongoski, Governor

Department of Land Conservation and Development

635 Capitol Street, Suite 150

Salem, OR 97301-2540

(503) 373-0050

Fax (503) 378-5518

www.lcd.state.or.us



NOTICE OF ADOPTED AMENDMENT

07/16/2012

TO: Subscribers to Notice of Adopted Plan
or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: Linn County Plan Amendment
DLCD File Number 001-12

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Thursday, August 02, 2012

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Deborah Pinkerton, Linn County
Jon Jinings, DLCD Community Services Specialist
Katherine Daniels, DLCD Farm/Forest Specialist
Ed Moore, DLCD Regional Representative

<paa> Y



FORM 2

DLCD

Notice of Adoption

This Form 2 must be mailed to DLCD within **5-Working Days after the Final Ordinance is signed** by the public Official Designated by the jurisdiction and all other requirements of ORS 197.615 and OAR 660-018-000

In person electronic mailed

DATE
STAMP

DEPT OF
JUL 13 2012
LAND CONSERVATION
AND DEVELOPMENT
For Office Use Only

Jurisdiction: **Linn County**

Local file number: **BC12-0001**

Date of Adoption: **7/11/2012**

Date Mailed: **7/12/2012**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? Yes No Date: 2/22/2012

Comprehensive Plan Text Amendment

Comprehensive Plan Map Amendment

Land Use Regulation Amendment

Zoning Map Amendment

New Land Use Regulation

Other:

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

The Linn County Board of Commissioners amended the Linn County Comprehensive Plan map from Farm/Forest to Non-Resource and amended the Linn County Zoning map from Farm/Forest (F/F) to Non-Resource-5 acre minimum (NR-5) on 15.25 acres identified as Tax Lot 903 on map T12S, R1W, Section 7.

Does the Adoption differ from proposal? No, no explanation is necessary

Plan Map Changed from: **Farm/Forest**

to: **Non-Resource**

Zone Map Changed from: **Farm/Forest (F/F)**

to: **Non-Resource-5 acre minimum (NR-5)**

Location: **T12S, R1W, Section 7, Tax Lot 903**

Acres Involved: **15**

Specify Density: Previous: **80 acres**

New: **5 acres**

Applicable statewide planning goals:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Was an Exception Adopted? YES NO

Did DLCD receive a Notice of Proposed Amendment...

35-days prior to first evidentiary hearing?

Yes No

If no, do the statewide planning goals apply?

Yes No

If no, did Emergency Circumstances require immediate adoption?

Yes No

DLCD file No. 001-12 (19200) [17104]

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

Dept. of Forestry

Local Contact: **Deborah Pinkerton**

Phone: (541) 967-3816 Extension: 2367

Address: P O Box 100

Fax Number: 541-926-2060

City: Albany

Zip: 97321-

E-mail Address: dpinkerton@co.linn.or.us

ADOPTION SUBMITTAL REQUIREMENTS

This Form 2 must be received by DLCD no later than 5 working days after the ordinance has been signed by the public official designated by the jurisdiction to sign the approved ordinance(s) per ORS 197.615 and OAR Chapter 660, Division 18

1. This Form 2 must be submitted by local jurisdictions only (not by applicant).
2. When submitting the adopted amendment, please print a completed copy of Form 2 on light **green paper if available**.
3. Send this Form 2 and one complete paper copy (documents and maps) of the adopted amendment to the address below.
4. Submittal of this Notice of Adoption must include the final signed ordinance(s), all supporting finding(s), exhibit(s) and any other supplementary information ([ORS 197.615](#)).
5. Deadline to appeals to LUBA is calculated **twenty-one (21) days** from the receipt (postmark date) by DLCD of the adoption ([ORS 197.830 to 197.845](#)).
6. In addition to sending the Form 2 - Notice of Adoption to DLCD, please also remember to notify persons who participated in the local hearing and requested notice of the final decision. ([ORS 197.615](#)).
7. Submit **one complete paper copy** via United States Postal Service, Common Carrier or Hand Carried to the DLCD Salem Office and stamped with the incoming date stamp.
8. Please mail the adopted amendment packet to:

**ATTENTION: PLAN AMENDMENT SPECIALIST
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
635 CAPITOL STREET NE, SUITE 150
SALEM, OREGON 97301-2540**

9. **Need More Copies?** Please print forms on **8½ -1/2x11 green paper only if available**. If you have any questions or would like assistance, please contact your DLCD regional representative or contact the DLCD Salem Office at (503) 373-0050 x238 or e-mail plan.amendments@state.or.us.

<http://www.oregon.gov/LCD/forms.shtml>

Updated December 30, 2011



LINN COUNTY PLANNING AND BUILDING DEPARTMENT

Robert Wheeldon, Director

Room 114, Linn County Courthouse
PO Box 100, Albany, Oregon 97321
Phone 541-967-3816 Fax 541-926-2060
www.co.linn.or.us

NOTICE OF FINAL DECISION

CASE BC12-0001

APPLICANT Carol Cromwell

**RESOLUTION/
ORDER** 2012-181

ORDINANCE 2012-182

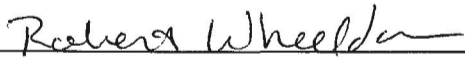
REQUEST The applicant proposed to amend the *Comprehensive Plan* map designation from Farm/Forest to Non-Resource and amend the zoning map designation from Farm/Forest (F/F) to Non-Resource-5 acre minimum (NR-5) on 15.25 acres identified as Tax Lot 903 on map T12S, R1W, Section 7.

BOARD OF COMMISSIONERS ACTION The Linn County Board of Commissioners unanimously approved the requested *Comprehensive Plan* map amendment and zoning map amendment.

If you wish to appeal this decision, an appeal must be filed with the Land Use Board of Appeals (LUBA) within 21 days from the date this notice is mailed.

Appeals to LUBA must be filed in accordance with ORS 197.830. If you have any questions about this process, you should contact LUBA in Salem.

Ordinance No. 2012-182 and Resolution and Order No. 2012-181 may be reviewed at the office of the Linn County Clerk, Room 205, Linn County Courthouse; that office is open from 8:30 a.m. to 5:00 p.m., Monday through Friday, except legal holidays. A copy of the ordinance and resolution and order is available in the office of the Linn County Clerk. A fee to cover copying costs will be charged.



Robert Wheeldon
Director

7/12/12

Date

C: Linn County Assessor's Office, Linn County GIS, Linn County Road Department, Department of Land Conservation and Development, Rich Catlin (Reece & Associates), Marc Setchko

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR LINN COUNTY

IN THE MATTER OF AN ORDINANCE AMENDING)
THE LINN COUNTY COMPREHENSIVE PLAN MAP)
AND THE LINN COUNTY ZONING MAP)

ORDINANCE NO. 2012-182
(Amending Code)
(Planning and Building
Department; BC12-0001)

WHEREAS, The Linn County Board of Commissioners (Board) advertised notice that it would consider a proposed amendment to the Linn County *Comprehensive Plan* map and the Linn County zoning map on June 27, 2012;

WHEREAS, At 10:00 a.m., on June 27, 2012, the Board conducted a regularly scheduled and duly advertised public hearing, considered the proposed amendment for the *Comprehensive Plan* map and zoning map;

WHEREAS, The Board having read the proposed ordinance and having received and considered the oral and written public testimony presented prior to and at the hearing; and

WHEREAS, The findings in support of this ordinance are attached to Resolution and Order No. 2012-181 and entitled Exhibit 1, (BC12-0001 Decision Criteria, Findings and Conclusions); and, now, therefore, be it

Ordained by the Linn County Board of Commissioners, That:

Section 1. Map Amendment. LCC 900.900, *Comprehensive Plan* map, be amended to designate the 15.25 acres, identified as Tax Lot 903 on Assessor map T12S, R1W, Section 7, Linn County, Oregon, as Non Resource on the Linn County *Comprehensive Plan* map.

Section 2. Map Amendment. Appendix 1, Zoning map, following LCC Chapter 920 [see LCC 920.010(B)] be amended to designate the 15.25 acres identified as Tax Lot 903 on Assessor map T12S, R1W, Section 7, Linn County, Oregon, Non-Resource-5 acre minimum (NR-5) on the Linn County zoning map.

Section 3. Savings clause. Repeal of a code section or ordinance shall not revive a code section or ordinance in force before or at the time the repealed code section or ordinance took effect. The repeal shall not affect a punishment or penalty incurred before the repeal took effect, nor a suit, prosecution, or proceeding pending at the time of the repeal for an offense committed under the repealed code section or ordinance.

Section 4. Severability. Invalidity of a section or part of a section of this ordinance shall not affect the validity of the remaining sections or parts of sections.

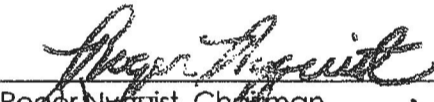

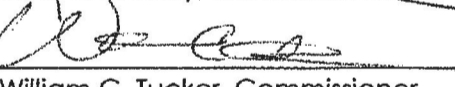
Section 5. Effective date. To protect the health, safety, and welfare of the citizens of Linn County, this ordinance shall take effect following adoption.

Section 6. Codification. Following adoption, this ordinance shall be codified pursuant to LCC Chapter 120.

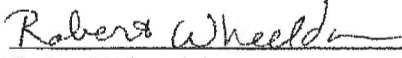
Public reading held ^{June} July 27, 2012.
 Adopted and passed July 11, 2012.
 The effective date of this Ordinance shall be July 11, 2012.

BOARD OF COUNTY COMMISSIONERS FOR LINN COUNTY

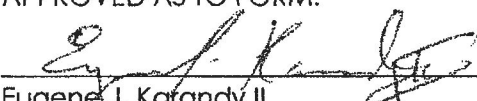
Signed July 11, 2012

		Voting	
		For	Against
		X	
Steve Druckenmiller, Linn County Clerk Recording Secretary	Roger Nyquist, Chairman		
		X	
	John K. Lindsey, Commissioner		
By _____		X	
	William C. Tucker, Commissioner		

APPROVED AS TO CONTENT:


 Robert Wheeldon
 Linn County Planning and Building Director

APPROVED AS TO FORM:


 Eugene J. Karandy II
 County Attorney for Linn County

BEFORE THE BOARD OF COUNTY COMMISSIONERS

FOR LINN COUNTY OREGON

IN THE MATTER OF A COMPREHENSIVE)
PLAN MAP AND ZONING MAP AMENDMENT)
APPLICATION BY CAROL CROMWELL TO)
CHANGE THE COMPREHENSIVE PLAN MAP)
AND ZONING MAP DESIGNATIONS ON A)
15.25-ACRE PROPERTY)

RESOLUTION &
ORDER NO. 2012-181
Planning and Building Department
(Findings and Conclusions)
(BC12-0001)

WHEREAS, The Board of County Commissioners for Linn County (Board) conducted a duly advertised public hearing on June 27, 2012 for the purpose of considering the matter of a proposed *Comprehensive Plan* map amendment and zoning map amendment that would amend the *Comprehensive Plan* map designation and the zoning map designation on 15.25 acres identified as Tax Lot 903 on map T12S, R1W, Section 7;

WHEREAS, The proposed *Comprehensive Plan* map amendment and zoning map amendment had been previously considered by the Linn County Planning Commission at a duly advertised meeting on June 12, 2012 and who voted unanimously to recommend approval to the Board;

WHEREAS, The Board, after considering all testimony and evidence submitted, reached a consensus to recommend that a modification of the proposed *Comprehensive Plan* map amendment and zoning map amendment be adopted; and

WHEREAS, The findings in support of the proposed *Comprehensive Plan* map amendment and zoning map amendment are attached hereto as Exhibit 1 (BC12-0001 Decision Criteria, Findings and Conclusion); and now therefore, be it

RESOLVED, That the Board of County Commissioners for Linn County approve the Findings and Conclusions as set forth in Exhibit 1 (BC12-0001 Decision Criteria, Findings and Conclusions); and

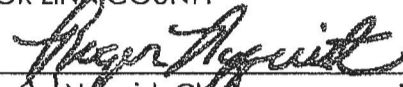
RESOLVED, That the Board of Commissioners for Linn County approve a *Comprehensive Plan* map amendment and a zoning map amendment on a 15.25-acre property (Tax Lot 903 on map T12S, R1W, Section 7); and

ORDERED, That the Linn County *Comprehensive Plan* map and the Linn County Zoning map be prepared by county staff for amendment to designate the 15.25 acres as

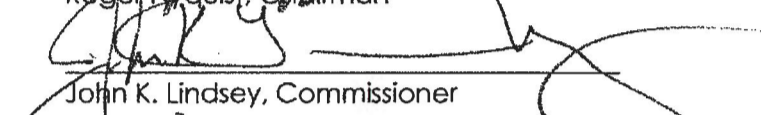
Non Resource on the *Comprehensive Plan* map and as Non-Resource-5 acre minimum (NR-5) on the zoning map.

Resolved this 11th day of July, 2012.

BOARD OF COUNTY COMMISSIONERS
FOR LINN COUNTY



Roger Nyquist, Chairman

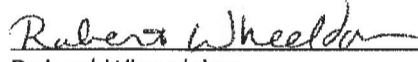


John K. Lindsey, Commissioner



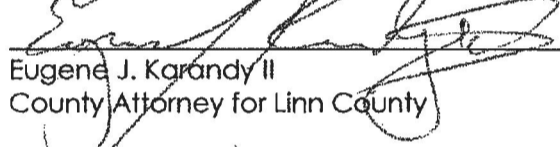
William C. Tucker, Commissioner

APPROVED AS TO CONTENT:



Robert Wheeldon
Director, Linn County Planning and Building

APPROVED AS TO FORM:



Eugene J. Karandy II
County Attorney for Linn County

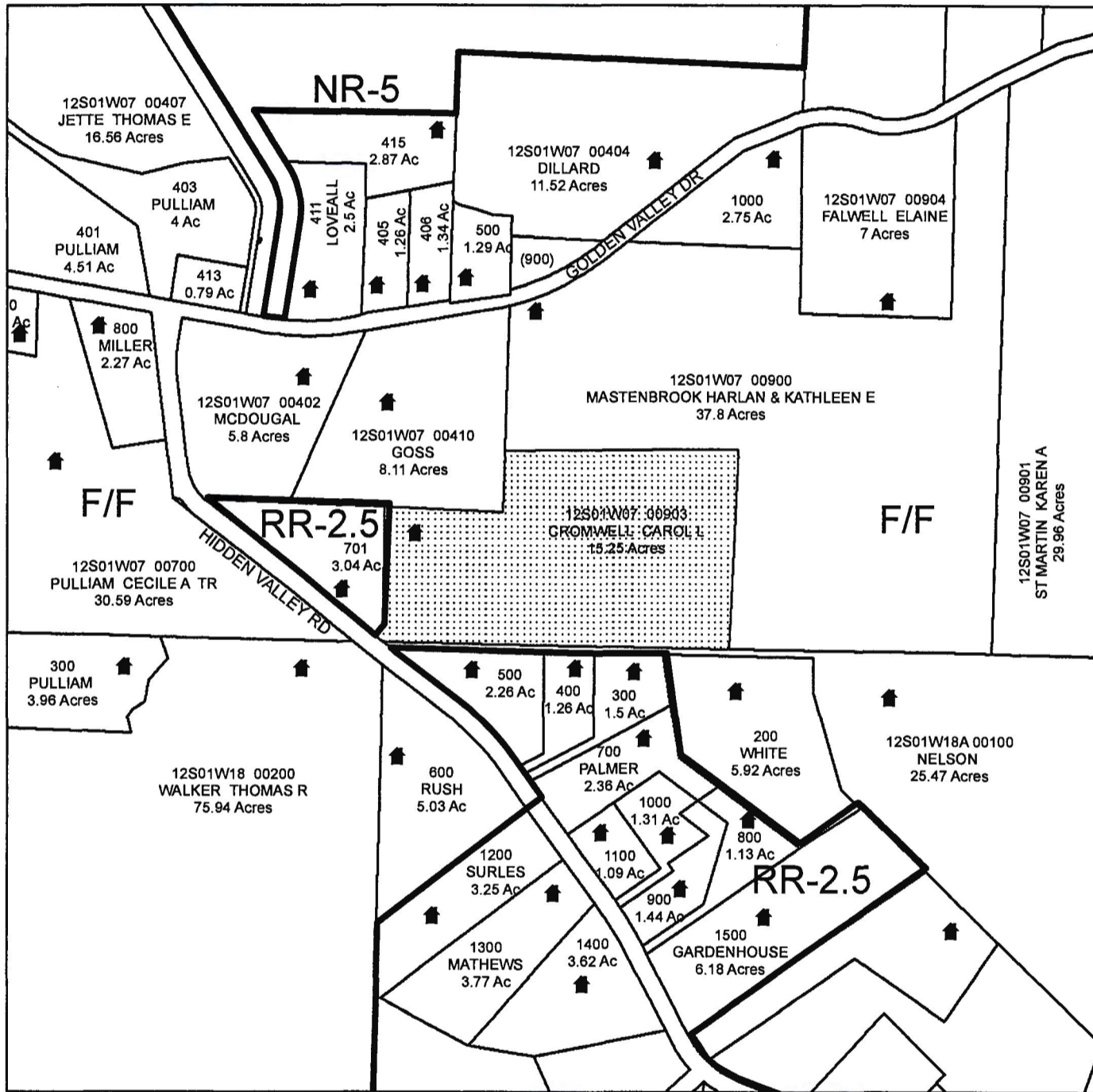
Exhibit 1

BC12-0001; Carol Cromwell

Decision Criteria, Findings and Conclusions

Linn County Planning & Building Department

Notice Map



Legend:

- Zoning
- PIN12S01W07 00903
- taxlots

Parcel Details:

BC12-0001
 12S01W07 00903
 CROMWELL CAROL L
 15.25 acres

North Arrow:

N
 W E
 S



01/04/2012

WRITTEN STATEMENT

REQUESTS:	1. Comprehensive Plan Map Amendment from Farm/Forest to Non-Resource. 2. Zoning Map Amendment from F/F to NR-5.
DECISION CRITERIA:	LCC 921.874; LCC 921.822(A)
APPLICANT / OWNER:	Carol Cromwell
PREPARED BY:	Rich Catlin, Reece & Associates Inc.
MAP / TAX LOT:	12-1W-07 / 903
AREA:	Approximately 15.25 Acres

This written statement is part of the applications for a Comprehensive Plan Map Amendment and Zoning Map Amendment from Farm/Forest (F/F) to Nonresource (NR-5). This written statement constitutes the applicant's burden of proof to explain how the applications satisfactorily meet the decision criteria set forth in Linn County Development Code Sections 921.874 and 921.822(A).

The Map Amendment applications are proposed for a unit of land identified as Tax Lot 903 on Linn County Assessors Map 12-1W-07 (Exhibit 1). This unit of land is referred to hereafter as the "subject property." It is held by Carol Cromwell who is the "applicant" for these Map Amendment applications. The subject property is zoned Farm/Forest (FF) (Exhibit 2).

The subject property is situated in the lower foothills of the Cascade Range about ¾ mile east of Lebanon. A residence dating to 1979 is located near the northwest corner of the subject property (Exhibit 3). Poor soils impair tree vegetative growth on the site as evidenced by a partially open canopy of oak and sparse ground cover (Exhibit 4). The general area is characterized by homesteads in a rural setting. Farm and forest uses are limited to isolated pockets of bottomland pasture and timber. Of 93 tax lots within one-half mile of the subject property, 81% have homes, and 91% of those homes are owner-occupied. The density is 35 homes per square mile. The median tax lot size is 3.62 acres. Land to the south and west of the subject property is zoned Rural Residential. To the north and east, it is F/F. About 700 feet north is another tax lot zoned NR owned by Allan Merrill.

Statewide Planning Goal 3 (Agricultural Lands) and Goal 4 (Forest Lands) broadly define agricultural and forest lands, and require that rural lands that fall within those definitions be planned and zoned to protect those lands for farm and forest use. The Farm/Forest designation applies both Goals 3 and 4 to the subject property. The F/F designation was applied in a broad brush fashion to this area without regard to local factors that impair actual farm and forest use of the land. This application makes the case that the subject property does not qualify as agricultural and forest land due to poor soils, parcelization, and development patterns in the area.

The decision criteria for a Comprehensive Plan Map Amendment and Zoning Map Amendment are set forth in the Linn County Development Code. Statewide planning goals and administrative rules are also applicable to this proposal. Applicable criteria are printed in **bold italics**. Relevant goal language, rules, statutes, policies, and code language are printed in *italics*. Abbreviations used: OAR = Oregon Administrative Rules, LCC = Linn County Code.

COMPREHENSIVE PLAN MAP AMENDMENT

The decision criteria for a Comprehensive Plan map amendment are set forth in LCC 921.874. These criteria are addressed in the following sections.

Criterion 1. The amendment is consistent with and does not alter the intent of applicable section(s) of the Comprehensive Plan;

The following Comprehensive Plan policies for the Non-Resource designation set for in LCC 905.960 are applicable to the proposed Comprehensive Plan Map Amendment:

A. Linn County shall provide for the appropriate and orderly development of Non-Resource lands while minimizing potential conflicts with other land uses.

In this policy, Linn County is charged with adopting land use regulations that "provide for the appropriate and orderly development of Non-Resource lands". Those regulations are embodied in the Linn County Land Development Code both as specific provisions for the NR zoning district (LCC 929.910-930) and as general provisions that regulate development of land such as those set forth in LCC Chapters 934 and 935.

When considering the use and development standards in LCC Chapters 929, 934, and 935, the question is whether those standards can be applied in an appropriate and orderly manner while minimizing potential conflicts with other land uses. Considerable attention is given later in this narrative to addressing the issue of compatibility. To the extent that the subject property could be used and developed under the standards in LCC 929, 934, and 935 while imposing minimal conflicts with other land uses, this criterion is met. Without repeating that narrative here, the reader is directed to the discussion of compatibility later in this narrative. Findings and conclusions regarding compatibility, adverse impacts, and potential conflicts in response to Criterion 2 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

B. Land designated Non-Resource should have conditions that permit development with a limited exposure to geological hazards or a 100-year flood.

Findings and conclusions regarding exposure to geologic hazards and the 100-year flood in response to Goal 7 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

C. Land designated Non-Resource should be located or have the capability to be included in a rural fire protection district.

This criterion is met because the subject property is located in the Lebanon Rural Fire District.

D. Land designated Non-Resource should have favorable conditions for location of subsurface waste disposal systems and for supplying adequate amounts of potable water.

Findings and conclusions regarding subsurface waste disposal systems and groundwater availability in response to Goal 6 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

E. Land designated Non-Resource should have access to a county road with sufficient capacity to accommodate additional development.

The subject property has 30 feet of frontage on and physical access to Hidden Valley Road, a paved two lane County road in good repair connecting Golden Valley Drive and Berlin Road. Approximately 90 homes on Hidden Valley Road and four cross roads generate approximately 90 PM peak hour trips. A road constructed to this standard generally has a capacity of 200 to 300 PM peak hour trips. The proposed zoning map amendment to NR-5 would provide the opportunity to divide the subject property into three parcels and create two additional residences which would generate two PM peak hour trips per day, according to Trip Generation (ITE, 7th Edition). No road capacity or accident issues were identified in this vicinity. Therefore Hidden Valley Road has sufficient capacity to accommodate the additional development that would result from the proposed map amendment. The existing driveway has adequate sight distance for vehicles entering and exiting the property. The specific method of extending access beyond the County road to future home sites would be reviewed by Linn County as part of the land division process.

F. The Non-Resource Plan designation is implemented with two Non-Resource zoning districts that are distinguished only by minimum property size standards. The NR-5 zone has a 5-acre minimum property size for new units of land and the NR-10 zone has a 10-acre minimum property size for new units of land.

G. The NR-5 (5-acre minimum for new units of land) district is applied to suitable areas in order to maintain a rural development pattern reasonably compatible with nearby resource and non-resource lands. When applied near agricultural and forest resource areas, the 5-acre size standard will maintain an adequate buffer to minimize potential conflicts.

H. The NR-10 (10-acre minimum for new units of land) district is applied to suitable areas where larger property sizes are necessary to maintain a rural development pattern reasonably compatible with nearby resource and non-resource lands, or where larger property sizes are necessary to meet residential suitability characteristics such as groundwater availability, septic suitability, or access standards. When applied near agricultural and forest resource areas, the 10-acre size standard will maintain an adequate buffer to minimize potential conflicts.

This response addresses Policies F, G and H because the same evidence is presented in support of the NR-5 designation.

Within one-half mile of the subject property, there are 93 tax lots containing 75 homes (Exhibit 5). The median size is 3.62 acres. In the F/F zone the median size is 7.43 acres. In the RR zone it is 1.48 acres. Table 1 summarizes these data.

Cromwell Map Amendments

Table 1, Tax Lot Data Within One-Half Mile of the Subject Property

Zone	Number of Tax Lots	Total Area (Acres)	Median Area (Acres)	Number of Homes (Percent of parcels)	Number of Ownerships
All Zones	93	1,358.20	3.62	76 (82%)	82
F/F Only	55	1200.93	7.00	40 (73%)	47
RR Only	37	89.25	1.48	36 (97%)	34
NR Only	1	68.02	n/a	0	1

Source: Linn County Assessor

This pattern is more magnified for the tax lots adjacent to the subject property. There are seven tax lots around the periphery of the subject property. Four are zoned RR-2.5. All seven have houses. The median size is 3.04 acres. Table 2 summarizes these data.

Table 2, Data for Tax Lots Adjacent to the Subject Property

Map Tax Lot	Acres	Zoning	Site Address	Home?
12S01W07 00410	8.11	F/F	38626 Golden Valley Dr	Yes
12S01W07 00701	3.04	RR-2.5	32525 Hidden Valley Rd	Yes
12S01W07 00900	37.80	F/F	38682 Golden Valley Dr	Yes
12S01W18A 00200	5.92	F/F	38746 Nelson Ln	Yes
12S01W18A 00300	1.50	RR-2.5	38711 Nelson Ln	Yes
12S01W18A 00400	1.26	RR-2.5	38695 Nelson Ln	Yes
12S01W18A 00500	2.26	RR-2.5	32479 Hidden Valley Rd	Yes

Source: Linn County Assessor

The pattern that emerges from the maps and from these data is one of small lot residential use non-resource use in a rural atmosphere mixed with a few modest sized non-resource parcels. The overwhelming majority (93%) of homes within one-half mile of the subject property appear to be owner-occupied. Only 12% of landowners own more than one parcel in the study area. The only adjacent tax lot of any size, Tax Lot 900, 37.80 acres, is owner-occupied and supports a mixed stand of hardwoods and softwoods that does not present evidence that it is commercially-managed forest land, such as removal of non-merchantable trees, planting of merchantable seedlings, or selective removal of merchantable trees. The proposed NR-5 designation would result in three 5-acre parcels for residential use, a land use pattern which is consistent with the existing land use pattern. Therefore the proposed NR-5 designation is compatible with the existing parcelization and non-resource land use pattern. In the absence of nearby farm and forest use, a buffer is not warranted. Findings and conclusions regarding access and road capacity as they address LCC 905.960(E) earlier in this narrative are incorporated by reference to demonstrate compliance with this policy. Findings and conclusions regarding subsurface waste disposal systems and groundwater availability as they address Goal 6 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

I. New public sewer and water systems may not be established within the NR zone unless the County determines that a health hazard exists pursuant to DEQ or Oregon Health Division procedures and criteria. A new or extended public water or sewer system is appropriate in the rural areas only when needed to protect the public's health and safety.

No public sewer or water systems are proposed or are necessary for the property. The summary of well logs in the vicinity and septic approvals on the subject property demonstrate the capacity to support two additional residences on the subject property. New wells and septic systems would be installed in accordance with regulations intended to safeguard the health and safety of all residents in the area. Findings and conclusions regarding agricultural suitability in response to Statewide Planning Goal 6 (Air, Water and Land Resources Quality) later in this narrative are incorporated by reference to demonstrate compliance with this policy.

J. A comprehensive plan and zoning map amendment must be approved before property designated Agricultural Resource or Farm/Forest can be amended to a Non-Resource Plan map designation. In addition to the LCC plan amendment criteria, the following criteria (Statewide Planning Goal and Administrative Rule resource land definition) must be met:

- (1) The land is not predominantly SCS Class I, II, III and IV soils.***
- (2) The land is not intermingled with or adjacent to SCS Class I-IV land within the same farm unit.***
- (3) The land is not suitable for farm use taking into consideration;***
 - (a) Soil fertility;***
 - (b) Suitability for grazing;***
 - (c) Climatic conditions;***
 - (d) Existing and future availability of water for farm irrigation purposes;***
 - (e) Existing land use patterns;***
 - (f) Technological and energy inputs required; or***
 - (g) Accepted farming practices.***
- (4) The land is not necessary to permit farm practices to be undertaken on adjacent or nearby agricultural lands.***
- (5) The land is not suitable for commercial forest uses including adjacent or nearby lands which are necessary to permit forest operations or practices on commercial forest lands or other forested lands that maintain soil, air, water and fish and wildlife resources.***

Subsections (1)-(4) mimic the language of Statewide Planning Goal 3 (Agricultural Land). Findings and conclusions regarding agricultural suitability in response to Goal 3 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

Subsection (5) mimics the language of Statewide Planning Goal 4 (Forest Lands). Findings and conclusions regarding forest capability in response to Goal 4 later in this narrative are incorporated by reference to demonstrate compliance with this policy.

K. An exception to Statewide Planning Goals 3 and 4 is not required to support a plan map amendment to a Non-Resource Plan designation when detailed and

factual evidence shows that the lands are not farm or forest lands as defined in the Goals.

No exception is required because overwhelming, detailed, and factual evidence is presented in this application in support of a plan map amendment to a Non-Resource Plan designation. The evidence and accompanying findings addressing Statewide Planning Goals 3 and 4 later in this narrative are incorporated herein by reference in response to this policy.

L. Notwithstanding the provisions of LCC 905.120(G) and LCC 905.330(G), conversion of lands designated as Agricultural Resource or Farm/Forest in the Comprehensive Plan to a Non-Resource Plan designation does not require an exception to Statewide Planning Goal 3 or Goal 4.

No exception is required here because it is demonstrated that Statewide Planning Goals 3 and 4 do not apply to the subject property

M. Applying the Non-Resource designation on isolated tracts surrounded by farm or forest lands shall be discouraged if it is shown that a non-resource designation would adversely affect existing farm or forest uses.

A description of adjacent uses was presented earlier in this narrative in response to LCC 905.960(F-H). Those findings show that adjacent properties do not meet the definition of farm or forest lands. In fact, the subject property is surrounded by non-resource uses. Those findings and conclusions are incorporated herein by reference in response to this policy. This criterion does not apply because the condition of the criterion "...surrounded by farm or forest lands..." is not supported in the evidence or findings.

N. Only land designated Agricultural Resource, Farm/Forest, Agricultural Resource- Rural Residential Reserve or Farm/Forest-Rural Residential Reserve are eligible for a map amendment to Non-Resource.

The subject property is designated Farm/Forest making it eligible for a map amendment to Non-Resource as required by this policy.

Criterion 2. The amendment will be compatible with adjacent uses and will not adversely impact the overall land use pattern in the area;

This criterion is presented in two parts. In the first part, the target area is "adjacent uses" and the question is compatibility. In the second part, the potential of the proposed map amendment to impact the overall land use pattern of an undefined area is assessed to determine whether it would be an adverse impact. Both parts begin with an examination of existing uses (What are the adjacent uses? What is the overall land use pattern?), followed by a description of the proposed use, comparison of uses, and a summary conclusion of compatibility and adverse impact.

Part 1: "***The amendment will be compatible with adjacent uses...***"

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A description of adjacent uses was presented earlier in this narrative in response to LCC 905.960(F-H). Findings and conclusions regarding capability with adjacent uses are incorporated by reference to demonstrate compliance with this policy.

Part 2: *"The amendment ... will not adversely impact the overall land use pattern in the area."*

The size or extent of the "area" to be examined is not specified in this criterion or in other applicable criteria. In fact, "area" is defined in LCC 920.100 as "an unspecified quantity of land." In the absence of a fixed value, for purposes of this application, the area was first defined qualitatively to see if a size or extent emerged.

The subject property is located in the lower foothills of the Cascade Range about ¾ mile east of Lebanon. Elevations range from 600 to 725 feet (Exhibit 6). The rolling topography and shortness of the growing season is prohibitive to most farm use although some fenced pasture can be found on the bottomland of the narrow valleys. Likewise the settlement and parcelization pattern is not conducive to commercial forest production although individual landowners may manage their land as small woodlots. Homes are found throughout this area due to the short drive to Lebanon. A single land use does not define the general land use pattern of the area. Rather it is a conglomerate composed of small-scale resource and non-resource uses although the concentration or degree of aggregation of uses varies by location. This was confirmed by a windshield survey along Hidden Valley Road and Golden Valley Road.

This characterization is also supported by the Farm/Forest designation applied to this area. According to the Linn Comprehensive Plan, F/F is primarily a resource zone, subject to both Goals 3 and 4, but with full recognition of smaller parcel sizes and extensive residential development. Resource uses are limited to livestock grazing and small-scale timber operations. See LCC 905.300.

In contrast are the Exclusive Farm Use and Forest Conservation and Management zones. These zones also implement Goals 3 and 4, respectively. These resource zones are applied to areas where significant amounts of acreage are dedicated to commercial farm and forest operations. These highly productive lands are generally held in large ownerships that significantly contribute to the resource-based economy. This is not the land use pattern in the vicinity of the subject property. In fact, the nearest EFU-zoned property is located one mile northwest, and the nearest FCM-zoned property is 1.6 miles east.

Within this context, what evidence is there on the ground to characterize the land use pattern in the area? The subject property is situated near the top of a ridge that runs northeast to southwest (Exhibit 6). It has already been established that the land uses adjacent to the subject property are limited to non-resource uses. Table 2 indicates that the seven adjacent tax lots are held in seven different ownerships. Each contains a home that is owner-occupied. The median size is 3.04 acres. No farm use or forest use as defined by Goals 3 and 4 is evident on these tax lots. This single land use pattern is not indicative of the area described above.

Extending the examination outward from the adjacent properties, this pattern of small lot residential use continues almost 4,000 feet to the south and southeast through a Rural Residential zoned area. To the northeast and southwest along the ridge, land is more distant

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from county roads, reducing the desirability of residential development. Parcels are larger and homes are fewer. Small woodlots are the predominant land use.

Land in farm use is found to the north and northwest along Golden Valley Road. The road follows the southern edge of a rapidly narrowing west-facing valley. Fenced pasture for cattle was observed to the north and northwest, a distance of more than 1,100 feet and extending northwesterly for more than a mile. Large tract forest lands are prevalent further north and to the northeast.

Given distances to various land uses in the vicinity of the subject property, a radius of one-half mile was selected to define the "area" because it encompasses a sample of all the land uses generally encountered in the lower Cascade foothills near an incorporated city.

A radius of one-half mile from the subject property captures 93 tax lots in whole or in part. Characteristics of the land uses within the area are listed in Exhibit 5. Within this area, there are 76 homes on 82 ownerships. Only two tax lots are larger than the 80-acre minimum lot size for F/F. 58% of tax lots are smaller than five acres. 50% of the area is concentrated in 6% of the tax lots. Much of the land in the area is wooded with mixed hard wood and soft wood stands. None of the tax lots is owned by a commercial wood products company. There is fenced pasture for cattle on four tax lots to the north along Golden Valley Road.

The overall land use pattern that emerges is not simple or uniform. Rather it is diverse in nature and differentiated in character. The common thread is residential use in a rural setting, occasionally associated with small scale farm and forest activities. The density of residential use fluctuates through the area. If approved, the proposed map amendments will result in the potential for five-acre parcels for residential use in a rural setting. This compares to a median tax lot size of 3.62 acres with a home. It is expected that the potential uses will not impact the overall land use pattern of the area. In fact it will be quite consistent with the overall pattern.

Criterion 3. The amendment, if within an adopted urban growth boundary, is in substantial conformity with the Comprehensive Plan and implementing ordinances of an affected city;

This criterion does not apply because the subject property is not located within an urban growth boundary.

Criterion 4. The amendment will not have a significant adverse impact on a sensitive fish or wildlife habitat;

This criterion does not apply because no sensitive fish or wildlife habitat has been identified within the vicinity of the subject property.

Criterion 5. The amendment will not have a significant adverse impact upon the provision of public facilities including police and fire protection, sanitary facilities and storm drainage facilities;

The subject property is served by privately operated water, sewage disposal, and storm drainage facilities. The Linn County Sheriff's Department provides Law enforcement services.

The Lebanon Rural Fire District provides fire suppression services for structural fires. No adverse impact to these facilities is anticipated with the proposed amendment.

Criterion 6. The amendment will not have a significant adverse impact upon the transportation facilities;

This criterion mimics the language of the Transportation Planning Rule (TPR) which is applicable to this comprehensive plan amendment. [OAR 660-012-0060(1)] The TPR states:

If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

- (a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);***
- (b) Change standards implementing a functional classification system; or***
- (c) Result is any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.***
 - (A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;***
 - (B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or***
 - (C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.***

A description of the traffic generation and roadway capacity is presented under LCC 905.960(E) earlier in this narrative. Those findings speak directly to this criterion and are incorporated herein by reference in support of the conclusion that this criterion does not apply because the proposed map amendment will not have a significant adverse effect on transportation facilities.

Criterion 7. The presence of any development limitations including geologic hazards, flood hazards or water quality or quantity will not have a significant adverse affect on land uses permitted through the amendment;

There are no geologic hazards identified in the vicinity of the property according to "Geologic Hazards of Linn County, Oregon" published by the Oregon Department of Geology and Mineral Industries.

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There is no jurisdictional floodplain in the vicinity of the subject property according to FIRM 41043C0590G, effective September 29, 2010, published by the National Flood Insurance Program of the Federal Emergency Management Agency.

The Oregon Water Resources Department regulates appropriation of water. The Water Resources Commission has established 12 ground water limited areas in the Willamette Basin, the nearest being in the South Salem Hills approximately 20 miles north of the subject property. WRD has not identified a shortage of groundwater in the vicinity of the subject property. Therefore no limitations on development due to water quantity have been identified.

No other development limitations would affect the ability to use the subject property as intended through the amendment.

Criterion 8. An exception to the statewide planning goals is not required. If required, then findings have been prepared to meet the exception criteria; and

An exception to Goals 3 and 4 is not required for a Comprehensive Plan map amendment to NR pursuant to Non-Resource Lands Policy (K) which states:

An exception to Statewide Planning Goals 3 and 4 is not required to support a plan map amendment to a Non-Resource Plan designation when detailed and factual evidence shows that the lands are not farm or forest lands as defined in the Goals.

Therefore this criterion is met.

Criterion 9. The amendment is consistent with the statewide planning goals.

On June 20, 1985, the Land Conservation and Development Commission acknowledged the Linn County Comprehensive Plan and implementing ordinances as being in compliance with the Statewide Planning Goals. Subsequent post-acknowledgement plan amendments must also comply with the goals.

Goal 1, Citizen Involvement: *To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.*

Opportunities for citizen involvement occurred during the formulation and adoption of the Linn County Comprehensive Plan and Land Development Code. The Oregon Land Conservation and Development Commission acknowledged the Comprehensive Plan and Land Development Code as being in compliance with Goal 1.

In quasi-judicial proceedings conducted for map amendments as proposed by the applicant, the Land Development Code sets forth the acknowledged provisions for citizen involvement at public hearings before the Planning Commission and Board of Commissioners. Based on these provisions, citizens will have ample opportunity to review and comment on the proposed map amendments.

For these reasons, the proposed map amendments comply with Goal 1.

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Goal 2, Land Use Planning: *To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.*

The Land Development Code sets forth the planning process for reviewing quasi-judicial proceedings conducted for map amendments as proposed by the applicant. The Linn County Comprehensive Plan provides the policy framework for making such decisions. The Oregon Land Conservation and Development Commission acknowledged the Comprehensive Plan and Land Development Code as being in compliance with Goal 2. The applicant has submitted adequate factual information in support of the proposed map amendments.

For these reasons, the proposed map amendments comply with Goal 2.

Goal 3, Agricultural Lands: *To preserve and maintain agricultural lands.*

Goal 3 states in part:

Agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest and open space and with the state's agricultural land use policy expressed in ORS 215.243 and 215.700.

Goal 3 defines Agricultural Land as follows:

In western Oregon is land of predominantly Class I, II, III and IV soils and in eastern Oregon is land of predominantly Class I, II, III, IV, V and VI soils as identified in the Soil Capability Classification System of the United States Soil Conservation Service, and other lands which are suitable for farm use taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land-use patterns, technological and energy inputs required, or accepted farming practices. Lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands, shall be included as agricultural land in any event.

To qualify as Non-Resource land in Linn County, LCC 905.920(A)(5) states that land is not suitable for agricultural use based upon the following criteria which are summarized from the goals and administrative rules:

- (1) *The land is not predominantly SCS Class I, II, III and IV soils.*
- (2) *The land is not intermingled with or adjacent to SCS Class I-IV land within the same farm unit.*
- (3) *The land is not suitable for farm use taking into consideration:*
 - (a) *Soil fertility;*
 - (b) *Suitability for grazing;*
 - (c) *Climatic conditions;*
 - (d) *Existing and future availability of water for farm irrigation purposes;*
 - (e) *Existing land use patterns;*
 - (f) *Technological and energy inputs required; or*
 - (g) *Accepted farming practices.*
- (4) *The land is not necessary to permit farm practices to be undertaken on adjacent or nearby agricultural lands.*

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The USDA Natural Resources Conservation Service soils map shows that the subject property consists of a complex mixture of three soils: moderately deep, well drained Dixonville soils; shallow, well drained clayey Philomath soils; and moderately deep, clayey, somewhat poorly drained Hazelair soils. [Exhibit 7] The three soils are described as being present in approximately equal proportions. Approximately 49 percent (map unit 35C) of the property has slopes ranging from 3-12 percent, and 51 percent (map unit 35E) has slopes between 12 and 30 percent. Both map units are rated as Class VI soils. The subject property is western Oregon land that is not predominantly Class I, II, III and IV soils. Therefore soils do not qualify the subject property as Agricultural Land under Goal 3.

Considering soil fertility as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"The soils are low in fertility as evidenced by low productivity of grasses in the grasslands and slow growth of trees on the forested areas."

Considering suitability for grazing as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"The area is capable of supporting cattle or sheep grazing at an extremely low stocking rate. It has been grazed lightly in the past and is fenced. The current fences are in poor repair and are supplemented by an electric fence. Livestock water must come from the domestic well at the house. The property had not been grazed this year. The overstory of the oak provides sufficient shade so that productivity of forage in the understory is nil. The 14 acres of forested land should provide sufficient forage for about one mature cow for one month. The acre and a quarter of grassland should provide sufficient forage for about three cows for one month. The total capacity to sustain livestock grazing is about 4 cow months per year. Grazing at stocking levels higher would put excessive pressure on the perennial grasses and the productivity would deteriorate. Developing the property for grazing would require removal of forest overstory, seeding with improved forage species, fertilization and developing a reliable source of livestock water. The cost would far exceed the potential income from conversion to pasture.

The property is not capable of providing profitable livestock grazing due to its limited productivity and small area. It does not have potential to be developed profitably for livestock grazing."

Considering climatic conditions as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"The soils have slow permeability because of their physical structure. The Hazelair soil is poorly drained and holds water near the surface during the rainy months. When the growing season begins the Philomath and Dixonville soils dry rapidly and consequently have a very short growing season. The Hazelair soil dries more slowly and has a slightly longer growing season so the forage matures later. The consequence of this is that forages will be deficient in required nutrients for livestock by early summer (about mid-July) and livestock would need nutritional supplements to maintain productivity."

Considering existing and future availability of water for farm irrigation purposes as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

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"There is no existing water available for irrigation purposes. The well log for the current domestic well indicates the static water level in March was at 33 ft and it pumped 20 gpm for 1 hour exhausting the water supply to the bottom of the well at 85 ft. The recharge potential is not known nor is the availability of water in the summer months. Nevertheless, irrigated pasture under traditional irrigation would require a supply of about 70 gpm for pasture and more for crops so significantly more water would need to be developed for irrigated farming. The limited potential to produce forage and crops precludes economical development of irrigation, even if it is possible to drill a well with sufficient yield to irrigate the property."

Considering existing land-use patterns as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"The property has not been used for livestock grazing as a farm business. The limited past grazing has been for personal desires of the landowner. The land shows no evidence of being farmed or of timber production."

Considering technological and energy inputs required as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"Management for existing land uses does not require technological inputs except for access for fire prevention and management in the event of a fire. The limited grazing uses a single wire electric fence in some areas of the property."

Considering accepted farming practices as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"Foothills in the Willamette Valley are primarily used for pasture, woodlots or Christmas tree production. Grapes, berries and tree fruits are grown on some soils but require substantial inputs in irrigation and fertilization. The slopes and poor agricultural soils on most of the property limit any row crop uses. In order to convert the property to Christmas tree or any crop the overstory of white oak and the stumps would need to be removed. This would be very expensive and open some slopes to hazards from erosion.

Because of its small size, lack of irrigation water and poor soils the area is not capable of supporting any economical farming enterprise."

Considering lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands as a suitability factor for farm use, the expert testimony of Dr. William C. Krueger in Exhibit 8 is that:

"No surrounding land is farmed."

After considering these suitability factors for farm use, Dr. William C. Krueger concludes in Exhibit 8 that:

"Commercial uses of the property for agricultural purposes would not be economical or practical due to inherent limitations of the property."

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Based on the soils mapped on the property by NRCS and the expert testimony of Dr. William C. Krueger, the subject property does not meet the definition of Agricultural Land as set forth in Goal 3. Therefore, Goal 3 does not apply to the subject property.

Goal 4, Forest Lands: To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

Goal 4 states in part:

Forest lands are those lands acknowledged as forest lands as of the date of adoption of this goal amendment. Where a plan is not acknowledged or a plan amendment involving forest lands is proposed, forest land shall include lands which are suitable for commercial forest uses including adjacent or nearby lands which are necessary to permit forest operations or practices and other forested lands that maintain soil, air, water and fish and wildlife resources.

The method for identifying forest lands is prescribed in the Goal 4 rules [OAR 660-006-0010, Exhibit 9]:

- (1) Governing bodies shall identify "forest lands" as defined by Goal 4 in the comprehensive plan. Lands inventoried as Goal 3 agricultural lands, lands for which an exception to Goal 4 is justified pursuant to ORS 197.732 and taken, and lands inside urban growth boundaries are not required to be planned and zoned as forest lands. Lands suitable for commercial forest uses shall be identified using a mapping of average annual wood production capability by cubic foot per acre (cf/ac) as reported by the USDA Natural Resources Conservation Service.*
- (2) Where NRCS data are not available or are shown to be inaccurate, other site productivity data may be used to identify forest land, in the following order of priority:
 - (a) Oregon Department of Revenue western Oregon site class maps;*
 - (b) USDA Forest Service plant association guides; or*
 - (c) Other information determined by the State Forester to be of comparable quality.**
- (3) Where data of comparable quality under subsections (2)(a)-(c) are not available or are shown to be inaccurate, an alternative method for determining productivity may be used as described in the Oregon Department of Forestry's Technical Bulletin entitled "Land Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010."*

The Linn County inventory of forest lands is based on the USDA Natural Resources Conservation Service soils map that shows the Dixonville-Philomath-Hazelair complex mapped on the subject property (Exhibit 7). This complex mixture of three soils contains: moderately deep, well drained Dixonville soils; shallow, well drained clayey Philomath soils; and moderately deep, clayey, somewhat poorly drained Hazelair soils. According to USDA NRCS, this soil complex is composed of the three soils in approximately equal proportions. Approximately 49 percent (Unit 35C) of the property has slopes ranging from 3-12 percent, and 51 percent (Unit 35E) has slopes between 12 and 30 percent.

The USDA NRCS reports the following regarding the suitability of Units 35C and 35E for commercial forest uses (Exhibit 10):

"This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, the potential production per acre is 6,900 cubic feet from an even-aged, fully stocked stand of trees 60 years old or 63,900 board feet (International rule, one-eighth-inch kerf) from an even-aged, fully, stocked stand of trees 90 years old. On the basis of a 50-year site curve, the mean site index is 100. Douglas-fir, grand fir, and Oregon white oak commonly grow on this unit. The main concerns in producing and harvesting timber are equipment limitations, seedling mortality, and plant competition."

As noted earlier, Dixonville is but one component of the Dixonville-Philomath-Hazelair complex and yet there is no mention in the preceding text of the productivity of the Philomath or Hazelair components in the complex or the overall productivity of the soil complex. To correct this apparent oversight, the State Forester in cooperation with the Oregon Department of Land Conservation and Development provided a Technical Bulletin entitled "Land Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010" (Exhibit 11) to explain alternative procedures. This Bulletin is embodied in the procedures for identifying forest lands set forth in OAR 660-006-0010. In that Bulletin, the State Forester determined the following forest soils information to be of comparative quality for use in identifying forest land:

February 8, 1990, Forest Lands Soils Ratings – Revisions produced by the Oregon Department of Forestry for the Oregon Department of Land Conservation and Development (applicable to Benton, Lane, Linn, Marion, Polk, and Yamhill Counties except in Lane County where superseded by the August 1997 Lane County Soils Ratings for Forestry and Agriculture).

In *Forest Lands Soils Ratings*, the State Forester issued revised forest lands soils ratings for several counties including Linn County. According to the section for Linn County Forest Soil Ratings, Units 35C and 35E have a Site Index Rating of "Low" and an estimated productivity of 45 cubic feet per acre per year (Exhibit 10), much lower than the site index of 120 by USDA NRCS.

Land Use Planning Notes Number 3 does not rely exclusively on soil productivity ratings published by the USDA NRCS or other sources in determining whether land is "forest land" under the Goal 4 definition. *Land Use Planning Notes Number 3* allows an applicant to contradict published data with empirical studies of the actual productivity of the soils on the subject property. This approach was upheld in *Hecker v. Lane County*, 52 Or LUBA 91 (2006).

Marc A Setchko is a consulting forester who reviewed existing published information regarding productivity of the soils mapped by the USDA NRCS. He then conducted a timber cruise of the subject property to determine the actual productivity of the land. In his report entitled "Forest Productivity Analysis for Carol Cromwell", Mr. Setchko concluded the following (Exhibit 12):

"For Dixonville-Philomath-Hazelair complex (35C and 35E) mapped on this site, the NRCS listed site index of 120 cf/ac/yr reflects the potential production of the Dixonville component which accounts for only 30 percent of the complex. Referring instead to "Forest Lands Soils Ratings", ODOF estimates a productivity rating of 45 cf/ac/yr for Dixonville-Philomath-Hazelair complex in Linn County. Direct tree measurements determined the actual productivity of the site to be in the range of 29.75 cuft/ac/yr to 32.72 cuft/ac/yr." [Emphasis original]

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As noted in OAR 660-006-0010(1), "Lands suitable for commercial forest uses shall be identified using a mapping of average annual wood production capability by cubic foot per acre." At first glance, this language could lead one to believe that if you know the number in cubic feet per acre per year, you will be able to know if it qualifies as forest land. That is not the case. There is no quantitative threshold in state law for identifying forest lands. This point has been argued and upheld by the Oregon Court of Appeals in *Potts v. Clackamas County*, 42 Or LUBA 1, 5, aff'd 183 Or App 145, 52 P3d 449 (2002):

"Neither Goal 4 nor the administrative rules implementing Goal 4 set forth a precise methodology for determining whether land is suitable for commercial forestry."

While not actually establishing a threshold number, LUBA addressed forest productivity ratings in *Just v. Linn County* (LUBA No. 2009-068, November 9, 2009):

"Our cases suggest that land with a productivity of less than 20 cf/ac/yr may be unsuitable for commercial forest use unless there are factors that compensate for the land's relatively low productivity. But land in a middle range from a low of approximately 40 cf/ac/yr to a high of approximately 80 cf/ac/yr is unlikely to be unsuitable for commercial forest use unless there are additional factors that render those moderately productive soils unsuitable for commercial forest use. Rural land with a wood fiber productivity of over 80 cf/ac/yr is almost certainly suitable for commercial forest use, even if there are limiting factors.

Although those statutes are not written in terms of suitability for commercial forest use, there are at least some indication that the legislature may view the productivity level that is indicative of land that is suitable for commercial forest use to be approximately 20 cf/ac/yr in Eastern Oregon and approximately 50 cf/ac/yr in Western Oregon.

It may be that the cf/ac/yr productivity for a parcel using the data required by OAR 660-006-0010 and 660-006-0005(2) could be so high that the parcel is suitable for commercial forest use as a matter of law or that it could be so low that the parcel is unsuitable for commercial forest use as a matter of law."

While decision-makers may prefer to rely on a numeric threshold, in fact the language of the rule has both a qualitative component ("lands suitable for commercial forest uses") and a quantitative component ("average annual wood production capability by cubic foot per acre"). This dual definition is borne out by LCC 905.930(C):

It is not expected that many parcels will meet the criteria to be designated non-resource. Ideally, objective criteria would identify the location of non-resource land. Unfortunately, the identification of non-resource land is based largely on subjective criteria. This means the identification of non-resource lands can only be achieved on a case-by-case basis. Geographic information systems (GIS) mapping can identify parcels that do not have productive farm or forest soils. However, the definition of farm and forestland (previously cited) requires more analysis than just soil types. Soils maps can be an initial screening tool used to identify potential non-resource lands, but further study considering all of the resource land definition factors is required as part of an application to change a plan designation.

If soil productivity is a screening tool, it is instructive to understand the significance of a particular site productivity value. On this point, the report by Marc Setchko provides the context (Exhibit 12):

"As a professional forester for 35 years I prefer to manage properties with a productivity of 120 cf/ac/yr or above. This is the lowest productivity level of Site Class III ground. Site Class IV has a productivity of 85-119 cf/ac/yr; this is very tough ground to manage on a commercial level. Site Class V has a productivity level of 50-85 CF/ac/yr. this site class has an extremely slow growth rate and is not viable from a commercial standpoint, i.e., if considered from a cost-benefit viewpoint. This is the lowest Douglas-fir site class in western Oregon.

The key issue here is not whether or not trees will grow, but if the growth rates support commercial forest use. The characteristics of timberland, in terms of productive capacity, vary tremendously between different regions in Oregon. A preponderance of evidence points to 70 cu ft/ac as the accurate cut off for forestland designation in the Willamette Valley area.

The above cubic foot productivity numbers fit Lane County's parameters for productivity, with less than 85 cf/ac/yr of growth being considered "marginal" land and less than 50 cf/ac/yr of growth being considered "nonresource" land. While these numbers have not been adopted by Linn County, they are very realistic from a commercial forestry standpoint in Western Oregon.

To put these growth rates in perspective: the top Douglas-fir sites produce 260 cf/ac/yr of new growth. From this perspective it can be seen that less than 50 cf/ac/yr is extremely poor production from a growth standpoint. From a cost-benefit standpoint it cannot be considered commercially viable. From a forester's viewpoint, it is hard to consider a timber stand "commercial forest land" if it does not provide a monetary return to the owner."

After reviewing published values for soil productivity of Dixonville-Hazelair-Philomath complex, and after conducting an on-site assessment of tree growth, in the context of the range of growing conditions found in Western Oregon, particularly in the Willamette Valley area, the expert testimony of Marc Setchko in Exhibit 12 concludes that:

Any attempts to produce commercial stands on the] property would be futile.
[Emphasis original]

In conclusion, the cf/ac/yr productivity of 29.75 cuft/ac/yr to 32.72 cuft/ac/yr is "...so low that the subject property is unsuitable for commercial forest use as a matter of law", to quote *Just v. Linn County* (LUBA No. 2009-068, November 9, 2009) cited earlier.

Before turning to the "subjective criteria" for identifying forest lands alluded to in LCC 905.930(C), it is important to note the role of the State Forester in the land use process.

OAR 660-006-0010 does not require explicit approval by the State Forester of alternative methods used for determining productivity under subsection (3) as long as the alternative method is described in the Oregon Department of Forestry's Technical Bulletin entitled "*Land*

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Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010". The State Forester produced this document for the expressed purpose that:

"These notes describe the methodologies that the Department of Forestry approves, provides information necessary to use the methodologies and gives direction to counties in evaluating forest productivity reports."

By following the procedures of this document, the State Forester has given tacit approval to the use alternative sources of data upon which the county can make a decision but makes no opinion as to meaningfulness of the data in the context of a local land use proceeding. The document is equally clear that staff of the Department of Forestry will not participate in local land use proceedings:

"Please note the Department of Forestry does not measure forest site productivity for landowners. The Department's involvement is focused on establishing a list of approved data sources and methodologies other than those cited in the administrative rule. The Department of Forestry will not issue findings on whether these data sources or alternate methodologies have been employed correctly or if the resulting forest site productivity determinations are accurate. The Department of Forestry is not responsible for verifying field measurements."

This position is confirmed in email correspondence with ODOF staff dated November 10, 2011 (Exhibit 13):

"Budgets are tight, and the Department of Forestry is not funded to be involved on a case by case basis in land use planning decisions. One of the things we were trying to do with the updated land use planning note was to provide enough information to assist the counties in making these determinations. If a county cannot understand the methodology described in the land use planning note, we will provide training to the county on how to make this type of determination, but we will no longer be making this type of determination for them."

For these reasons, the State Forester has not commented on the report from Marc Setchko.

Having established the subject property does not qualify as forest land due to low soil productivity, attention is now turned to examination of the subjective factors alluded to in LCC 905.930(C). Those factors as set forth in LCC 905.920(A)(5) re-state Goal 4 to require a demonstration that Non-Resource land is not suitable for forest use:

The land is not suitable for commercial forest uses including adjacent or nearby lands which are necessary to permit forest operations or practices on commercial forest lands or other forested lands that maintain soil, air, water and fish and wildlife resources.

The subject property is not suitable for commercial forest uses because it is composed of soils which if subjected to forest harvest and regeneration practices would be severely damaged. It is therefore not site where sustainable forest practices could occur. Marc Setchko refers to the impact of accepted forest practices in his report (Exhibit 12):

"The exceptionally low productivity of the site alone makes it unsuitable for use as commercial forestland. Other limitations exist as well. Shallow soils, high rock content

and poor drainage due to high clay content are not conducive to conifer growth. These conditions also create problems for reforestation of the property. These existing conditions would also be exacerbated by compaction of the thin soils by ground logging, which would further reduce the summertime moisture-holding capabilities need for a one-time reforestation."

The subject property is not suitable as commercial forest land based on the lack of evidence the site was ever stocked to a higher volume or quality of trees that exist today. Marc Setchko refers to stocking in his report (Exhibit 12):

"The above productivity numbers assume a full stocked, unmanaged stand of Douglas-fir covering every acre of the parcel. All productivity numbers are also an average for a particular soil type. These numbers do not take into account different aspects, elevations, moisture availability or soil depth. The exact same soil on a southern aspect will have a lower cubic foot productivity than a northern aspect. The amount of rainfall, i.e., available moisture, will vary considerably in any given area. Higher elevations have shorter growing seasons. A shallow soil depth will inhibit growth, particularly in the later stages (age) of growth. For all these reasons the cubic foot per acre growth of trees will vary greatly from site to site.

For all the above reasons, the parcel in question does not have fully stocked stands covering the entire property. There are several grassy openings; there are no stumps, or any other evidence of trees ever growing in these areas. The soil is very thin in these openings, with only grass and patches of blackberry growing, with exposed rock evident in many places. Large portions of the timbered areas on the parcel are covered with nothing but small scrub oak. Other portions of the timbered areas have widely spaced, short trees. This is further evidence of poor growing conditions and/or conditions not conducive to growing fully stocked stands. The Oregon Department of Forestry has recognized that these conditions create non-stockable areas, which will not grow trees or prevent and/or inhibit the growth of fully stocked timber stands."

There are no adjacent or nearby commercial forest lands that would be affected by the proposed map amendments. Conversely it is not necessary to retain the subject property as resource land because it has not affect on adjacent or nearby commercial forest lands. As noted in findings addressing compatibility with adjacent land uses and impact to the overall land use pattern of the area [LCC 921.874(A)(2)], there are no adjacent forest lands and nearby forestlands are located some distance from the subject property. The subject property does not block access to other forest lands. Low density housing on nearby lands effectively buffer to distant forest lands.

The subject property is not "other forested lands that maintain soil, air, water and fish and wildlife resources." The property contains scattered trees but is not forested as attested by Marc Setchko. Any minimal values derived from maintaining soil, air, water and wildlife resources are those common on a small scale to rural residents and are likely to continue on the property if the proposed map amendments are approved.

Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces: To protect natural resources and conserve scenic and historic areas and open spaces.

Cromwell Map Amendments

The aim of Goal 5 is to protect a broad range of resources. According to Goal 5, the following resources must be inventoried:

- a. Riparian corridors, including water and riparian areas and fish habitat;
- b. Wetlands;
- c. Wildlife Habitat;
- d. Federal Wild and Scenic Rivers;
- e. State Scenic Waterways;
- f. Groundwater Resources;
- g. Approved Oregon Recreation Trails;
- h. Natural Areas;
- i. Wilderness Areas;
- j. Mineral and Aggregate Resources;
- k. Energy sources;
- l. Cultural areas.

Local governments are also encouraged to inventory the following resources:

- a. Historic Resources;
- b. Open Space;
- c. Scenic Views and Sites.

Adopted Linn County Goal 5 inventories do not show significant resources on the subject property. There is no sensitive fish or riparian habitat on the subject property. The National Wetlands Inventory shows no wetlands mapped on the subject property. The property is located within a peripheral big game habitat area. However Section 7, T12S-1W is developed (impacted) and therefore big game habitat is no longer an issue for future development. No other Goal 5 resources are mapped in the vicinity of the subject property. The proposed map amendments will not impact significant Goal 5 resources. Therefore the proposed map amendments comply with Goal 5.

Goal 6, Air, Water and Land Resources Quality: To maintain and improve the quality of the air, water and land resources of the state.

Planning Guideline 2 calls for rural residential uses in areas that are suitable for "approvable sewage disposal alternatives." The USDA NRCS soils maps show Dixonville-Philomath-Hazelair complex (35C and 35E) on the subject property. Use of these soils for septic tank absorption fields is limited due to "depth to bedrock, wetness as a result of the seasonal high water table in the Hazelair soil, and slow permeability. Septic tank absorption fields can be installed in some areas of the Dixonville soil where the depth to bedrock is greater." (Exhibit 10) A sand filter system was approved in two locations on the subject property (Exhibit 14), evidence that the subject property could be improved with two additional dwellings in a manner that is consistent with State law regarding subsurface sewage disposal.

Planning Guideline 4 indicates that plans should be based on the "carrying capacity of the air, land and water resources of the planning area." According to the Oregon Department of Environmental Quality, there are no air or water quality issues associated with the subject property or nearby rural residential development.

Cromwell Map Amendments

Regarding groundwater supply, the Oregon Water Resources Department has 125 well logs on file for wells drilled in T12S-R1W-Sections 7 and 18, the location of the subject property, as tabulated in Exhibit 15. This two-square mile area extends one mile north and south of the subject property and one-half mile east and west. Data from these well logs is compared to the well log for the Cromwell property (Exhibit 16) in the following table.

Table 3, Well Logs for Properties Within a Two Mile Area Around the Subject Property

Value	Depth First Water (ft)	Completed Depth (ft)	Static Water Level (ft)	Maximum Yield (gpm)
Average	137	229	57	25
Median	106	190	38	10
Subject Property	38	85	33	20

Source: Oregon Water Resources Department

A yield of five gpm is typically considered to be the minimum necessary for a site to be buildable. From these data, it is apparent that there is sufficient groundwater for residential use in this area.

For these reasons, the proposed map amendment is consistent with Goal 6.

Goal 7, Areas Subject to Natural Hazards: To protect people and property from natural hazards.

Planning for Natural Hazards: Oregon Technical Resource Guide (Community Planning Workshop for the Oregon Department of Land Conservation and Development, 2000) identifies five natural hazards to be considered in a comprehensive plan: flood, landslide, coastal, wildfire and seismic.

Regional All Hazard Mitigation Master Plan for Benton, Lane, Lincoln and Linn Counties, Phase One (Goettel & Associates Inc. for Oregon Cascades West Council of Governments, 1998) addressed three natural hazards that afflict rural Linn County: floods; winter storms and landslides.

The subject property is not located in a mapped floodplain or landslide prone area. There are no coastal hazards in Linn County. Rural wildfires are most common in the foothills and Cascades. All of Linn County is susceptible to the effects of winter storms such as ice, snow and high winds. Seismic activity is intermittent but the exposure is significant throughout Linn County. Current building codes integrate risk reduction strategies for all new construction to minimize the impact of ice, snow, high winds, and earthquake. For these reasons, the proposed map amendment is consistent with Goal 7.

Goal 8, Recreational Needs: To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Goal 8 does not apply because the proposed map amendment is not intended to satisfy public recreational needs.

Goal 9, Economic Development: To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Cromwell Map Amendments

Goal 9 does not apply because the proposed map amendment is not intended primarily for economic development purposes. However there may be incidental economic benefits in the form of telecommuting and home-based business.

Goal 10, Housing: *To provide for the housing needs of citizens of the state.*

The proposed map amendment would contribute to the inventory of buildable land in rural Linn County with the addition of two more home sites. The proposed map amendment will comply with Goal 10 by contributing to the Linn County housing stock.

Goal 11, Public Facilities and Services: *To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.*

Public facilities and services available to the subject property include fire suppression, law enforcement, and public schools. No public water or sewer is available in this vicinity. Property taxes are levied against the subject property to support the Lebanon Fire District, Linn County Sheriff, and Lebanon Community Schools. School age children in this vicinity currently attend Hamilton Creek Elementary, Seven Oak Middle School, and Lebanon High School. As residential improvements are made to the subject property, the value of the property and the amount of tax collected will both increase to fund the additional need for service. No specific service deficiencies have been identified in this area. Therefore the proposed map amendment is consistent with Goal 11.

Goal 12, Transportation: *To provide and encourage a safe, convenient and economic transportation system.*

The subject property is situated on Hidden Valley Drive between Golden Valley Drive and Berlin Road. This county road is classified as a local road in the transportation system plan. No road capacity or accident issues were identified in this vicinity. Two additional home sites will generate two additional P.M. peak hour trips, according to Trip Generation (ITE, 7th Edition). Therefore the proposed map amendment is consistent with Goal 12.

Goal 13, Energy Conservation: *To conserve energy.*

Homes built under current energy codes are far more energy efficient than homes built only a decade ago. Therefore the proposed map amendment will provide a choice for energy efficient housing for rural residents. Potential building sites on the subject property afford the opportunity to employ solar gain in house design. Rural home sites also provide an opportunity for telecommuters in the evolving economy to stay at home to work. For these reasons, the proposed map amendment complies with the goal to conserve energy.

Goal 14, Urbanization: *To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.*

Goal 14 does not apply because the subject property is not located inside an urban growth boundary.

Cromwell Map Amendments

Goal 15, Willamette River Greenway: *To protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway.*

Goal 15 does not apply because the Willamette River Greenway is not present on the subject property.

Goal 16, Estuarine Resources: *To recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore the long-term environmental, economic, and social values, diversity and benefits of Oregon's estuaries.*

Goal 16 does not apply because no estuarine resources are present on the subject property.

Goal 17, Coastal Shorelands: *To conserve, protect, where appropriate, develop and where appropriate restore the resources and benefits of all coastal shorelands, recognizing their value for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources and recreation and aesthetics. The management of these shoreland areas shall be compatible with the characteristics of the adjacent coastal waters; and to reduce the hazard to human life and property, and the adverse effects upon water quality and fish and wildlife habitat, resulting from the use and enjoyment of Oregon's coastal shorelands.*

Goal 17 does not apply because no coastal shorelands are present on the subject property.

Goal 18, Beaches and Dunes: *To conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beach and dune areas; and to reduce the hazard to human life and property from natural or man-induced actions associated with these areas.*

Goal 18 does not apply because no beaches or dunes are present on the subject property.

Goal 19, Ocean Resources: *To conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations.*

Goal 19 does not apply because no ocean resources are present on the subject property.

ZONING MAP AMENDMENT

A Zoning Map amendment is proposed to change the zoning district for the subject property from Farm/Forest (F/F) to Non-Resource (NR). The decision criteria for a Zoning Map amendment are set forth in LCC 921.822. The applicable criterion is addressed as follows.

(A) When a Zoning Map or Land Development Code text amendment is necessary due to a proposed Comprehensive Plan amendment, only findings and conclusions responding to the Comprehensive Plan amendment criteria for decision are necessary to amend the Zoning Map or Code text provisions.

Concurrent applications were filed for Comprehensive Plan Map Amendment from F/F to NR and Zoning Map Amendment from F/F to NR for the subject property. Those applications were consolidated for purposes of conducting hearings and reaching a decision. Findings and conclusions responding to the Comprehensive Plan amendment criteria are found earlier in this narrative beginning on page 2. Those findings and conclusions are incorporated herein by reference. By providing findings and conclusions responding to the Comprehensive Plan amendment criteria concurrently with the request to amend the Zoning Map, this criterion is met and there is no further obligation to address other decision criteria for Zoning Map amendments set forth in the remainder of LCC 921.822.

///R&a 01/03/12

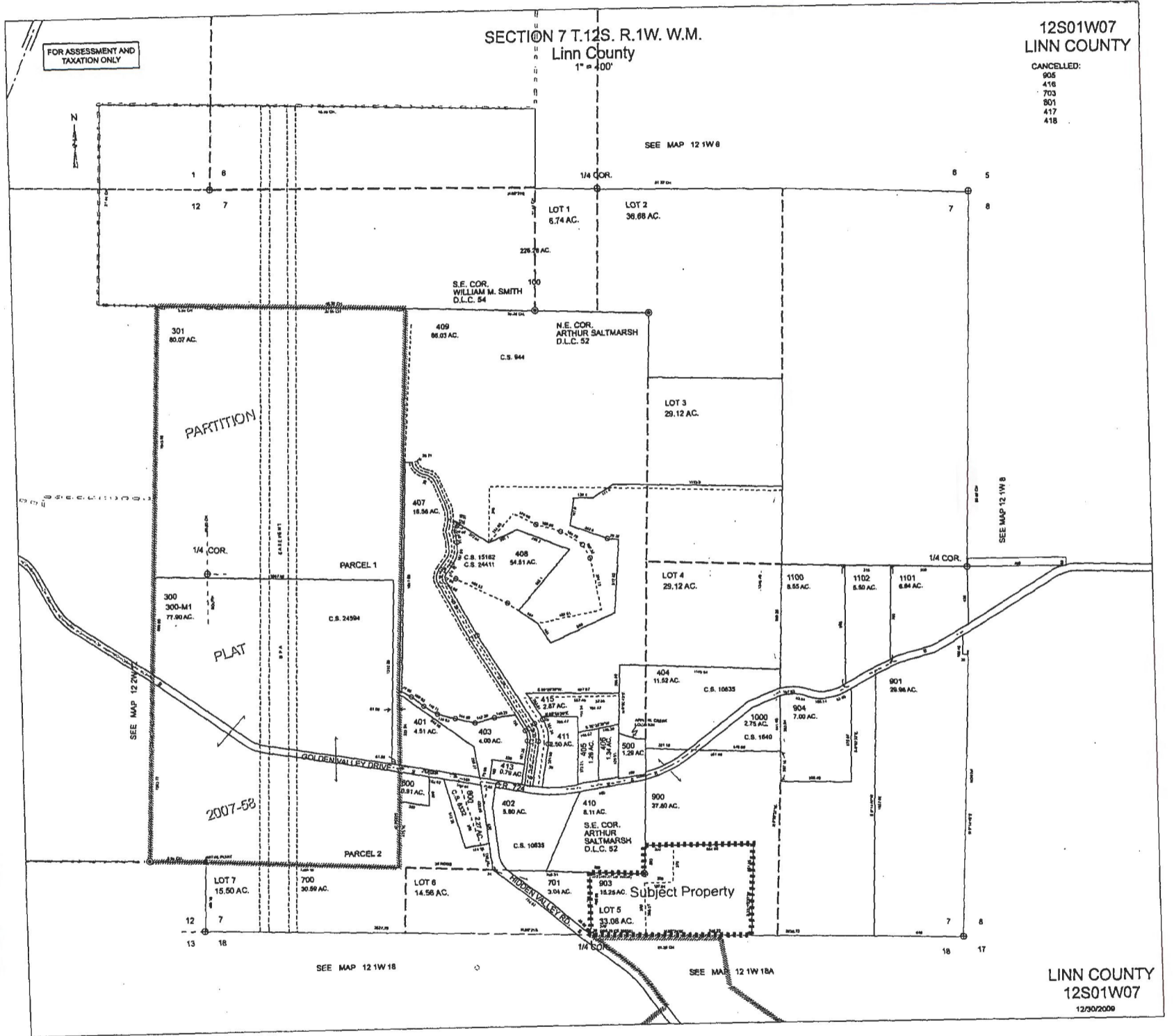


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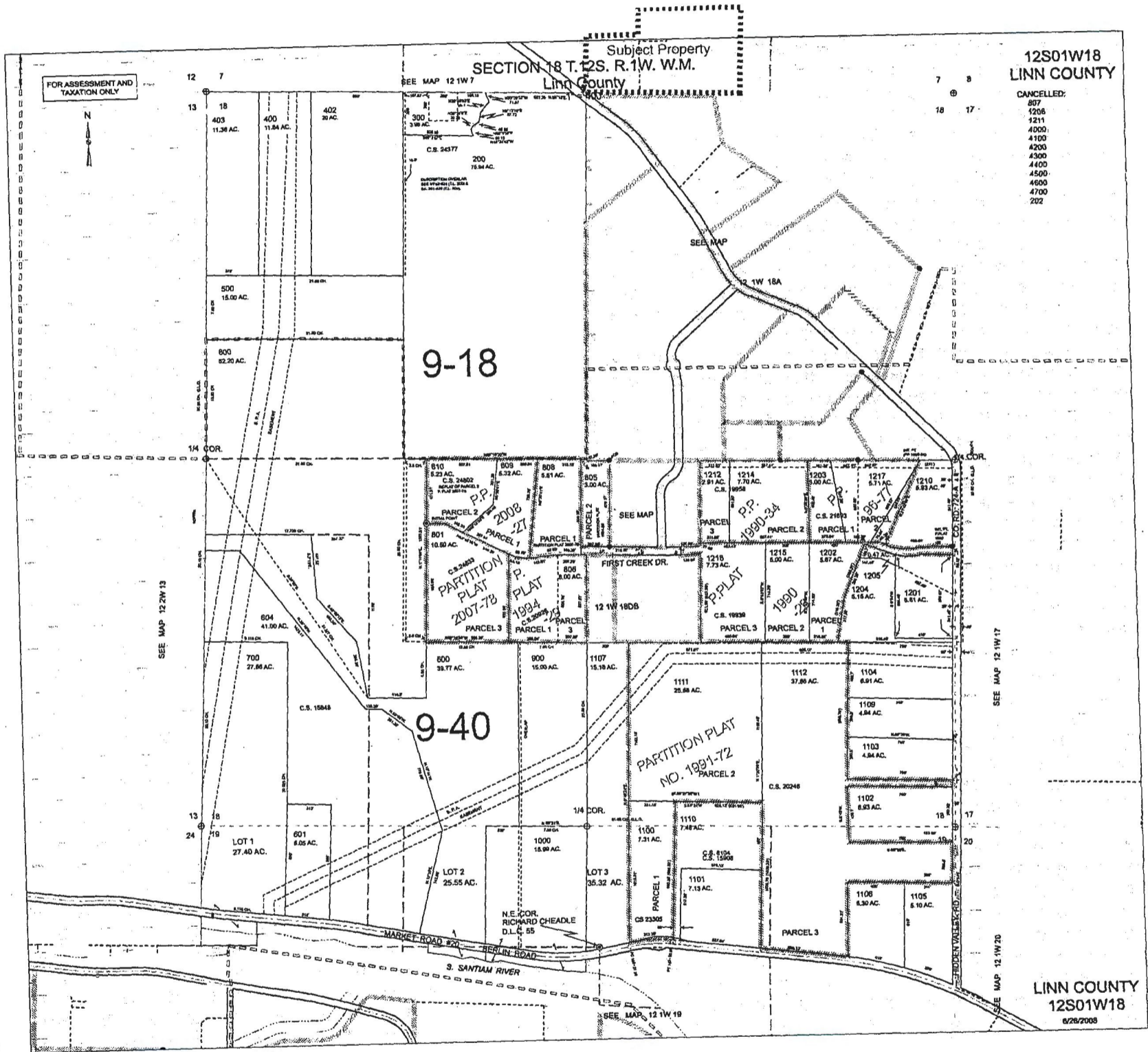


Exhibit 1
Page 2 of 3

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY

Subject Property NE1/4 SEC. 18 T. 12S. R. 01W. W.M. LINN COUNTY, OREGON

12 1W 18A

SEE MAP 12 1W 7

SEE MAP 12 2W 13

SEE MAP 12 1W 17

SEE MAP 12 1W 18

12 1W 18A

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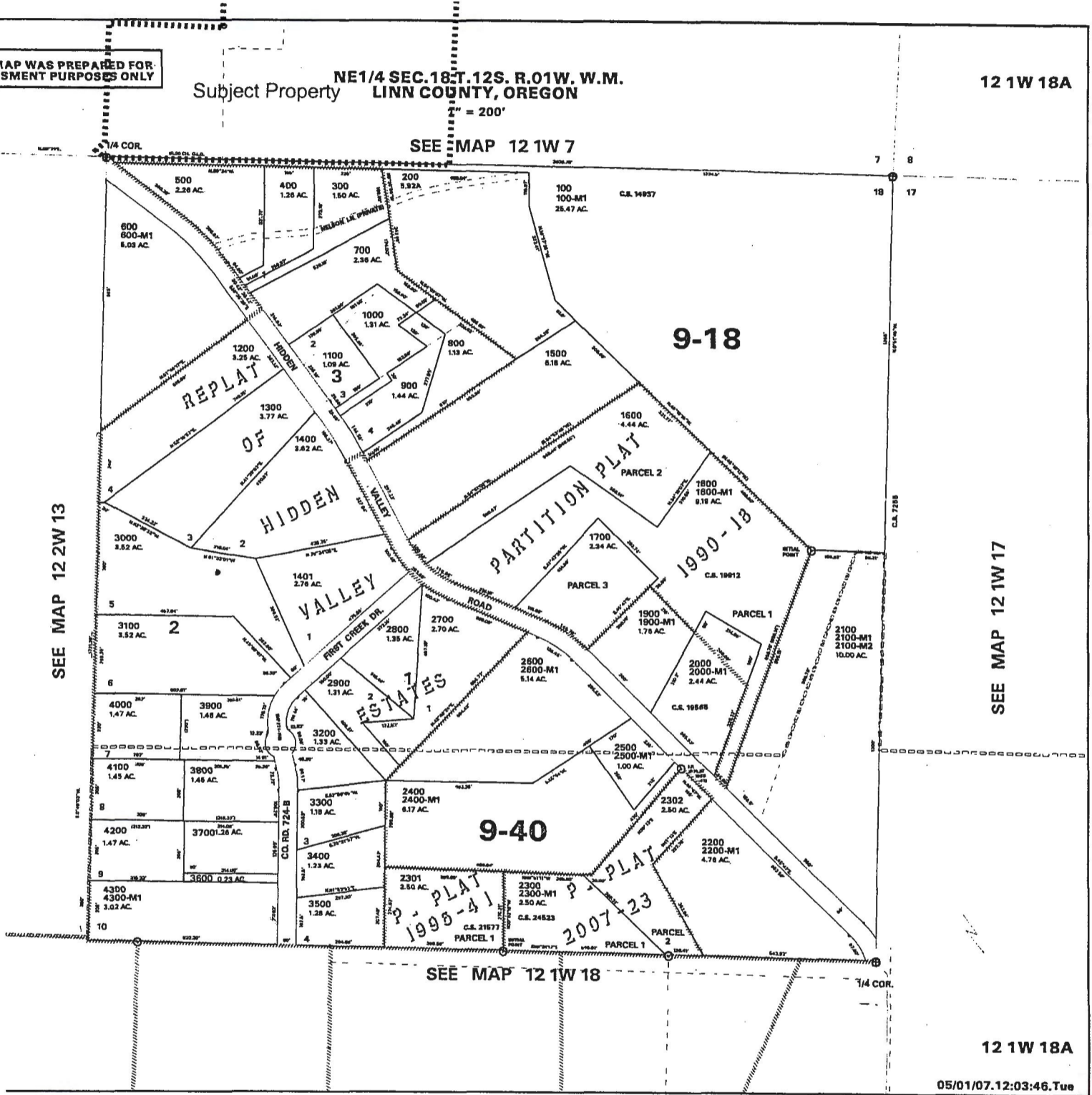


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Zoning Map

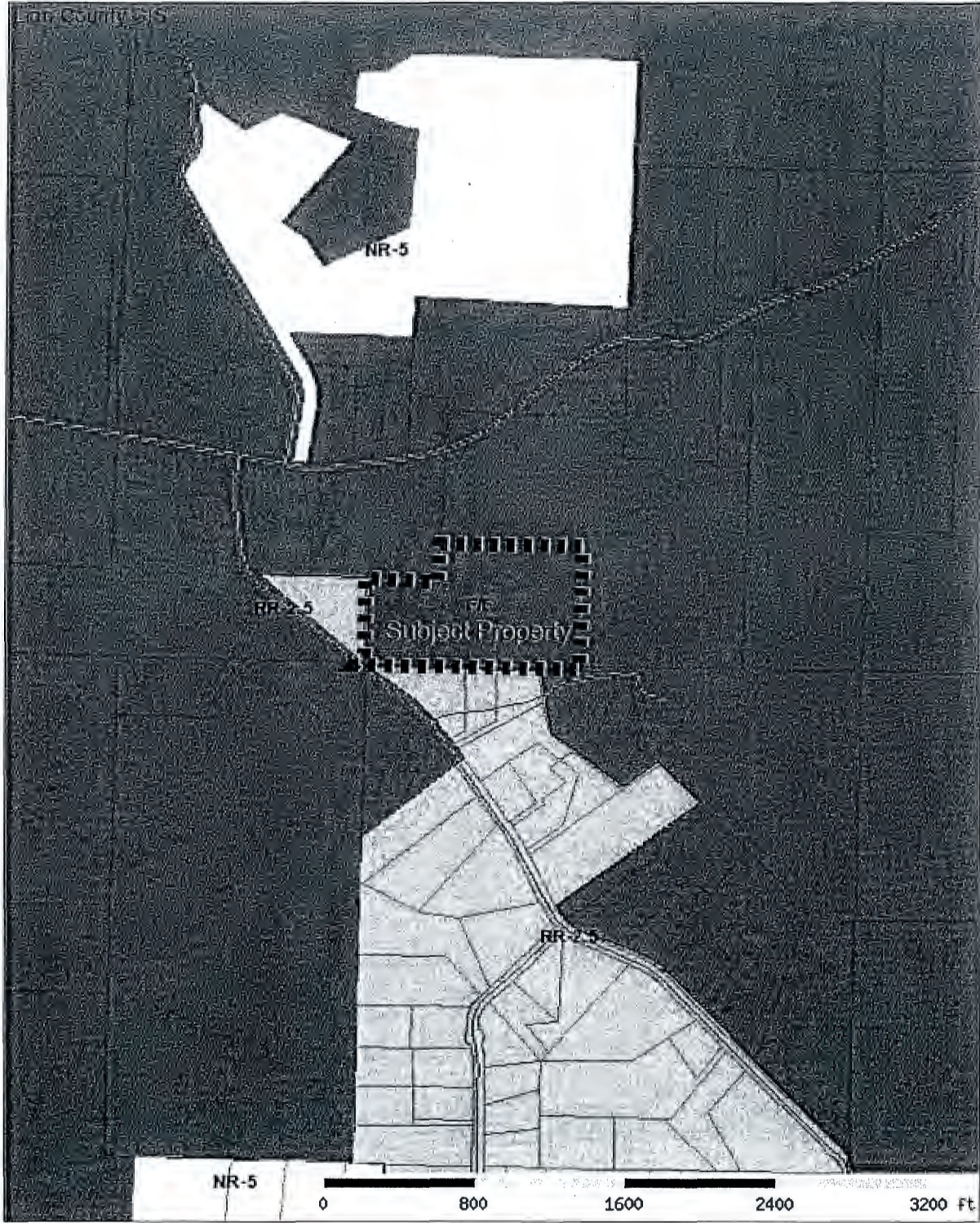
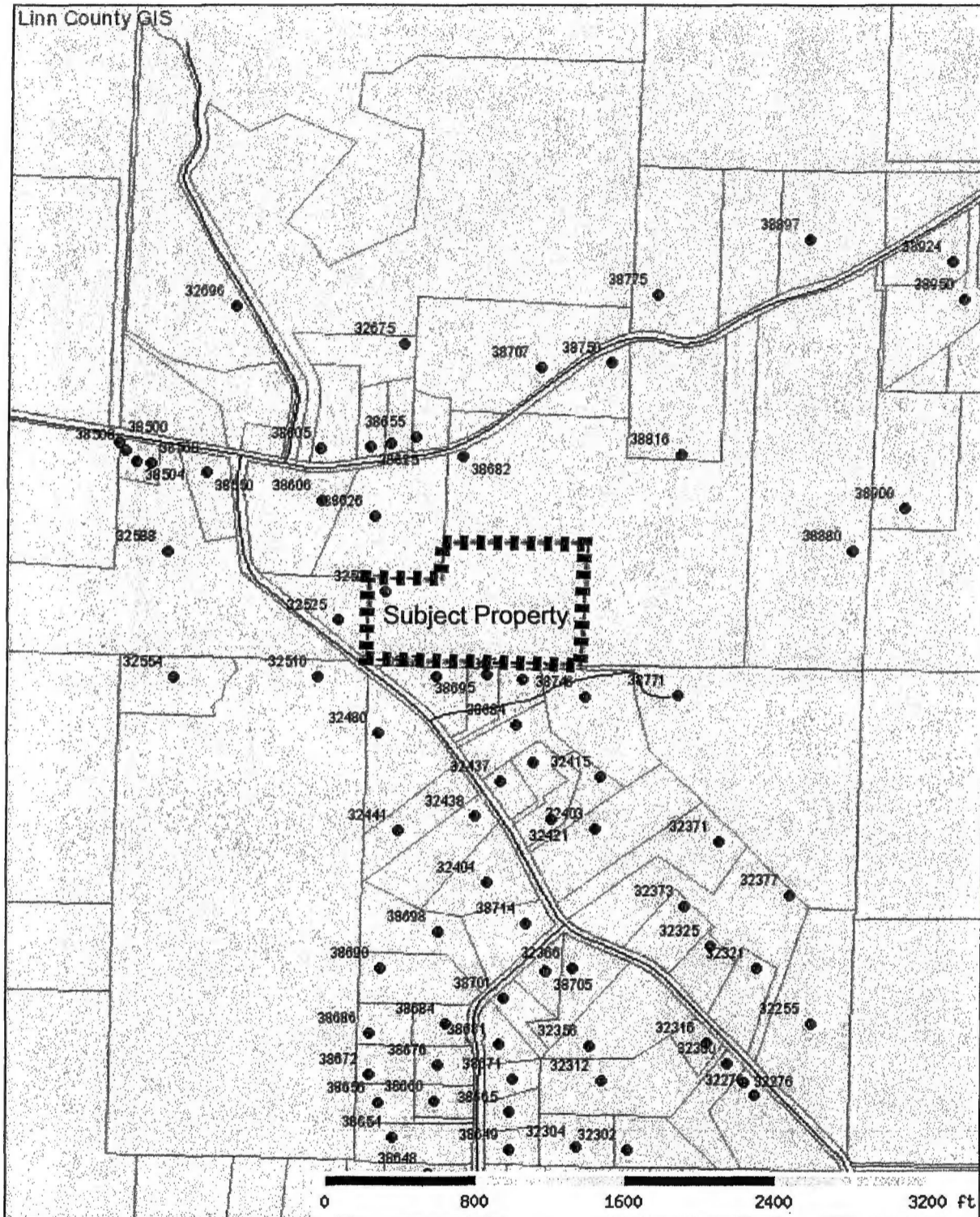


Exhibit 2
Page 1 of 1

Addresses



2008 Orthophoto



Exhibit 4
Page 1 of 1

Tax Lots Within One-Half Mile of the Subject Property
Page 1

ID	MAP TAX LOT	ACRES	ZONING	SITE ADDRESS	IMPROVEMENTS DESCRIPTION	OCCUPANT	DIRECTION	OWNERS
1	12S01W07 00100	226.26	F/F		Hay Cover		North	PAETSCH, BILL D & LOIS L, TR
2	12S01W07 00300	157.89	F/F	38400 GOLDEN VALLEY DR	1955 Single Family Dwelling, 3BR 2BA, 1822 SF	Owner	North	DHILLION, MUKHTIAR S
3	12S01W07 00401	4.51	F/F				North	PULLIAM, CECILE A, TR
4	12S01W07 00402	5.80	F/F	38606 GOLDEN VALLEY DR	1970 Single Family Dwelling, 3BR 1.5BA, 1712 SF	Owner	West	MCDUGAL, MICHAEL D & CINDY J
5	12S01W07 00403	4.00	F/F				North	PULLIAM, CECILE A, TR
6	12S01W07 00404	11.52	F/F		Res Accessory, GP building		North	DILLARD, KENNETH & SYLVIA
7	12S01W07 00405	1.26	F/F	38625 GOLDEN VALLEY DR	1972 Single Family Dwelling, 4BR 2BA, 1878 SF	Owner	North	YODER, LESTER D & JOY G
8	12S01W07 00406	1.34	F/F	38641 GOLDEN VALLEY DR	1970 Single Family Dwelling, 3BR 2BA, 1632 SF	Owner	North	LEWIS, DAWN R
9	12S01W07 00407	16.56	F/F	32696 MERRILL LN	2009 Single Family Dwelling, 3BR 2BA, 1929 SF	Owner	North	JETTE, THOMAS E
10	12S01W07 00408	68.02	NR-5				North	ALLAN C MERRILL CONS. FOR. LLC
11	12S01W07 00409	73.41	F/F	32891 MERRILL LN	1993 Double Wide MH, 3BR 2BA, 1782 SF	Owner	North	MERRILL, ALLAN C & MARY LOU
12	12S01W07 00410	8.11	F/F	38626 GOLDEN VALLEY DR	1997 Single Family Dwelling, 3BR 2BA, 1672 SF	Owner	North	GOSS, DELBERT & DEBBIE L
13	12S01W07 00411	2.50	F/F	38605 GOLDEN VALLEY DR	1979 Double Wide MH, 3BR 2BA, 1680 SF	Owner	North	LOVEALL, RULYN
14	12S01W07 00413	0.79	F/F				North	COPPER MOUNTAIN LLC
15	12S01W07 00415	2.87	F/F	32675 MERRILL LN	1981 Single Family Dwelling, 3BR 2 BA, 1776 SF	Owner	North	EDWARDS, TYLER G & MONICA J
16	12S01W07 00500	1.29	F/F	38655 GOLDEN VALLEY DR	2000 Single Family Dwelling, 3BR 2BA, 1704 SF	Owner	North	MITCHELL, KEVIN L & TRACI C
17	12S01W07 00600	0.91	F/F	38508 GOLDEN VALLEY DR	1997 Double Wide MH, 3BR 2BA, 1120 SF	Owner	West	JAMES, HEROLD K, JR & EDYTHE L
18	12S01W07 00700	33.27	F/F	32588 HIDDEN VALLEY RD	2010 Single Family Dwelling, 3BR 2BA, 1988 SF	Owner	West	PULLIAM, CECILE A, TR
19	12S01W07 00701	3.04	RR-2.5	32525 HIDDEN VALLEY RD	2004 Triple Wide MH, 3BR 2BA, 1566 SF	Owner	West	DARLING, DONALD J & KELLY A
20	12S01W07 00800	1.27	F/F	38550 GOLDEN VALLEY DR	1969 Single Family Dwelling, 3BR 2BA, 2260 SF	Owner	West	MILLER, PHILIP D & ROXY D
21	12S01W07 00900	37.80	F/F	38682 GOLDEN VALLEY DR	1952 Single Family Dwelling, 3BR 1 BA, 912 SF	Owner	East	MASTENBROOK, HARLAN & KATHLEEN E
22	12S01W07 00901	29.96	F/F	38880 GOLDEN VALLEY DR	1978 Single Family Dwelling, 3BR 2BA, 2632 SF	Owner	East	ST MARTIN, KAREN A
23	12S01W07 00903	15.03	F/F	32521 HIDDEN VALLEY RD	1979 Single Family Dwelling, 3BR 2BA, 1536 SF	Subject	Subject	CROMWELL, CAROL L
24	12S01W07 00904	7.00	F/F	38816 GOLDEN VALLEY DR	Machine shed, hay cover		East	FALWELL, ELAINE
25	12S01W07 01000	2.75	F/F	38750 GOLDEN VALLEY DR	1956 Single Family Dwelling, 3BR 2BA, 2342 SF	Owner	East	VORDERSTRASSE, DONALD A & ANITA K
26	12S01W07 01100	8.55	F/F	38775 GOLDEN VALLEY DR	1940 Single Family Dwelling, 3BR 1BA, 780 SF	Owner	North	PARRETT, LORETTA & RONALD D
27	12S01W07 01101	6.84	F/F	38897 GOLDEN VALLEY DR	1993 Single Family Dwelling, 3BR 2.5BA, 2010 SF	Owner	North	THACKER, BLANCHE R
28	12S01W07 01102	5.50	F/F		GP Buildings		North	HARLOW, TERRY ALAN
29	12S01W08 00602	78.74	F/F	39011 GOLDEN VALLEY DR	1974 Single Wide MH w/add'n, 2BR 1BA, 1440 SF	Owner	North	ALEXANDER, HARRIET A
30	12S01W08 00700	3.50	F/F				North	BORNTRAGER, GARY E & ELISABETH
31	12S01W08 00800	39.77	F/F	39012 GOLDEN VALLEY DR	1967 Single Family Dwelling, 2BR 1BA, 1512 SF	Owner	East	RAMSEY, RICHARD H & CHRISTINE L
32	12S01W08 00801	2.61	F/F	38924 GOLDEN VALLEY DR	1929 Single Family Dwelling, 3BR 1 BA, 983 SF	Owner	East	NORRIS, KENNETH W & KATHRYN A
33	12S01W08 00802	5.10	F/F	38950 GOLDEN VALLEY DR	1978 Single Family Dwelling, 3BR 2BA, 2252 SF	Tenant	East	MOLINI, ALICIA E, CO TR
34	12S01W08 00803	15.16	F/F	39004 GOLDEN VALLEY DR	1995 Double Wide MH, 3BR 2BA, 1248 SF	Owner	East	ARNOLD, BILLY R & LORI ANN
35	12S01W08 00804	7.85	F/F		Res Accessory		East	TYMAN, STEVE & SHERYL
36	12S01W08 00809	4.61	F/F	38970 GOLDEN VALLEY DR	1979 Single Family Dwelling, 3BR 3BA, 2108 SF	Owner	East	TAYLOR, ROBERT D & VALARIE K
37	12S01W08 00810	1.00	F/F				East	TAYLOR, ROBERT D & VALARIE K
38	12S01W17 00102	40.00	F/F				East	DENHAM, ALFRED W & MARIA C
39	12S01W17 00104	38.78	F/F	32247 HIDDEN VALLEY RD	1977 Single Wide MH, 2BR 1BA, 784 SF	Tenant	South	DENHAM, ALFRED W & MARIA C
40	12S01W18 00200	78.91	F/F	32510 HIDDEN VALLEY RD	1972 Double Wide MH, 3BR 2BA, 1440 SF	Owner	West	WALKER, THOMAS R
41	12S01W18 00300	1.00	F/F	32554 HIDDEN VALLEY RD	2010 Single Family Dwelling, 2BR 2BA, 1256 SF	Owner	West	PULLIAM, WILLIAM D & DEBRAH L
42	12S01W18 00400	11.64	F/F				West	RICHEY, NADRA J
43	12S01W18 00402	20.00	F/F				West	PULLIAM, CECILE A, TR
44	12S01W18 00403	11.36	F/F	32521 RICHEY RANCH LN	1974 Single Family Dwelling, 3BR 2BA, 2415 SF	Owner	West	RICHEY, NADRA J
45	12S01W18 00500	15.00	F/F				West	WILSON, CRAIG P
46	12S01W18 00800	62.20	F/F				West	WILSON, CRAIG P
47	12S01W18 00801	27.12	F/F	38624 FIRST CREEK DR	2002 Double Wide MH, 3BR 2BA, 1568 SF	Owner	South	HARRIS, WAYNE T & DEBORAH S
48	12S01W18 00805	3.00	F/F	38626 FIRST CREEK DR	1995 Double Wide MH, 3BR 2BA, 1782 SF	Owner	South	GRIFFIN, JAMES D & ELAINE OBRIEN, TR
49	12S01W18A 00100	25.47	F/F	38771 NELSON LN	1977 Double Wide MH, 3BR 2BA, 1782 SF	Owner	South	NELSON, PAUL L & JUDITH A
50	12S01W18A 00200	5.92	F/F	38746 NELSON LN	1996 Single Family Dwelling, 3BR 2.5BA, 2190 SF	Owner	South	WHITE, LEWIS A & LORNA L

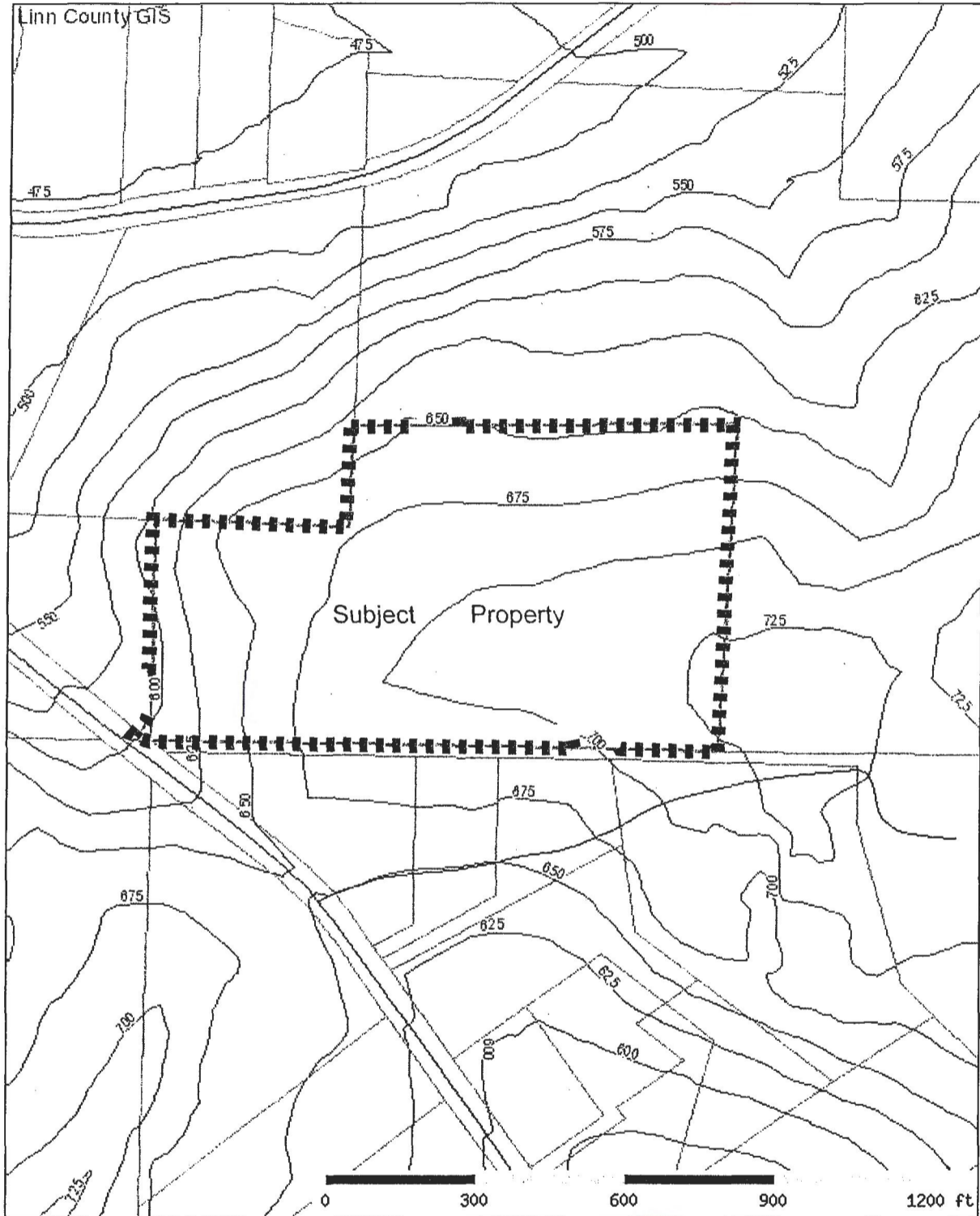
Exhibit 5
 Page 1 of 2

Tax Lots Within One-Half Mile of the Subject Property
Page 2

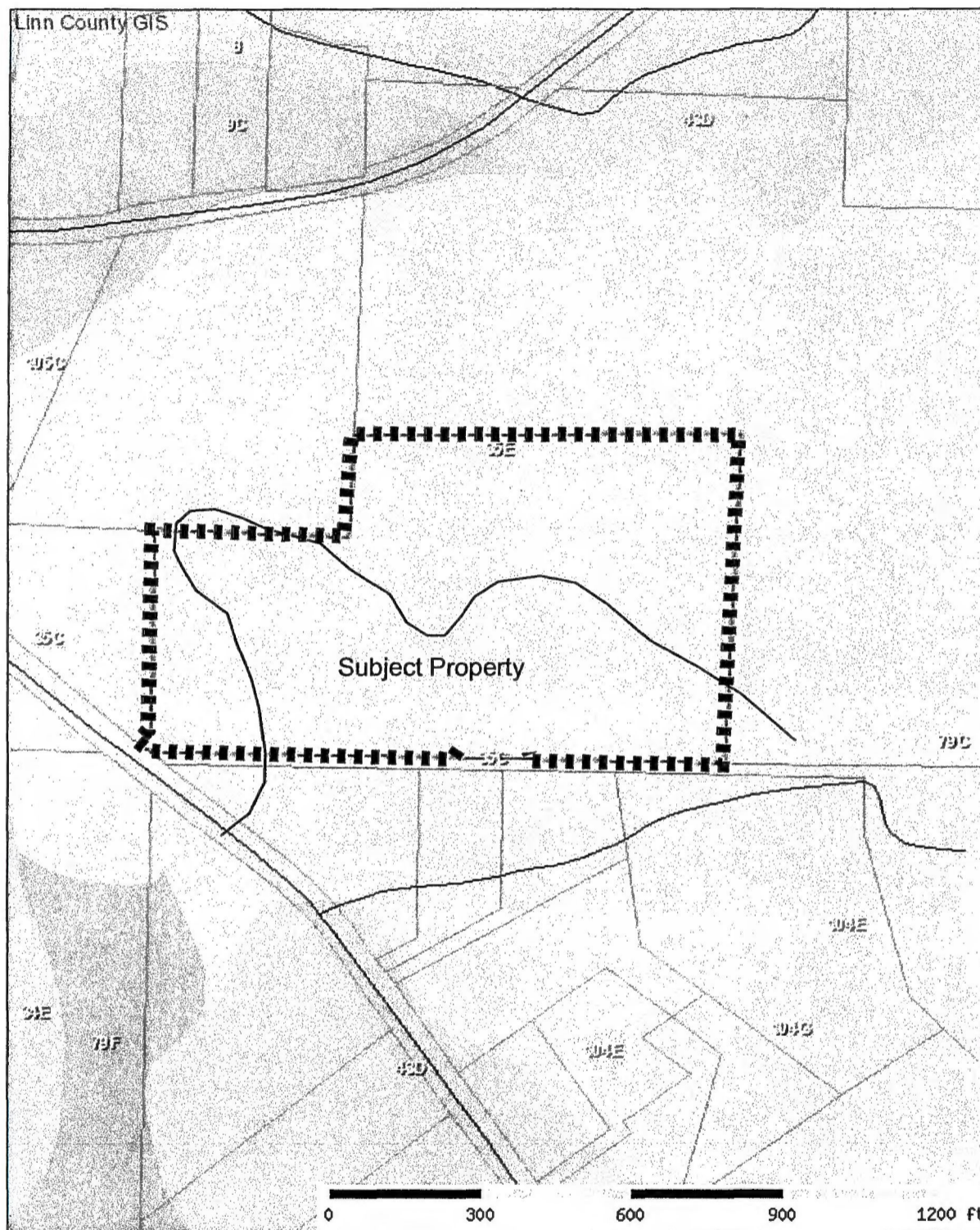
ID	MAP TAX LOT	AGRES	ZONING	SITE ADDRESS	IMPROVEMENTS DESCRIPTION	OCCUPANT	DIRECTION	OWNERS
51	12S01W18A 00300	1.50	RR-2.5	38711 NELSON LN	1997 Single Family Dwelling, 3BR 2BA, 1647 SF	Owner	South	JOYNER, TERRY LEE
52	12S01W18A 00400	1.26	RR-2.5	38695 NELSON LN	1995 Triple Wide MH, 3 BR 2BA, 1568 SF	Owner	South	BEAUDIN, DENNIS P & SHERYL K
53	12S01W18A 00500	2.26	RR-2.5	32479 HIDDEN VALLEY RD	1976 Double Wide MH, 3BR 2BA, 1824 SF	Owner	South	MATIKONIS, CHRISTINE
54	12S01W18A 00600	5.03	F/F	32480 HIDDEN VALLEY RD	1977 Single Family Dwelling, 3BR 2BA, 1632 SF	Owner	South	RUSH, RODNEY
55	12S01W18A 00700	2.36	RR-2.5	38684 NELSON LN	1988 Double Wide MH, 3BR 2BA, 1647 SF	Owner	South	PALMER, WILLIAM E
56	12S01W18A 00800	1.13	RR-2.5	32421 HIDDEN VALLEY RD	1965 Double Wide MH, 2BR 1BA, 940 SF	Tenant	South	PHILLIPS, DICK M & JANICE B
57	12S01W18A 00900	1.44	RR-2.5	32421 HIDDEN VALLEY RD	1990 Double Wide MH, 3BR 2BA, 1848 SF	Owner	South	PHILLIPS, DICK M & JANICE B
58	12S01W18A 01000	1.31	RR-2.5	32431 HIDDEN VALLEY RD	1996 Double Wide MH, 3BR 2BA, 1512 SF	Owner	South	FERCH, SYLVIA & RONEY L
59	12S01W18A 01100	1.09	RR-2.5	32437 HIDDEN VALLEY RD	1996 Double Wide MH, 3BR 2BA, 1404 SF	Owner	South	COLLINS, DEBORAH K
60	12S01W18A 01200	3.25	RR-2.5	32444 HIDDEN VALLEY RD	1999 Single Family Dwelling, 4BR 4.5BA, 3178 SF	Owner	South	SURLES, HENRY E, JR & KATHRYN E
61	12S01W18A 01300	3.77	RR-2.5	32438 HIDDEN VALLEY RD	2004 Single Family Dwelling, 3BR 2BA, 1704 SF	Owner	South	MATHEWS, CLINTON
62	12S01W18A 01400	3.62	RR-2.5	32404 HIDDEN VALLEY RD	1971 Single Family Dwelling, 5BR 3.5BA, 2676 SF	Owner	South	STACKHOUSE, JOHN P & JUDITH A, CO TR
63	12S01W18A 01401	2.76	RR-2.5	38714 FIRST CREEK DR	2003 Double Wide MH, 3BR 2BA, 1728 SF	Owner	South	RAMOS, ALVIN J & SHARON C
64	12S01W18A 01500	6.18	RR-2.5	32403 HIDDEN VALLEY RD	1993 Double Wide MH, 3BR 2BA, 1782 SF	Owner	South	GARDENHOUSE, DONALD L & CYNTHIA L
65	12S01W18A 01600	4.44	F/F	32371 HIDDEN VALLEY RD	1995 Single Family Dwelling, 3BR 2BA, 1129 SF	Owner	South	MEINER, DIANE & SEAN
66	12S01W18A 01700	2.34	F/F	32373 HIDDEN VALLEY RD	1993 Double Wide MH, 3BR 2BA, 1215 SF	Owner	South	ROTH, LEROY D & LEANNE K
67	12S01W18A 01800	9.19	F/F	32377 HIDDEN VALLEY RD	1994 Single Family Dwelling, 2BR 2BA, 1204 SF	Owner	South	WESTLUND, CHARLES A & EVONNA M
68	12S01W18A 01900	1.76	F/F	32325 HIDDEN VALLEY RD	1992 Single Family Dwelling, 3BR 2BA, 1504 SF	Owner	South	RAND, COREY I
69	12S01W18A 02000	2.44	F/F	32321 HIDDEN VALLEY RD	1994 Double Wide MH, 3BR 2BA, 1848 SF	Owner	South	MCGINLEY, DALE M
70	12S01W18A 02100	10.00	F/F	32255 HIDDEN VALLEY RD	1971 Double Wide MH, 3BR 2BA, 1344 SF	Owner	South	FARMER, HERMAN F & JUDITH A
71	12S01W18A 02200	5.29	RR-2.5	32276 HIDDEN VALLEY RD	1999 Triple Wide MH, 3BR 2.5BA, 2673 SF	Owner	South	SHEETS PHILLIP J & LILLIE L
72	12S01W18A 02300	4.47	RR-2.5	32300 HIDDEN VALLEY RD	2002 Single Family Dwelling, 3BR 2BA, 1500 SF	Owner	South	MCCONAGHY, GARY A & NAOMI
73	12S01W18A 02301	2.50	RR-2.5	32304 HIDDEN VALLEY RD	1997 Double Wide MH, 3BR 2BA, 1404 SF	Owner	South	WALDREF, N PAUL
74	12S01W18A 02400	6.17	RR-2.5	32312 HIDDEN VALLEY RD	1985 Single Family Dwelling, 3BR 3BA, 2400 SF	Owner	South	CARLOS, MANUEL A & ELMIRA B
75	12S01W18A 02500	1.00	RR-2.5	32316 HIDDEN VALLEY RD	1970 Double Wide MH, 3BR 2BA, 1568 SF	Tenant	South	CARLOS, ELMIRA B
76	12S01W18A 02600	5.14	RR-2.5	32356 HIDDEN VALLEY RD	1979 Double Wide MH, 2BR 1BA, 1848 SF	Owner	South	RIDDERS, MICHAEL A & DONNA F
77	12S01W18A 02700	2.70	RR-2.5	32366 HIDDEN VALLEY RD	1981 Double Wide MH, 3BR 2BA, 1344 SF	Owner	South	ROSE, MARILYN E
78	12S01W18A 02800	1.35	RR-2.5	38705 FIRST CREEK DR	1977 Double Wide MH, 3BR 2BA, 1440 SF	Owner	South	COMBS, CALVIN P, SR & KATHLEEN
79	12S01W18A 02900	1.31	RR-2.5	38701 FIRST CREEK DR	1999 Double Wide MH, 2BR 1BA, 1269 SF	Owner	South	PINTABONA, TERESA E & BEAMAN RICHARD L
80	12S01W18A 03000	3.98	RR-2.5	38698 FIRST CREEK DR	1988 Double Wide MH, 3BR 2BA, 1404 SF	Owner	South	BOYD, STEVEN D & KIM A
81	12S01W18A 03100	3.52	RR-2.5	38690 FIRST CREEK DR	1983 Double Wide MH, 2BR 1BA, 1152 SF	Owner	South	BOONE, EUGENE H & GERALINE F
82	12S01W18A 03200	1.33	RR-2.5	38681 FIRST CREEK DR	1979 Double Wide MH, 3BR 2BA, 1848 SF	Owner	South	JUSTUS, BILLY R & SUSAN M
83	12S01W18A 03300	1.18	RR-2.5	38671 FIRST CREEK DR	1980 Double Wide MH, 3BR 2BA, 2160 SF	Owner	South	LYON, BARRY C
84	12S01W18A 03400	1.23	RR-2.5	38665 FIRST CREEK DR	1993 Double Wide MH, 3BR 2BA, 1404 SF	Tenant	South	DAVIDSON, THOMAS G & JANICE H
85	12S01W18A 03500	1.28	RR-2.5	38649 FIRST CREEK DR	1995 Double Wide MH, 3BR 2BA, 1782 SF	Owner	South	POELLE, MARCELLA
86	12S01W18A 03600	0.23	RR-2.5				South	CONSER HOMES INC
87	12S01W18A 03700	1.26	RR-2.5	38660 FIRST CREEK DR	1991 Double Wide MH, 3BR 2BA, 1456 SF	Tenant	South	CONSER HOMES INC
88	12S01W18A 03800	1.45	RR-2.5	38676 FIRST CREEK DR	1980 Double Wide MH, 3BR 2BA, 1848 SF	Owner	South	WALKER, STANLEY W & EMILY R
89	12S01W18A 03900	1.48	RR-2.5	38684 FIRST CREEK DR	1984 Double Wide MH, 3BR 2BA, 1232 SF	Tenant	South	MCCLELLAN, WESLEY L & MARLENE C
90	12S01W18A 04000	1.47	RR-2.5	38686 FIRST CREEK DR	1996 Triple Wide MH, 3BR 2BA, 2019 SF	Owner	South	FINSTER, ERIC J & JENNY L
91	12S01W18A 04100	1.45	RR-2.5	38672 FIRST CREEK DR	1987 Double Wide MH, 3BR 2BA, 1539 SF	Owner	South	HUGHSON, CRAIG R & TINA MARIE
92	12S01W18A 04200	1.47	RR-2.5	38656 FIRST CREEK DR	1998 Single Family Dwelling, 3BR 2BA, 1584 SF	Owner	South	HOOPER, PIPER G
93	12S01W18A 04300	3.02	RR-2.5	38654 FIRST CREEK DR	1984 Double Wide MH, 3BR 2BA, 1782 SF	Owner	South	ANTONS, WILLIAM L & MELODY L

Exhibit 5
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25-Foot Interval Contours



NRCS Soils



Vegetation and Land Report on Carol Cromwell Property

Dr. William C. Krueger

2154 SE Powells Road

Corvallis, Oregon 97333

November 14, 2011

Introduction: My comments are based on a visual inspection of the Cromwell property on November 10, 2011. I was able to view the entire 15.25 acres on the ground. My interpretation of the site and its capability is based on 40 years of experience in research, observation and teaching rangeland improvements and livestock grazing management in Western Oregon at Oregon State University, as well as 22 years of raising cattle on my own property in Benton County.

The Cromwell property is on a Dixonville-Philomath-Hazelair soil complex. The Dixonville and Philomath soils are well drained and the Hazelair component is poorly drained but has no wetland vegetation on the site. Much of the property is on fairly steep north facing slopes with a small component on level to gently sloping areas.

Existing vegetation is mostly a mixed stand of Oregon White Oak with a minor component of Douglas fir with an understory of poison oak, blackberry, and hawthorn shrubs. Herbaceous vegetation is a mix of some native perennial grasses, introduced perennial and annual grasses, native and introduced broadleaf plants, mosses and lichens. The onsite native perennial vegetation has low tolerance to grazing pressure. The current vegetation has relatively low forage value. About 1.25 acres (8%) is open grassland dominated primarily by native perennial grasses.

Soil fertility: The soils are low in fertility as evidenced by low productivity of grasses in the grasslands and slow growth of trees on the forested areas. The Dixonville-Philomath-Hazelair complex is a Class VI soil.

Suitability for grazing: The area is capable of supporting cattle or sheep grazing at an extremely low stocking rate. It has been grazed lightly in the past and is fenced. The current fences are in poor repair and are supplemented by an electric fence. Livestock water must come from the domestic well at the house. The property had not been grazed this year. The overstory of the oak provides sufficient shade so that productivity of forage in the understory is nil. The 14 acres of forested land should provide sufficient forage for about one mature cow for one month. The acre and a quarter of grassland should provide sufficient forage for about three cows for one month. The total capacity to sustain livestock grazing is about 4 cow months per year. Grazing at stocking levels higher would put excessive pressure on the perennial grasses and the productivity would deteriorate. Developing the property for grazing would require removal of forest overstory, seeding with improved forage species, fertilization and developing a reliable source of livestock water. The cost would far exceed the potential income from conversion to pasture.

The property is not capable of providing profitable livestock grazing due to its limited productivity and small area. It does not have potential to be developed profitably for livestock grazing.

Climatic conditions: The soils have slow permeability because of their physical structure. The Hazelair soil is poorly drained and holds water near the surface during the rainy months. When the growing season begins the Philomath and Dixonville soils dry rapidly and consequently have a very short growing season. The Hazelair soil dries more slowly and has a slightly longer growing season so the forage matures later. The consequence of this is that forages will be deficient in required nutrients for livestock by early summer (about mid-July) and livestock would need nutritional supplements to maintain productivity.

Existing and future availability of water for farm irrigation purposes: There is no existing water available for irrigation purposes. The well log for the current domestic well indicates the static water level in March was at 33 ft and it pumped 20 gpm for 1 hour exhausting the water supply to the bottom of the well at 85 ft. The recharge potential is not known nor is the availability of water in the summer months. Nevertheless, irrigated pasture under traditional irrigation would require a supply of about 70 gpm for pasture and more for crops so significantly more water would need to be developed for

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irrigated farming. The limited potential to produce forage and crops precludes economical development of irrigation, even if it is possible to drill a well with sufficient yield to irrigate the property.

Existing land use patterns: The property has not been used for livestock grazing as a farm business. The limited past grazing has been for personal desires of the landowner. The land shows no evidence of being farmed or of timber production.

Technological and energy inputs required: Management for existing land uses does not require technological inputs except for access for fire prevention and management in the event of a fire. The limited grazing uses a single wire electric fence in some areas of the property.

Accepted farming practices: Foothills in the Willamette Valley are primarily used for pasture, woodlots or Christmas tree production. Grapes, berries and tree fruits are grown on some soils but require substantial inputs in irrigation and fertilization. The slopes and poor agricultural soils on most of the property limit any row crop uses. In order to convert the property to Christmas tree or any crop the overstory of white oak and the stumps would need to be removed. This would be very expensive and open some slopes to hazards from erosion.

Because of its small size, lack of irrigation water and poor soils the area is not capable of supporting any economical farming enterprise.

The land is not necessary to permit farm practices to be undertaken on adjacent or nearby agricultural lands: No surrounding land is farmed.

Conclusion: Commercial uses of the property for agricultural purposes would not be economical or practical due to inherent limitations of the property.

W. Spruce

Name: William C. Krueger

Address: 2154 SE Powells Road, Corvallis, Oregon 97333

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e-mail: wckpmk1944@gmail.com

Terminal Degree: Ph.D., Range Ecology, Utah State University, 1970

Title and Specialization: Professor and Department Head (emeritus)—Riparian Ecology and Grazing Management

Department/Location: Rangeland Ecology and Management, Oregon State University, Corvallis

Experience: Total years of research, teaching and extension: 40 (retired 2007)

<u>Dates</u>	<u>Employer</u>	<u>Title</u>	<u>Nature of Work</u>
1965-67	Humboldt State College	Research Assistant	Plants/Soil relations research
1967-70	Utah State University	Teaching Assistant	Plant ecology and watershed teaching
1967-70 (summers)	Intermountain For. & Range Exp. Station	Range Research Technician	Ecology and management of forb communities
1970-71	Humboldt State College	Assistant Professor	Teach range ecology and management
1971-75	Oregon State University	Assistant Professor	Teaching, extension, research in range ecology
1975-80	Oregon State University	Associate Professor; Program Leader	Teaching, research, extension, international, administration in rangeland resources
1980-81	Colorado State Univ.	Professor & Head	Teaching, research, extension, administration in range science
1989-90	Oregon State University	Agricultural Program Leader	Administration of Agricultural Extension Programs—half time
1981-2007	Oregon State University	Professor & Head	Teaching, research, extension, international, administration in rangeland resources

Projects and Grants:

<u>Dates</u>	<u>Source</u>	<u>Funding</u>	<u>Location</u>	<u>Nature of Work</u>
1974-82	U.S. Forest Ser.	\$216,000	Eastern Oregon	Livestock grazing in riparian zones and pulmonary emphysema
1979-82	Dow Chemical	\$2,000	Eastern Oregon	Sagebrush and rabbitbrush control
1978-83	U.S. Forest Ser.	\$82,000	Eastern Oregon	Livestock grazing and riparian zones
1979	Ag. Res. Found.	\$6,000	Eastern Oregon	Range plant root studies
1982-89	USAID	\$5.4 million	Tunisia	Rangeland revegetation and management (with D. Johnson)
1984	USAID	Consulting	Morocco	Evaluation of arid land revegetation program
1984-93	National Park Service	\$247,000	Col. Plateau, Eastern Oregon	Rangeland Revegetation (with L. Larson and B. Kauffman)

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1984-86	OR Fish & Wldl.	\$26,000	Western Oregon	Elk habitat
1984-89	BLM	\$162,000	Southern Oregon	Plantation grazing (with P. Doescher)
1989-96	BLM/NBS	\$1,867,619	Oregon/Great Basin	Improving vegetation diversity (12 cooperators)
1989-96	U.S. Forest Service	\$481,327	Eastern Oregon	Ecology of herbivores/elk winter range/assessment of FS operations
1992-95	USDA/CSRS	\$173,967	Eastern Oregon	Sustainable ranching-riparian (with J. Buckhouse)
1971-95	Ag. Exp. Station	Variable State	Oregon	Basic studies in riparian zone ecology, agroforestry, and revegetation
1979, 1980, 85 1993	Kuwait Institute for Scientific Research	Consulting	Kuwait	Assist in development of national research program for revegetation of arid rangelands
1997-99	State (GWEB)	\$500,000	Eastern Oregon	Environmental and management impacts on stream temperature
2004	NorthPacific grp. and Round Butte Seed	\$1,700	Lab Work	Allelopathy in Western Juniper
2005	OSU Vet Med Round Butte Seed North Pacific grp Crook County	\$11,600	Lab Work	Allelopathy in Western Juniper
2006	NRCS	\$18,500	Eastern Oregon	State and Transition Thresholds in Ponderosa Pine

Publications, Abstracts & Invited Symposia Papers:

Total publications and abstracts: 182 Number in refereed journals: 67
Number of invited papers: 43 Number of books or book chapters: 2

Awards and Recognition:

<u>Title</u>	<u>Year</u>	<u>Source</u>	<u>Nature of Award/Recognition</u>
Board of Directors	1976-79	PNW Section, SRM	Leadership
President	1985	PNW Section, SRM	Leadership
Distinguished Alumnus	1986	Humboldt State Univ.	Career Accompl.
Rosenfeld Distinguished Professor of Ag. Sci.	1986	Oregon State Univ.	Career Accompl.
Certificate of Appreciation	1987	U.S. Forest Service	Research Contributions
Outstanding Service Award	1989	PNW Section, SRM	Watershed Imprc
Cert. of Commendation	1989	SRM	Research Affairs

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Environmental Achievement Award	1990	National Environmental Awards Council	Watershed Improvement
FUN EP 500 Award	1990	Friends of the U. N. Environment Program	Watershed Improvement
Rip. Stewardship Award	1990	BLM	Watershed Improvement
Outstanding Achievement Award	1991	SRM	Watershed Improvement
Robert Rodale National Achievement Award	1991	National Environmental Awards Council	Watershed Improvement
Voice of the Cattle Industry	1992	Portland Chamber of Commerce, Cattlemen Ass.	Service to development of cattle industry
Trail Boss Award	1993	PNW Section, Society for Range Management	Career accomplishments Top regional award
Environmental Achievement	1994	National Environmental Awards Council	Certificate of Environmental Achiev.
Outstanding Service	1994	Society of American Foresters	Outstanding Service to SAF-Assoc. Ed. WJAF
Environmental Achievement	1995	Renew America	Oregon Watershed Improvement Coalition
Twenty Five Years Service	1995	Epsilon Sigma Chi	Extension Service
Certification of Appreciation	1996	Rogue River National Forest	Finding Solutions to Range Problems
Merit Achievement	1997	Utah State Univ. Alumni Assoc.	Career Accomplishment
Environmental Achievement	1997	Renew America	Oregon Watershed Improvement Coalition
Research Award	1998	Sigma Xi	Riparian Research
Environmental Achievement	1998	Governor's Watershed Enhancement Board	Oregon Watershed Improvement Coalition
Appreciation Award	2001	Oregon Cattlemen's Assoc	Science to support management for cattle production and env. Sustainability
Appreciation Award	2002	Oregon Watershed Enhancement Board	Service in reviewing technical materials
Fellow Award	2003	Society for Range Management	Career Accomplishments
Frederick G. Renner Award	2005	Society for Range Management	Highest Award given by SRM: career award

660-006-0010

Identifying Forest Land

(1) Governing bodies shall identify "forest lands" as defined by Goal 4 in the comprehensive plan. Lands inventoried as Goal 3 agricultural lands, lands for which an exception to Goal 4 is justified pursuant to ORS 197.732 and taken, and lands inside urban growth boundaries are not required to be planned and zoned as forest lands. Lands suitable for commercial forest uses shall be identified using a mapping of average annual wood production capability by cubic foot per acre (cf/ac) as reported by the USDA Natural Resources Conservation Service.

(2) Where NRCS data are not available or are shown to be inaccurate, other site productivity data may be used to identify forest land, in the following order of priority:

(a) Oregon Department of Revenue western Oregon site class maps;

(b) USDA Forest Service plant association guides; or

(c) Other information determined by the State Forester to be of comparable quality.

(3) Where data of comparable quality under subsections (2)(a)-(c) are not available or are shown to be inaccurate, an alternative method for determining productivity may be used as described in the Oregon Department of Forestry's Technical Bulletin entitled "Land Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010."

vegetation and is a potential source of sedimentation. Hauling away waste material minimizes damage to the soil and to the plant cover downslope of roadbuilding sites.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy periods. Wheeled and tracked equipment can be used in the more gently sloping areas, but cable yarding generally is safer and disturbs the soil less. Highlead logging or other logging systems that fully or partially suspend logs damage the soil less and generally are less costly than tractor systems. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Ripping skid trails and landings when the soil is dry improves the growth of trees. Road location and maintenance costs are greater in the more steeply sloping areas.

The soil in this unit is subject to landsliding and slumping when saturated, because it is very plastic and is underlain by highly fractured bedrock.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which can prevent natural or artificial reforestation. Competing weeds, brush, or trees can be controlled by spraying, cutting, girdling, or scarifying. Scarification is less suitable in the steeper areas because of increased expense and soil displacement.

Trees suitable for planting on this unit include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

This map unit is in capability subclass VIe.

35C-Dixonville-Philomath-Hazelair complex, 3 to 12 percent slopes. This map unit is on low foothills adjacent to the Willamette Valley. The vegetation in areas not cultivated is mainly conifers, hardwoods, shrubs, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

This unit is about 30 percent Dixonville silty clay loam, 30 percent Philomath silty clay, and 30 percent Hazelair silty clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Ritner and Witzel soils and Dixonville, Philomath, and Hazelair soils

that have slopes of more than 12 percent. Also included are small areas of Rock outcrop and Orthents. Included areas make up about 10 percent of the total acreage.

The Dixonville soil is moderately deep and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very dark grayish brown silty clay loam about 12 inches thick. The subsoil is dark brown clay about 14 inches thick. Weathered basalt is at a depth of 26 inches.

Permeability of this Dixonville soil is slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Philomath soil is shallow and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very dark brown silty clay about 4 inches thick. The next layer is very dark brown and very dark grayish clay about 15 inches thick. Weathered basalt is at a depth of 19 inches. In some areas of similar soils, the surface layer is cobbly silty clay.

Permeability of this Philomath soil is slow. Available water capacity is about 2 to 4 inches. Depth to soft bedrock and effective rooting depth are 12 to 20 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Hazelair soil is moderately deep and is moderately well drained to somewhat poorly drained. It formed in stratified medium textured and moderately fine textured colluvium derived from mixed sources and overlying older, very clayey material that is underlain by sedimentary bedrock. Typically, the surface layer is very dark grayish brown silty clay loam about 5 inches thick. The subsoil is very dark grayish brown silty clay about 10 inches thick. The substratum is variegated yellowish brown and light yellowish brown, mottled clay about 19 inches thick. Weathered siltstone is at a depth of 34 inches.

Permeability of this Hazelair soil is very slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate. A seasonal high water table is at a depth of 1 foot to 2 feet from December to April.

This unit is used mainly for hay and pasture. It is also used for homesite development, wildlife habitat, and recreation. A few areas of the Dixonville soil are used for timber production.

If this unit is used for hay and pasture, the main limitations are wetness of the Hazelair soil because of the seasonal high water table, the shallow depth to bedrock in the Philomath soil, and the high clay content. Drainage is needed if the Hazelair soil is to be used to its maximum potential.

The soils in this unit are sticky and plastic when wet, which restricts trafficability. Conducting field operations

during periods when the soils are wet reduces till and destroys structure, which results in increased runoff and erosion. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching. Grazing when the soils are moist results in compaction of the surface layer, poor till, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soils from erosion.

The intricate pattern of the shallow and droughty Philomath soil, the moderately deep and well drained Dixonville soil, and the moderately well drained to somewhat poorly drained Hazelair soil make cultivation of this unit difficult. It is restricted dominantly to small gardens.

Use of fertilizer promotes good growth of forage plants. Grasses respond to nitrogen, and legumes respond to phosphorus, boron, sulfur, and lime.

This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, the potential production per acre is 6,900 cubic feet from an even-aged, fully stocked stand of trees 60 years old or 63,900 board feet (International rule, one-eighth-inch kerf) from an even-aged, fully, stocked stand of trees 90 years old. On the basis of a 50-year site curve, the mean site index is 100. Douglas-fir, grand fir, and Oregon white oak commonly grow on this unit. The main concerns in producing and harvesting timber are equipment limitations, seedling mortality, and plant competition.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy periods. If wheeled and tracked equipment is used on this unit when the soil is moist, puddling and compaction occur. Compaction seriously reduces the productivity of the soil. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Using vehicles that have large, low-pressure tires reduces damage to the soil and helps to maintain productivity. Ripping skid trails and landings when the soil is dry improves the growth of trees.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which can prevent natural or artificial reforestation. Competing weeds, brush; or trees can be controlled by spraying, cutting, girdling, or scarifying.

Trees suitable for planting on the Dixonville soil include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

If this unit is used for homesite development, the main limitations are shallow depth to bedrock, wetness, slow permeability, low soil strength, and shrink-swell potential. Costs of construction to overcome these limitations is high. Construction of houses and roads should be restricted to areas of the Philomath and Dixonville soils. Cuts needed to provide essentially level building sites can expose bedrock. Cutbanks are subject to slumping when the soil is saturated. The bedrock is rippable and therefore is not a serious limitation for most engineering uses.

This unit is poorly suited to septic tank absorption fields because of depth to bedrock, wetness as a result of the seasonal high water table in the Hazelair soil, and slow permeability. Septic tank absorption fields can be installed in some areas of the Dixonville soil where the depth to bedrock is greater. The limitation of slow permeability can be overcome by increasing the size of the absorption field.

Roads and streets can be built if they are designed to compensate for the limited ability of the soils in this unit to support a load. Settling can be minimized by compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling.

If buildings are constructed on this unit, properly designing foundations and footings and diverting runoff away from the buildings help to prevent structural damage because of shrinking and swelling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

This map unit is in capability subclass VI.

35E-Dixonville-Philomath-Hazelair complex, 12 to 35 percent slopes. This map unit is on low foothills adjacent to the Willamette Valley (fig. 5). The vegetation in areas not cultivated is mainly conifers, hardwoods, shrubs, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

This unit is about 30 percent Dixonville silty clay loam, 30 percent Philomath silty clay, and 30 percent Hazelair silty clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Ritner and Witzel soils and Dixonville, Philomath, and Hazelair soils that have slopes of less than 12 percent. Also included are small areas of Rock outcrop and Orthents. Included areas make up about 10 percent of the total acreage.

The Dixonville soil is moderately deep and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very



Figure 5.-Typical area of Dixonville-Philomath-Hazelair complex, 12 to 35 percent slopes, on the foot slopes of Rogers Mountain.

dark grayish brown silty clay loam about 12 inches thick. The subsoil is dark brown clay about 14 inches thick. Weathered basalt is at a depth of 26 inches.

Permeability of this Dixonville soil is slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is medium, and the hazard of erosion is moderate to high.

The Philomath soil is shallow and well drained. It formed in colluvium derived dominantly from basic igneous rock.

Typically, the surface layer is very dark brown silty clay about 4 inches thick. The next layer is very dark brown and very dark grayish brown clay about 15 inches thick. Weathered basalt is at a depth of 19 inches. In some areas of similar soils, the surface layer is cobbly silty clay.

Permeability of this Philomath soil is slow. Available water capacity is about 2 to 4 inches. Depth to soft bedrock and effective rooting depth are 12 to 20 inches.

Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Hazelair soil is moderately deep and moderately well drained to somewhat poorly drained. It formed in stratified, medium textured and moderately fine textured colluvium derived from mixed sources and overlying older, very clayey material that is underlain by sedimentary rock. Typically, the surface layer is very dark grayish brown silty clay loam about 5 inches thick. The subsoil is very dark grayish brown silty clay about 10 inches thick. The substratum is variegated yellowish brown and light yellowish brown, mottled clay about 19 inches thick. Weathered siltstone is at a depth of 34 inches.

Permeability of this Hazelair soil is very slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is medium, and the hazard of erosion is moderate.

to high. A seasonal high water table is at a depth of 1 foot to 2 feet from December to April.

This unit is used mainly for hay and pasture. It is also used for homesite development, wildlife habitat, and recreation. A few areas of the Dixonville soil are used for timber production.

If this unit is used for hay and pasture, the main limitations are wetness of the Hazelair soil, because of the seasonal high water table, the shallow depth to bedrock in the Philomath soil, the high clay content, and slope in some areas. Drainage is needed if the Hazelair soil is to be used to its maximum potential.

The soils in this unit are sticky and plastic when wet, which restricts trafficability. Conducting field operations during periods when the soils are wet can reduce soil tilth and destroy structure, which results in excessive runoff and increased erosion. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching. All tillage should be on the contour or across the slope. Grazing when the soils are wet results in compaction of the surface layer, poor tilth, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from erosion.

The intricate pattern of the shallow and droughty Philomath soil, the moderately deep and well drained Dixonville soil, and the moderately well drained to somewhat poorly drained Hazelair soil makes cultivation of this unit difficult. It is restricted dominantly to small gardens in the less sloping areas.

Use of fertilizer promotes good growth of forage plants. Grasses respond to nitrogen, and legumes respond to phosphorus, boron, sulfur, and lime.

This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, the potential production per acre is 6,900 cubic feet from an even-aged, fully stocked stand of trees 60 years old or 63,900 board feet (International rule, one-eighth-inch kerf) from an even-aged, fully stocked stand of trees 90 years old. On the basis of a 50-year site curve, the mean site index is 100. Douglas-fir, grand fir, and Oregon white oak commonly grow on this unit. The main concerns in producing and harvesting timber are the hazard of erosion, equipment limitations, seedling mortality, and plant competition.

When harvesting timber on this unit, it is essential to use management that minimizes erosion. Erosion can be minimized by not disturbing the soil excessively while logging; by seeding roads, cutbanks, and landings; and by installing water bars or culverts. Proper design of road drainage systems and care in the placement of culverts help to control erosion. Because spoil from excavations is subject to rill and gully erosion and to sloughing, it should be seeded to permanent plant cover.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy

periods. If wheeled and tracked equipment is used on this unit when the soil is moist, puddling and compaction occur.

Compaction seriously reduces the productivity of the soil. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Using vehicles that have large, low-pressure tires reduces damage to the soil and helps to maintain productivity. Ripping skid trails and landings when the soil is dry improves the growth of trees.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which prevent natural or artificial reforestation. Competing weeds, brush, or trees can be controlled by spraying, cutting, girdling, or scarifying.

Trees suitable for planting on the Dixonville soil include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

If this unit is used for homesite development, the main limitations are shallow depth to bedrock, wetness of the Hazelair soil, because of the seasonal high water table slow permeability, slope, low soil strength, and shrink-swell potential. Cost of construction to overcome these limitations is high. Construction of houses and roads should be restricted to areas of Philomath and Dixonville soils.

Cuts needed to provide essentially level building sites can expose bedrock. Cutbanks occasionally slump when the soils in this unit are saturated. The bedrock is rippable and therefore is not a serious limitation for most engineering uses.

The soils in this unit are poorly suited to septic tank absorption fields because of the depth to bedrock, wetness of the Hazelair soil, the seasonal high table, slow permeability, and slope. Septic tank absorption fields may be installed in some areas of the Dixonville soil where the depth to bedrock is greater and the areas are less sloping. The limitation of slow permeability may be overcome by increasing the size of the absorption field. Absorption lines should be installed on the contour.

Slope limits use of the steeper areas of this unit for building site development. Steepness of slope and high content of clay in the subsoil are limitations for dwellings and commercial buildings.

Roads and streets can be built if they are designed to compensate for the limited ability of the soils in this unit to support a load. Settling can be minimized by

Exhibit 10

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compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling.

If buildings are constructed on this unit, properly designing foundations and footings and diverting runoff away from the buildings help to prevent structural damage because of shrinking and swelling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

This map unit is in capability subclass VI.

36D-Dupee silt loam, 3 to 20 percent slopes. This deep, somewhat poorly drained soil is in depressional areas and drainageways of foothills and on alluvial fans. It formed in mixed colluvium derived dominantly from sedimentary rock. The vegetation in areas not cultivated is mainly conifers, hardwoods, sedges, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

Typically, the surface layer is very dark brown silt loam about 4 inches thick. The next layer is very dark brown silty clay loam about 7 inches thick. The upper 14 inches of the subsoil is brown silty clay loam, and the lower 11 inches is brown silty clay. The substratum to a depth of 65 inches is light olive gray and light gray clay. In some areas of similar included soils, weathered sedimentary rock is at a depth of 40 to 60 inches.

Included in this unit are small areas of Belpine, Hazelair, Panther, and Willakenzie soils. Included areas make up about 15 percent of the total acreage.

Permeability of this Dupee soil is moderately slow. Available water capacity is 9 to 13 inches. Effective rooting depth is 60 inches or more; however, penetration of roots is restricted by dense clay and a seasonal high water table. Runoff is slow to medium, and the hazard of erosion is slight to high. A seasonal high water table is at a depth of 1.5 to 3.0 feet from December to April.

This unit is used mainly for hay and pasture, small grain, orchards, and limited timber production. It is also used for homesite development, wildlife habitat, and recreation.

If this unit is used for hay and pasture, the main limitations are wetness and the moderately slow permeability of the subsoil. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from erosion. Proper grazing practices, weed control, and fertilizer are needed to ensure maximum quality of forage.

If this unit is used for grain and orchard crops, the main limitations are wetness and slope. Drainage is needed if this unit is to be used to its maximum potential. Unless the unit is drained, long-lived, deep-rooted

deciduous fruit and nut trees, strawberries, caneberries, and alfalfa are adversely affected by the seasonal high water table. Tile drainage can be used to reduce wetness if a suitable outlet is available.

The risk of sheet and rill erosion on the steeper slopes can be reduced by use of gradient terraces and contour farming. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching.

In summer, irrigation is needed for maximum production of most crops. Sprinkler irrigation can be used, but water needs to be applied slowly to minimize runoff.

Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Grain and grasses respond to nitrogen; legumes respond to phosphorus, boron, sulfur, and lime; and vegetables and berries respond to nitrogen, phosphorus, and potassium.

This unit is poorly suited to the production of Douglas-fir for saw logs. The seasonal high water table retards the growth of Douglas-fir after about 30 years; the resulting timber is more suitable for posts or pulp than for moist other uses.

If this unit is used for homesite development, the main limitations are wetness, moderately slow permeability, low soil strength, and slope. Drainage is needed if roads and building foundations are constructed. Wetness can be reduced by installing drain tile around footings.

This unit is poorly suited to septic tank absorption fields because of wetness as a result of the seasonal high water table, the moderately slow permeability, and slope. Septic tank absorption fields can be installed in some areas where the depth to the seasonal high water table is greater and the unit is less sloping. Absorption lines should be installed on the contour. The limitation of moderately slow permeability can be overcome by increasing the size of the absorption field.

Buildings and roads should be designed to offset the limited ability of the soil in this unit to support a load. Settling can be minimized by compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

Slope limits use of the steeper areas of this unit for building site development. Slope is a concern in installing septic tank absorption fields. Access roads should be designed to provide adequate cut-slope grade, and drains are needed to control surface runoff and keep soil losses to a minimum.

This map unit is in capability subclass III.

37D-Flane gravelly loam, 3 to 25 percent slopes. This deep, well drained soil is on broad bench tops and

LAND USE PLANNING NOTES

Number 3 April 1998

Updated for Clarity April 2010



"STEWARDSHIP IN FORESTRY"

PURPOSE: These technical notes have been developed by the Oregon Department of Forestry (ODF) to help landowners and local governments when they must use an alternative to the USDA Natural Resource Conservation Service (NRCS) Soil Survey or other established data sources to determine the productivity of forestland. Under Oregon Administrative Rules (OAR) 660-006-0005, where sources of data referenced in the rule are not available or are shown to be inaccurate, an alternative method for determining productivity that provides equivalent data may be used. These notes describe the methodologies that the Department of Forestry approves, provides information necessary to use the methodologies and gives direction to counties in evaluating forest productivity reports. Background information is also included to answer commonly-asked questions about forest productivity rating systems. These technical notes and the related tables can be found on the Oregon Department of Forestry's website at:

http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land_Use_Planning.

Please note the Department of Forestry does not measure forest site productivity for landowners. The Department's involvement is focused on establishing a list of approved data sources and methodologies other than those cited in the administrative rule. The Department of Forestry will not issue findings on whether these data sources or alternate methodologies have been employed correctly or if the resulting forest site productivity determinations are accurate. The Department of Forestry is not responsible for verifying field measurements.

Included on page 9 of this guide is a flowchart, which provides a visual aid for counties to step through the process of determining site productivity. Each box in the flowchart is labeled with a number that corresponds to the step and section providing guidance on that topic in these Land Use Planning Notes.

OAR 660-006-0005 (3) Site Productivity Sources are adequate to determine cubic foot/acre/year productivity. 1

Step 1: Using Established Data Sources

Forest landowners who would like to demonstrate its forestland productivity or who question the productivity of their property - whether they wish to have it rezoned for development, want approval for template dwellings, or for another reason - must use established data sources to provide information on soils

The Department of Forestry has concluded that to avoid potential confusion and inconsistent productivity determinations it is important for the department to establish a hierarchy of preferences for the site productivity data listed in OAR 660-006-0005 (2) and (3). In order of preference, the department's hierarchy is as follows:

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- A. Natural Resource Conservation Service soil surveys¹
- B. Oregon Department of Revenue Western Oregon site class maps
- C. USDA Forest Service plant association guides
- D. Other existing data sources determined by the State Forester to be of equal or better quality to Items A, B, and C
- E. Alternate methods to develop site productivity data based on direct tree measurements and calculations using applicable Douglas-fir, western hemlock, or ponderosa pine site tables, with priority given to the species among these three that dominates the area being evaluated
- F. Alternate methods based on direct tree measurements and calculations using other native forest tree species site tables
- G. Site-specific soil surveys.

When NRCS soil survey information is available, it should always be considered first when making forest land site productivity determinations. Where the county determines that NRCS or other established data sources approved by the State Forester are available and accurate for determining site productivity at the scale of the tract of interest, the county planning department must make its decision using these data.

If data from an approved established data source (A, B, or C above) do not exist or is shown through site-specific documentation to be inaccurate for determining site productivity at the scale of the tract of interest, only then should other information determined to be of comparable quality by the State Forester (D above) be consulted. These will normally include published data on forest soils or tree measurements. To date, other published forest soils information that has been determined to be of comparative quality includes, but is not limited to, the following:

- August 1997 *Lane County Soil Ratings for Forestry and Agriculture* produced by the Lane County Council of Governments.
- February 8, 1990, *Forest Lands Soils Ratings – Revisions* produced by the Oregon Department of Forestry for the Oregon Department of Land Conservation and Development (applicable to Benton, Lane, Linn, Marion, Polk, and Yamhill Counties except in Lane County where superseded by the August 1997 Lane County Soils Ratings for Forestry and Agriculture).
- January , 27, 1989 forest soils rating submitted to the Oregon Department of Land Conservation and Development by the Oregon Department of Forestry (applicable to Benton, Clackamas, Clatsop, Columbia, Hood River, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill Counties except where superseded by the February 8, 1990 Forest Lands

¹ Web Soil Survey: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/> -- last accessed April 29, 2010. Also see Published Soil Surveys for Oregon available online at: http://soils.usda.gov/survey/printed_surveys/state.asp?state=Oregon&abbr=OR -- last accessed April 30, 2010.

Soils Ratings and in Lane County where superseded by the August 1997
Lane County Soils Ratings for Forestry and Agriculture)

These documents can be found on the Oregon Department of Forestry's website at:
[http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land Use Planning](http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land_Use_Planning) and may be updated over time as new information becomes available.

Additional information may be assessed and approved by the State Forester on a case by case basis for comparability of quality.

Applicant may use approved ODF methodology for determining Site Index. 2

Step 2: Alternate Methodologies

Where the published site productivity data described above in Step 1 are not available, or when the county determines that it is inaccurate for determining site productivity at the scale of the tract of interest, the alternate methods for determining site productivity described below may be used. [Note: Existence of data listed in Step 1 does not prohibit a landowner from retaining a professional forester or professional soils classifier to measure the productivity of the land if they believe the published data are inaccurate. In such cases, the county must determine which data source it will use in making its decision.]

Alternate methodologies used to measure site productivity must be consistent with the provisions of this Land Use Planning Note and must be considered in the following order:

- a. Alternate methods based on direct tree measurements and calculations using applicable Douglas-fir, western hemlock, or ponderosa pine site tables. The tables may also be used for grand fir, Sitka spruce, and Jeffrey pine, as indicated in Step #4 and Attachment A.
- b. If none of these six species are present, the next step is to consider using site tables for other tree species.
- c. If no adequate trees are present to measure for site productivity, the last available method is to conduct site-specific soil surveys without direct tree measurements.

Where tree measurements are undertaken, a professional forester who is either registered as a full member in good standing with the Association of Consulting Foresters of America or Certified by the Society of American Foresters should be retained by the landowner to take tree measurements and prepare a report.

Consistent and credible site productivity determinations are an important facet of the land use planning process. Attempts to consider a variety of methods simultaneously in hope of arriving at a "preferred" site productivity determination are to be avoided.

The Department of Forestry does not measure sites for landowners. The alternate methodology the Department of Forestry approves to determine the productivity of an area is described in a Weyerhaeuser research paper, by King². Additional information may be found in the *Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNW Range and Experiment Station.* These papers describe how to select site-trees and calculate site index.

Sufficient # of trees on-site to determine Site Index? 3

Step #3: Sufficient Number of Trees On-Site?

Site index is based on measurements of breast-height tree age and total height. A sufficient number of measured trees generally consists of 25 dominant and co-dominant trees all of the same species, if possible. This number is adequate to determine forestland productivity as calculated by site index if soil type, species, and aspect of the ground are consistent throughout the sample area. Additional trees will be needed to represent different soil types, species, and aspect if these exist on the tract in question.

Trees of different species may be selected as long as they use the same site index table (See Step #4). Site index should not vary by more than 20 or 30 points between site trees (as indicated on each site table), unless the difference can be explained by actual site variation.

If the tract has been harvested in the recent past, most or all of the dominant trees in the stand may have been removed. Residual suppressed trees are not acceptable trees for site index measurement. If insufficient dominant trees exist on the tract to determine site index, site trees should be selected for evaluation from adjacent or nearby un-harvested properties with the same aspect, elevation and soil type. In some cases, historical records of past harvests, timber yields, and aerial photos may contribute valuable background information for productivity assessments.

A professional forester (as described in Step #2) should determine whether or not adequate numbers of dominant and co-dominant trees exist on site or in the vicinity to perform the analysis. If the forester issues a written statement that inadequate numbers of qualifying trees exist, the applicant may proceed to Step #6 – a soils analysis.

Method for Selecting Site Trees

1. On the property locate an approximately circular area that encompasses 25 trees (the "site index clump") and that is representative of the site being sampled. Where there is a choice, favor well-stocked areas over sparse areas. Of these

²King, James E. 1966. Site index curves for Douglas-fir in the Pacific Northwest. Weyerhaeuser Forestry Paper No. 8. Weyerhaeuser Forestry Research Center, Centralia, WA.

25 trees, select five that are dominant; co-dominants may be included if five dominants are not available.

2. If a 25-tree clump is not available, a smaller clump may be used. The site tree sub-sample should still be limited to the 20 percent of the trees in the clump that are dominate or co-dominate **unless** this yields fewer than three site trees. Example: For a 15-tree clump, three site trees would be needed - the minimum sample size allowed.
3. If no suitable site trees are available from the property, select dominant trees from the most similar nearby area with the same general aspect, elevation, and soil type. Note the location of the site trees in your report.
4. Site trees should be evenly distributed across the plot area.
5. Any site tree with a clear history of suppression should be rejected, and the next largest tree selected if it is suitable. However, a suppressed tree may be selected over a shorter, suppression-free tree of the same age.
6. Site trees selected should show no signs of top-out, such as crooks or forks, **unless** these trees are taller than normally-formed trees of the same Diameter at Breast Height.
7. Trees should be measured at Breast Height for age.
8. Trees under 50 years old are undesirable if older trees are available. For ponderosa pine, trees 60 to 120 years old are most desirable.

Definitions:

Age – The age of the tree at Breast Height determined by boring a tree revealing a core piece with notable rings that are counted. Each ring represents a year of age.

Breast Height – A height 4.5 feet from the ground on the uphill side of the tree.

Co-dominant -- Trees with crowns forming the general level of crown cover of the stand.

DBH – The diameter at breast height or 4.5 feet from the ground on the uphill side of the tree.

Dominant – Trees with crowns extending above the general level of the stand. These are the larger than average trees on the property.

Increment Core – This is a core piece of the tree that is removed where rings can be counted to determine age.

Suppressed -- A tree that has been suppressed will have closely-spaced annual growth rings on all or part of its increment core.

Step #4: Approved Site Index Tables

There are three approved site index tables for Douglas-fir, western hemlock, and ponderosa pine. (Tables A, B, and C in Attachment A). These tables may also be used for grand fir, Sitka spruce, and Jeffrey pine, respectively.

How to use site tables:

The attached site index tables are "upper limit tables." This means that when a tree height indicates a site index that falls between two site indices, the higher one should be used. Example: A site tree is Douglas-fir, breast height age is 75 years old and total height is 115 feet tall. King's 50-year Douglas-fir site index table indicates that a tree with a total height of 115 feet and breast height age of 75 falls between site index 90 and 95; site index is therefore 95.

- A. King's 50-year Douglas-fir table³. Use for Douglas-fir and grand fir.
- B. Barnes' 100-year western hemlock table⁴. Use for western hemlock and Sitka spruce.
- C. Meyer's 100-year ponderosa pine table⁵. Use for ponderosa pine and Jeffrey pine. Use this table for stands that are predominantly ponderosa pine, or when pine site trees are all that are available, except in the Willamette Valley⁶. A credible site index or yield table for ponderosa pine applicable in the Willamette Valley has not been found to exist at this point in time. Until a credible Willamette Valley ponderosa pine site table becomes available and is acknowledged in a revised Department of Forestry Land Use Planning Note, the Department of Forestry's position is that it is inappropriate to use ponderosa pine to determine site productivity under OAR 660-006-0005(2) and (3). Thus, the applicant's remaining option for pine stands in the Willamette Valley would be to conduct a soils analysis following OAR 603-080-0040 (3).

The average height and the average age of the site trees can be used with the tables in Attachment A to determine site index. Tracts [as defined in OAR 660-006-0005 (3)] large enough to contain changes in productivity (e.g., multiple soil types or changes in

³ King, James E. 1966. Site index curves for Douglas-fir in the Pacific Northwest. For. Pap. 8. Centralia, WA: Weyerhaeuser Company, Forestry Research Center. 49 p.

⁴ Barnes, George H. 1962. Yield of even-aged stands of western hemlock. USDA, Forest Service. Pacific Northwest Forest and Range Experiment Station Technical Bulletin 1273.

⁵ Meyer, Walter H. 1961. Yield of even-aged stands of ponderosa pine. USDA Technical Bulletin 630. (revised 1961).

⁶ Willamette Valley is defined as: Clackamas, Linn, Marion, Multnomah, Polk, Washington and Yamhill Counties and that portion of Benton and Lane Counties lying east of the summit of the Coast Range.

aspect) will require mapping the different areas of productivity, making separate calculations for the productivity of each area, and weighted averaging of the productivity across the tract.

Nonstockable Areas:

Nonstockable areas can be caused by the presence of standing or running water, a high water table, saturated soils, rock or shallow soil over rock, severe soil compaction, or mass soil movement. Nonstockable areas should be mapped and deducted from the total productivity of the tract on a percentage of area basis. Appropriate and adequate site-specific documentation is needed to justify these deductions, which in some cases may require the expertise of a professional forester or a professional soils classifier.

Determining Cubic Foot Productivity:

The tables in Attachment B are derived from a US Department of Agriculture⁷ publication. They use species-specific site index information as determined from on-site measurements and the site index tables to reference a set of cubic foot productivity tables. To use a species table, find the calculated site index of the property in the left-hand column and obtain the cubic foot per acre per year from the column on the right with the corresponding reference to the site table used.

Documentation:

The consultant should document site index table(s) used, tree selection, and productivity assessment. Site index values are to be correlated with cubic foot per acre per year productivity ratings. A sample data form for forestland site productivity determination using site index is provided at the end of this Technical Note.

ODF may approve other methods or Site Index Tables for other species. 5

Step #5: Other Methods for Other Species

The Department of Forestry may approve other tree measurement methods or site index tables to determine productivity for other tree species. The methods listed in this paper can be used in combination with other published site index and yield tables if the site is not suited to one of the species listed in this paper. However, the use of other tables or the use of other species to determine site index must be approved in writing by the Department of Forestry on a case-by-case basis.

To request approval of other methods not listed in Step #4, contact the Forest Policy Analyst in the Forest Resources Planning Program for the Department of Forestry at 503-945-7411. The Department of Forestry will notify the county in writing of its

⁷USDA. 1986. Culmination of mean annual increment for commercial forest trees of Oregon. Technical Note No. 2. USDA, Soil Conservation Service, Portland, OR. (Note: the SCS - Soil Conservation Service is now the NRCS - Natural Resource Conservation Service)

recommendation that the method be used or not used. If the method is approved for use, a professional forester (as described in Step #2) should document the method used, tree selection and productivity assessment. If the method is not approved for use, or an acceptable alternative proposed, a soils analysis as described in Step #6 below is the remaining option.

Soil Survey is last option; follow OAR 603-080-0040 (3). 6

Step #6: Last Option: Soil Analysis

Where there are an insufficient number of trees on-site or nearby to conduct tree measurements, or where an alternate method for an unlisted tree species has not been approved, a site-specific soil analysis is the last option for determining site productivity. In this case, a professional soils classifier certified by the Soil Science Society of America should be used and the soils reporting provisions of OAR 603-080-0040 must be followed.⁸ The Department of Forestry does not have the expertise to evaluate site-specific soil survey information.

County makes decision based on documentation provided and follows all other regulations. 7

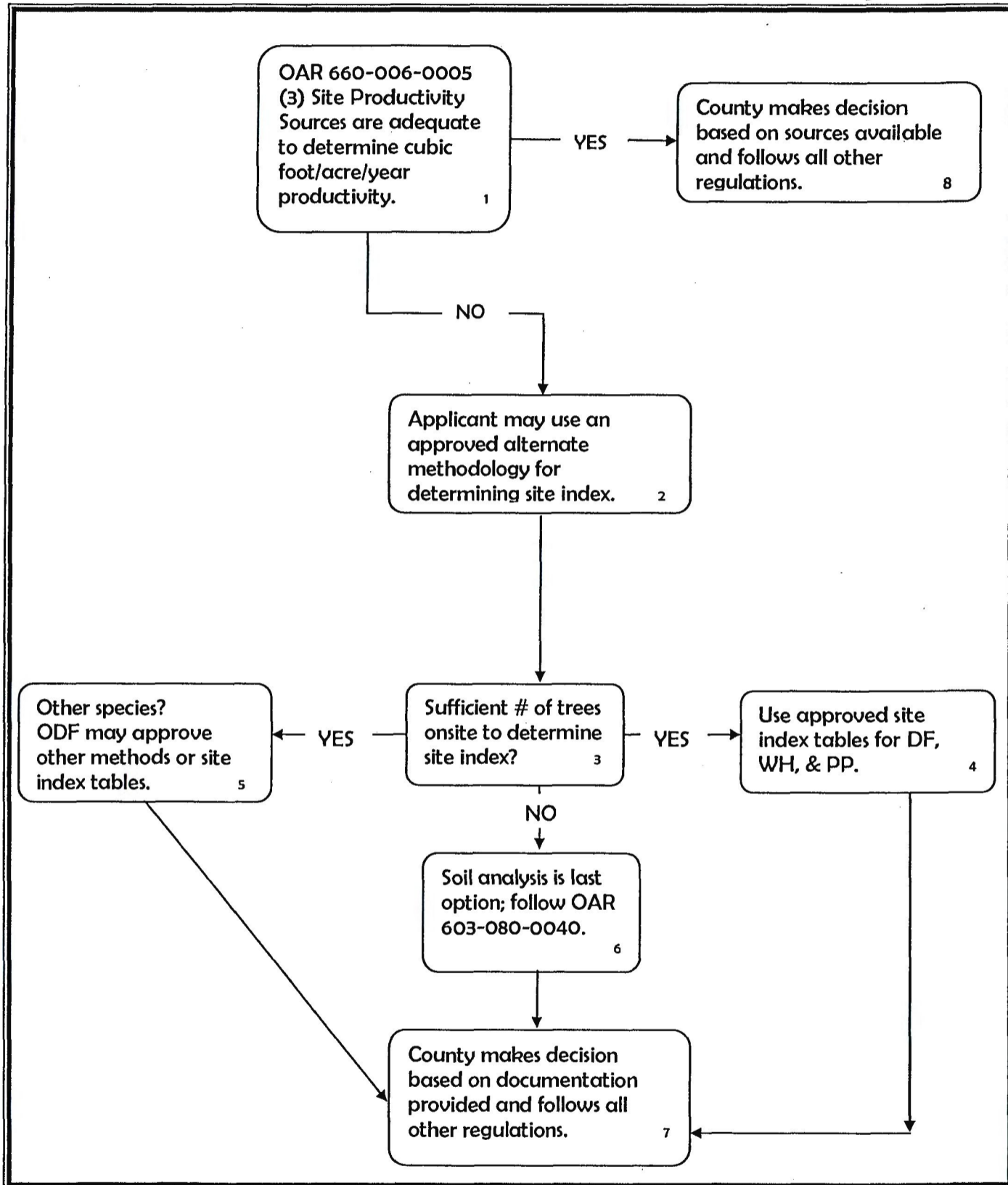
Step #7: County Review of Professional Reports

Professional assessments of forestland productivity must be submitted to the county planning department in report form for its review. Soils reports shall meet the standards for submittal that are set forth in OAR 603 Division 80. The burden of proof is on the applicant and the consultant to demonstrate that information in the submitted report is more accurate than that available in established data sources. The county staff may request the assistance of the State Forester in evaluating whether approved methodologies were used in a consulting forester's report.

The following flowchart will enable planners to determine whether the appropriate forestland productivity data has been gathered.

⁸ If a determination is also being regarding whether the tract in question qualifies as agricultural land, the provisions of 2010 House Bill 3647 apply.

A Flow Chart for Determining Forestland Site Productivity



APPENDIX

Background and Additional Information:

Table 1. CUBIC FOOT PRODUCTIVITY CLASSES

<u>CLASS</u>	<u>POTENTIAL YIELD-MEAN ANNUAL INCREMENT</u>
1	225 or more cu.ft./ac./yr.
2	165 to 224 cu.ft./ac./yr.
3	120 to 164 cu.ft./ac./yr.
4	85 to 119 cu.ft./ac./yr.
5	50 to 84 cu.ft./ac./yr.
6	20 to 49 cu.ft./ac./yr.

The Department of Forestry advises using the USDA Cubic Foot Productivity Class⁹ system, as opposed to other systems of measure, when making land use planning decisions because it measures the relative productivity of the soil, is not dependent upon the condition of the forest or the species of trees currently growing on the site, and is more consistent than other measures. The cubic foot productivity class system reveals the average growth rate of timber over the life of the stand measured at the peak of that average growth rate. Table 1 above shows the potential timber yields of productivity classes 1 - 6 in cubic feet per acre per year (cu.ft./ac./yr.).

Other measures that might be used to compare productivity, such as site class or site index, are not consistent between species. Site class is commonly used on the west side to describe the productivity of Douglas-fir forests, but not other species. Site index measures productivity as a function of age and is calculated as tree height divided by tree age at a base age of 100 or 50. Since on the same area, in the same length of time, different species grow to different heights, site index is not consistent between species. For example, two species with the same site index will yield different cubic foot ratings, as seen in Table 2 below.

Table 2. RATING SYSTEM COMPARISONS¹⁰

All Species

Site Index Table

Site indices

Cubic foot comparisons

Douglas-fir (50 yr King Site Index)	100	136
Douglas-fir (100 yr McArdle Site Index)	100	84
Western Hemlock (100 yr Barnes Site Index)	100	142
Ponderosa Pine (100 yr Meyer Site Index)	100	102
White Fir (100 yr Schumacher Site Index)	100	218
Engelmann Spruce (100 yr Alexander Site Index)	100	109

⁹ Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNW Range and Experiment Station.

¹⁰ Based on: USDA Soil Conservation Service. 1986. Culmination of Mean Annual Increment for Commercial Forest Trees of Oregon. Technical Note No.2 Forestry Revised June 1986. Portland Oregon.

Another advantage of using cubic foot productivity class is that the ratings are available for most forestland without professional assistance. The published soil surveys contain ratings that can be used by county planners or private landowners to evaluate productivity and using the information does not require visiting the site or taking measurements.

Cubic foot site productivity determinations assume fully stocked stands. In this context, "stockable area" means the proportion of an area that can be physically stocked with trees. Rock outcrops, impervious soils, or high water tables are examples of factors that may result in less than 100 percent of the site being stockable.¹¹ Upon request by a county government, the Department of Forestry will evaluate factors used in calculating reductions in site productivity from fully stocked stand levels.

¹¹ For more information, consult the USDA Forest Service, Pacific Northwest Research Station *Field instructions for forest surveys in Washington, Oregon, and Northern California* where consideration of stockable area factors are addressed.

Sample Data Form for Forestland Site Productivity Determination using Site Index

Date Prepared: _____ County: _____

Landowner Name: _____

Land use case file number (if available): _____

Location

Township: _____ Range: _____ Section(s): _____ Lot Number: _____

Name of Forester preparing report: _____

Forester's background (work experience, education, training, certifications, etc.):

Methods and equipment used in data collection:

Soil Type(s) and percentages on tract in question: _____

Tree species on tract in question: _____

Number of Dominate or Co-Dominate Trees/Species Sampled: (ex. 5 Douglas-fir, 10 Western Hemlock)

Average Height: _____

Average Age: _____

Average Site Index: _____ Site Productivity cubic feet/ac./yr: _____
(Use appropriate approved Site Index table in Attachment A) (Use Attachment B)

Notes/Comments:

- Attach map of property with marked locations of where the trees sampled are located. Map needs to be at appropriate scale for ease of viewing property and understanding where the trees are located.
- Attach site index tables used.
- Attach other documentation and evidence needed to justify methods and conclusions.

Oregon Department of Forestry
Land Use Planning Notes Number 3 – April 2010

Exhibit 11
Page 12 of 13

Data Collection Form: * Make copies if more than 30 trees sampled.

Tree ID	Tree Species	Height (ft.)	Age (yrs.)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

Sum: _____

Average: _____



Marc E. Setchko
CONSULTING FORESTER

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FAX: (541) 344-7791

FOREST PRODUCTIVITY ANALYSIS
for
Carol Cromwell

SUBJECT PARCEL: CROMWELL PARCEL: ASSESSORS MAP NO. 12-01-07
Tax Lot 903, totaling ±15.25 acres

QUALIFICATIONS: Society of American Foresters Certified Professional Forester (#2953), with 32 years of experience including 22 years as a consultant, with Bachelor of Science (Cal Poly, SLO) and Master of Forestry (Oregon State) Degrees. As a consultant I have extensive experience in all phases of forestry, including preparation of forest management plans, handling the administration of these plans and maximizing the return to my clients. My productivity analyses are based on sound and "reasonable" forest management practices, with the ultimate goal of establishing fully stocked stands of conifer.

I have 33 years of experience cruising timber and hundreds of cutouts for companies like Weyco, Giustina, Roseburg, Rosboro, Seneca, Douglas County Forest Products, and others. Cutouts are a comparison of cruised volume to volume actually cutout. I have a very consistent record with these companies, as well as banks, private clients, etc.

I. SUMMARY

An evaluation of the site, from a timber productivity standpoint, is presented in this analysis, to determine whether the site in question is "forest land" that is suitable for commercial forestry under Statewide Planning Goal 4. The analysis demonstrates that the subject property is not commercial forestland from a productivity standpoint.

For Dixonville-Philomath-Hazelair complex (35C and 35E) mapped on this site, the NRCS listed site index of 120 cf/ac/yr reflects the potential production of the Dixonville component which accounts for only 30 percent of the complex. Referring instead to *Forest Lands Soils Ratings*, ODOF estimates a productivity rating of 45 cf/ac/yr for Dixonville-Philomath-Hazelair complex in Linn County. Direct tree measurements determined the actual productivity of the site to be in the range of 29.75 cuft/ac/yr to 32.72 cuft/ac/yr.

Reference is made to Land Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010, by Oregon Department of Forestry which provided the guidance for this work.

II. SITE INFORMATION

The subject parcel is located in Section 7, T12S, R1W, WM, Tax Lot # 903. It is 15.25 acres in size (see Exhibits 1 and 2). Terrain throughout the site is gentle to moderate, with slopes ranging from flat to 35%. The west one-third of the parcel has a west to southwestern exposure, with the southeast portion of the parcel being almost flat and the northeast portion, with 5-10% slopes, facing slightly to the north. The Dixonville-Philomath-Hazelair soil complex (35C & 35E) covers the entire parcel (see Exhibits 3 and 4). White oak and Douglas-fir are the predominant trees on the parcel, with a few ponderosa pine and maple scattered about. Portions of the parcel have nothing but small scrub oak growing. Blackberry and poison oak are the predominant brush species. Several open areas with grass cover are also present; there is no evidence of any tree growth (hardwoods or conifer) in these openings. There is almost no evidence of any logging activities within the stands, other than the removal of a few blowdowns.

Exhibit 12
Page 1 of 33



Cruising & Inventory
Timber Appraisals, Marketing & Sales

Forestland Management
Forestland Productivity & Zoning Work



This soil is poorly suited to the production of Douglas-fir. Trees will grow well until they are about 35 years old, at which time the root system becomes restricted by the clay and high water table and the trees become highly susceptible to root rot and windthrow. Soil depth is thin throughout much of the parcel, with exposed rock evident in many places. The trees growing are short, especially for their age (≈60 years). This is an indicator that the soils are shallow and/or poorly drained.

III. PRODUCTIVITY – Cubic feet per acre per year growth.

Established data sources must be used to provide information on soils (see Exhibit 5). The Oregon Department of Forestry has concluded that to avoid potential confusion and inconsistent productivity determinations it is important for the department to establish a hierarchy of preferences for the site productivity data listed in OAR 660-006-0005 (2) and (3). In order of preference, the department's hierarchy is as follows:

- A. Natural Resource Conservation Service soil surveys
- B. Oregon Department of Revenue Western Oregon site class maps
- C. USDA Forest Service plant association guides

If data from an approved established data source (A, B, or C above) do not exist, the following published forest soils information has been determined to be of comparative quality. These sources are:

1) August 1997 *Lane County Soil Ratings for Forestry and Agriculture* produced by the Lane County Council of Governments,

2) February 8, 1990, *Forest Lands Soils Ratings – Revisions* produced by the Oregon Department of Forestry for the Oregon Department of Land Conservation and Development (applicable to Benton, Lane, Linn, Marion, Polk and Yamhill Counties except in Lane County where superseded by the August 1997 Lane County Soils Ratings for Forestry and Agriculture.)

3) January 27, 1989 forest soils rating submitted to the Oregon Department of Land Conservation and Development by the Oregon Department of Forestry (applicable to Benton, Clackamas, Clatsop, Columbia, Hood River, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill Counties except where superseded by the February 8, 1990 Forest Lands Soils Ratings and the August 1997 Lane County Soils Ratings for Forestry and Agriculture.)

A new source has also been approved since the 1998 Planning Notes were updated for Clarity in April 2010. Lane County has issued an August 2011 Update of the 1997 source mentioned above.

No further review or approval of site productivity determinations are needed when these data sources are used.

IV. PRODUCTIVITY CALCULATIONS

An average per acre productivity figure for the entire parcel can be calculated by summing up the cubic foot per acre per year productivity (growth of the timber stand) of each soil type, then dividing this total by the total acreage.

Douglas-fir was used because it is the dominant conifer species on the property and will grow in pure stands. All of the productivity figures shown on the sources listed above assume a fully stocked stand of the tree species being measured. Grand fir could possibly grow on this site; however, none exists on the parcel. Grand fir does not grow in pure stands; it is a minor species which grows intermixed with Douglas-fir. The only other species suited to this site are incense cedar and ponderosa pine. There are a few Ponderosa pine on the parcel, no incense cedar were found. Incense cedar does not grow as fast as Douglas-fir, therefore it was not considered. Ponderosa pine, which will grow in pure stands, was not considered because there are no credible growth tables for Willamette Valley Pine (see Exhibit 6, page 3). In western Oregon locations, such as the parcel in question, Douglas-fir is the dominant conifer species on the site. White oak, with a little madrone, is growing throughout the parcel; both are slow growing in comparison to Douglas-fir. Alder and western hemlock, both fast growing trees, will not grow on the site due to moisture (rainfall) constraints.

Therefore, Douglas-fir shall be used for productivity calculations.

Douglas-fir cubic foot productivity numbers are available for all of the above listed soils. The numbers shown below were obtained from the aforementioned tables (see Exhibit 7).

PRODUCTIVITY CALCULATIONS

Soil Type	Acres	cf/ac /yr	Total cf/yr
35C Dixonville-Philomath-Hazelair complex, 3-12% slopes	7.01	est.45	315.45
35E Dixonville-Philomath-Hazelair complex, 13-35% slopes	<u>8.24</u>	est.45	<u>370.80</u>
	15.25		686.25

Productivity = 686.25 cubic feet/ac/yr ÷ 15.25 acres = est. 45 cubic feet/ac/yr

The above productivity numbers assume a full stocked, *unmanaged* stand of Douglas-fir covering every acre of the parcel. All productivity numbers are also an average for a particular soil type. These numbers do not take into account different aspects, elevations, moisture availability or soil depth. The exact same soil on a southern aspect will have a lower cubic foot productivity than a northern aspect. The amount of rainfall, i.e., available moisture, will vary considerably in any given area. Higher elevations have shorter growing seasons. A very shallow soil depth will inhibit growth, particularly in the later stages (age) of growth. For all of these reasons the cubic foot per acre growth of trees will vary greater from site to site.

V. ALTERNATIVE PRODUCTIVITY CALCULATIONS

For all of the above reasons the parcel in question does not have fully stocked stands covering the entire property. There are several grassy openings; there are no stumps, or any other evidence of trees ever growing, in these areas. The soil is very thin in these openings, with only grass and patches of blackberry growing, with exposed rock evident in many places. Large portions of the timbered areas on the parcel are covered with nothing but small scrub oak. Other portions of the timbered areas have widely spaced, short trees. This is further evidence of poor growing conditions and/or conditions not conducive to growing fully stocked stands. The Oregon Department of Forestry has recognized that these conditions create nonstockable areas, which will not grow trees or prevent and/or inhibit the growth of fully stocked timber stands (see Exhibit 6, page 4).

Therefore, a site specific approach was also used to calculate the cubic foot per acre per year productivity of the site. The timber was cruised to obtain a total volume of commercial timber on the parcel (see Exhibit 8), expressed in thousand board feet (MBF). The cubic foot volume can then be calculated using the C/SCR ratio from the Douglas-fir Empirical Yield Table. This is the ratio between cubic volume and Scribner Scale Volume. The Scribner Scale Volume is the number shown above (100.7 MBF), which was obtained from the timber cruise of the property.

To obtain a ratio off of the tables, a site index is needed. Ten site trees bored show a site index of 84. This is mid Site IV ground (see Exhibit 9). There are five site classes in Western Oregon (six in Eastern Oregon). Site class V will barely support tree growth, let alone grow fully stocked stands. The trees bored are an average of 60 years old, therefore a number can be obtained from the aforementioned table. Since the tables are not linear, it is difficult to interpolate; therefore a range was calculated. Using the C/SCR Ratio for sixty years on a site index of 80 shows a ratio of .297; Site Index 90 shows a ratio of .270 (see Exhibit 10). These ratios can then be applied to the cruised volume of 100.7 MBF. By applying these ratios, the average cubic foot per acre productivity, for the entire parcel can be calculated.

The calculations are based on 14 timbered acres and 1.25 nonstocked/unstockable acres.

1) Volume per acre - $100.7 \text{ MBF} \div 14 \text{ timbered acres} = 7.2 \text{ MBF/ac}$

2) Site Index 80 = $.297 \text{ (ratio)} \times 7.2 \text{ MBF/ac} = 2,138.4 \text{ cuft/ac}$

3) Site Index 90 = $.270 \text{ (ratio)} \times 7.2 \text{ MBF/ac} = 1,944.0 \text{ cuft/ac}$

Productivity of Entire Parcel

Site Index 80:	14.00 acres @ 2,138.4 cf/ac =	29,937.6 cu.ft.
	<u>1.25 acres @</u> 0.0 cf/ac =	<u>0.0 cu.ft.</u>
	15.25 acres	29,937.6 cu.ft

$29,937.6 \text{ cu.ft.} \div 15.25 \text{ acres} = 1,963.1 \text{ cu.ft./ac.} \div 60 \text{ yrs. (average age of trees)} = 32.72 \text{ cf/ac/yr}$

Site Index 90:	14.00 acres @ 1,944.0 cf/ac =	27,216.0 cu.ft.
	<u>1.25 acres @</u> 0.0 cf/ac =	<u>0.0 cu.ft.</u>
	15.25 acres	27,216.0 cu.ft

$27,216.0 \text{ cu.ft.} \div 15.25 \text{ acres} = 1,784.7 \text{ cu.ft./ac.} \div 60 \text{ yrs. (average age of trees)} = 29.75 \text{ cf/ac/yr}$

These calculations show a productivity of 29.75 cuft/ac/yr to 32.72 cuft/ac/yr.

I have used sixty years because that is the average age of the timber currently on the parcel. The ratio used is different for each calculation because the ratio of cubic foot volume to Scribner volume changes over time. The younger the timber is, the higher the ratio will be; the older the timber is, the lower the ratio will be. The faster the tree grows, i.e., the higher the Site Class of the parcel, the faster this ratio will drop. This is because small trees have little (if any) measureable Scribner volume, but will have cubic volume. As the trees get larger they will begin to have measureable Scribner volume, as well as cubic volume. The percentage of the tree, which can be measured in Scribner volume, increases over time as the tree grows. The tree will also have measureable cubic volume, but the ratio between cubic and Scribner will shrink as the tree continues to grow (see Exhibit 11). This does not mean that the cubic volume is decreasing, it is simply a reflection of how much more of the tree can be measured in Scribner volume. For the timber to be considered commercial it must be large enough to measure in Scribner volume.

Another aspect of this discussion is the age at which the tree's growth rate should be measured. Tree growth changes over time. Tree growth begins slowly, as the tree roots establish themselves. Once the roots are established, the growth rate increases dramatically. The growth rate continues to increase until it peaks and begins to slow down. This is the PAI (periodic annual increment). The growth continues to slow down until there is almost no discernible growth; eventually the tree begins dying, at this point in time the "growth" is negative. At this age the trees would be considered "old growth". Over time the growth can be averaged. This number is the MAI (mean annual increment). CMAI (culmination of annual increment) is the point at which the PAI and MAI intersect (see Exhibit 12). This is the point at which the tree's annual growth rate is slower than the average growth rate over time. At this point in time the timber is considered "mature"; it has passed its peak of wood growth production in the biological sense and the MAI begins to decrease as well. The age of "Old Growth" trees is far beyond the CMAI of their growth.

However, from a **commercial forest operation** standpoint, it is usually well past the desired harvest age, i.e., from a cost-benefit point of view, the best age to harvest the trees is just past the peak of the PAI. This is because once the tree growth starts slowing down, the rate of return on investment begins decreasing. In most cases, commercial forest operations use this as the primary harvest strategy because **it is the most profitable**. Exceptions to this are timber grown to an older age to obtain specific wood characteristics; i.e., larger wood and/or ring count. An older tree will be larger (self explanatory) and slower growing (because it is past the peak growth rate). Larger boards, beams, etc. can be cut from larger timber; slower growing trees produce more rings per inch (finer grain, stronger wood). These trees will sell at a higher price; therefore, from a cost-benefit approach it pays.

The majority of timber, west of the Cascades, is harvested between 35-50 years of age. This is the age at which the PAI of the trees starts slowing down on Site Class I-III; from a cost-benefit point of view, for a commercial forest operation, it is the best point in time to harvest. Trees growing on Site IV ground (**site class of the parcel being considered**) take longer to reach a commercial size; in most cases these trees are harvested at 60 years of age (the age of the trees of the parcel being looked at). To summarize from a commercial forest operation perspective: trees have to grow long enough to reach a commercial size, but harvested before their growth rate significantly declines.

A final note: All of the cubic foot productivity tables listed above (from the Land Use Notes Publication) are based on productivity at 50 years of age. The Site Class tables for Douglas-fir are based on 50 years of growth as well. This is a reflection of current commercial forest practices in the western portion of Oregon.

VI. DISCUSSION OF ANALYSIS

The preceding analysis was conducted to determine if the parcel in question is "suitable for commercial forest use". **Linn County does not have set parameters** for determining the level of productivity at which a parcel is unsuitable for commercial forest use. As a professional forester for 35 years I prefer to manage properties with a productivity of 120 cf/ac/yr. or above. This is the lowest productivity level of Site Class III ground. Site Class IV has a productivity of 85-119 cf/ac/yr.; this is very tough ground to manage on a commercial level. Site Class V has a productivity level of 50-85 cf/ac/yr. This site class has an extremely slow growth rate and is not viable from a commercial standpoint, i.e., if considered from a cost-benefit viewpoint. This is the lowest Douglas-fir site class in western Oregon. As a forester I was taught that 50 cf/ac/yr was the lowest threshold for commercial growth in western Oregon and 20 cf/ac/yr was the lowest threshold for commercial growth in eastern Oregon.

These productivity levels (for west and east) are discussed in LUBA case No. 2009-068, Just vs. Linn County, in the context that the legislature may view these productivity levels as indicative of land suitable for commercial forest use. The key issue here is not whether or not trees will grow, but if the growth rates support commercial forest use. The characteristics of timberland, in terms of productive capacity, vary tremendously between different regions in Oregon. A preponderance of evidence points to 70 cu ft/ac as the accurate cut off for forestland designation in the Willamette Valley area.

Even if productivity equal to, or greater than, 50 cf/ac/yr is deemed commercial forestland, at these low rates of growth, the financial viability is questionable at best. As a forester I have been trained to manage timber growth in a manner which provides good returns, or at least positive, returns to my clients.

The above cubic foot productivity numbers fit Lane County's parameters for productivity, with less than 85 cf/ac/yr of growth being considered "marginal" land and less than 50 cf/ac/yr of growth being considered "nonresource" land. While these numbers have not been adopted by Linn County, they are very realistic from a commercial forestry standpoint in Western Oregon. They also match the Site Index Productivity figures for Douglas-fir Site Index Classes (see Exhibit 13). As mentioned above, anything below 120 cf/ac/yr (Site Classes IV-V) is a challenge from a "commercially viable" management standpoint. To put these growth rates in perspective: the top Douglas-fir sites produce 260 cf/ac/yr of new growth. From this perspective it can be seen that less than 50 cf/ac/yr is extremely poor production from a growth standpoint. From a cost-benefit standpoint it cannot be considered commercially viable. From a forester's viewpoint it is hard to consider a timber stand "commercial forestland" if it does not provide a monetary return to the owner. **Any attempts to produce commercial stands on the property would be futile.**

IV. CONCLUSION

Linn County does not have a "bright-line" parameter for determining the dividing line between what is "non-resource" and "resource". Just because a parcel has trees growing, does not mean it is suitable for commercial forest use. Commercial use would also mean the operation was capable of producing a profit on a sustainable basis, rather than losing money simply to grow trees.

The exceptionally low productivity of the site alone makes it unsuitable for use as commercial forestland. Other limitations exist as well. Shallow soils, high rock content and poor drainage due to high clay content are not conducive to conifer growth. These conditions also create problems for reforestation of the property. These existing conditions would also be exacerbated by compaction of the thin soils by ground logging, which would further reduce the summertime moisture-holding capabilities needed for a one-time reforestation.

In summary, the soil conditions and physical limitations of the site make it unsuitable for commercial forest operations in a sustainable manner over time.

Sincerely,

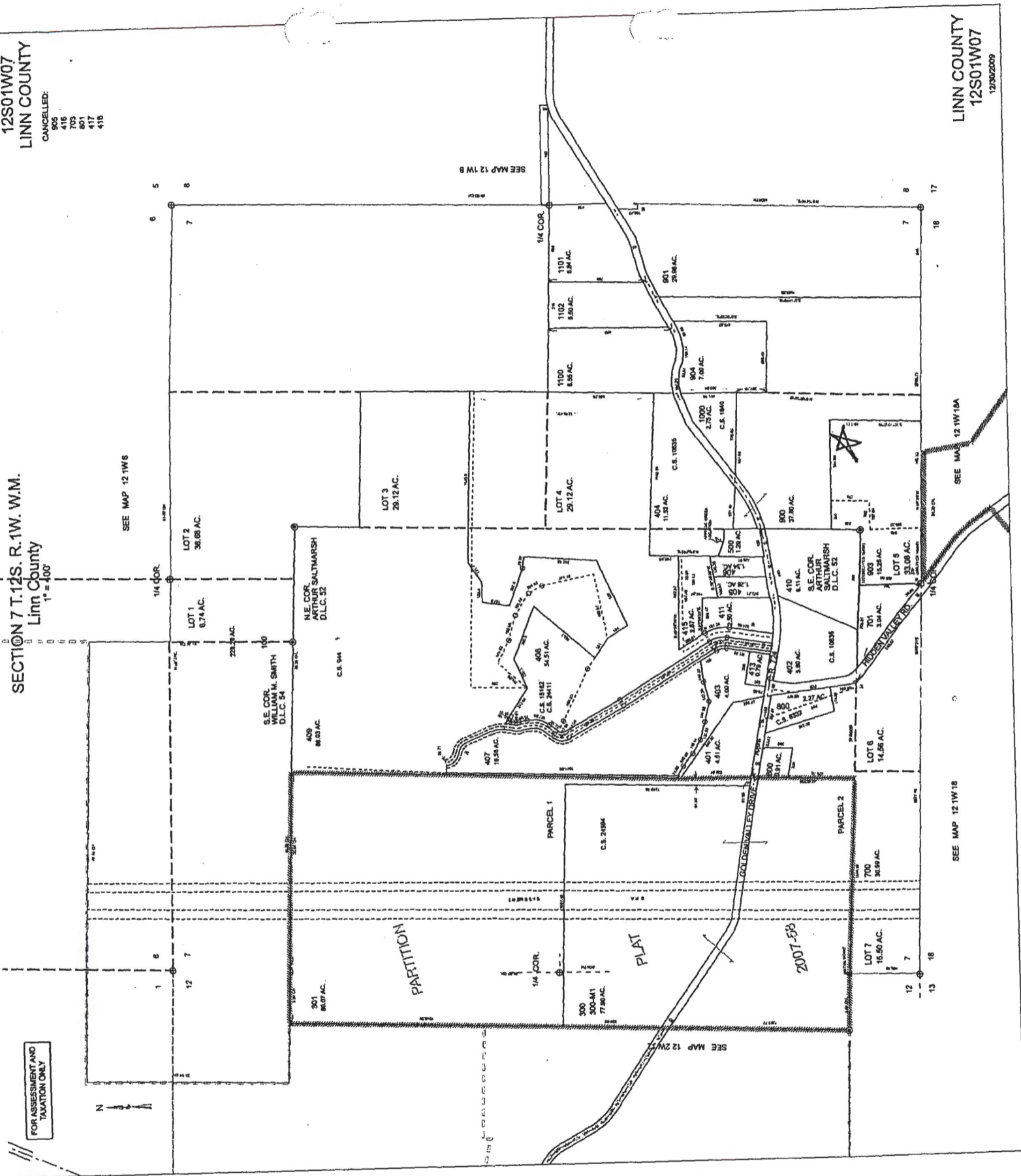


Marc E. Setchko
Certified Professional Forester (#2953)

12S01W07
 LINN COUNTY
 CANCELLED:
 905
 416
 035
 607
 417
 418

SECTION 7 T.12S. R.1W. W.M.
 Linn County
 1" = 400'

LINN COUNTY
 12S01W07
 12/03/2009



FOR ASSESSMENT AND
 TAXATION ONLY

EXHIBIT 1

Exhibit 12
 Page 7 of 33

EXHIBIT 2
CROMWELL PROPERTY
HIDDEN VALLEY ROAD
T12S-R1W-Section 7
±15.25 acres
1" ≈ 610'



T12S-R02W12

T12S-R01W07

T12S-R01W08

Exhibit 12
Page 6 of 33

T12S-R02W13

T12S-R01W18

T12S-R01W17

EXHIBIT 3

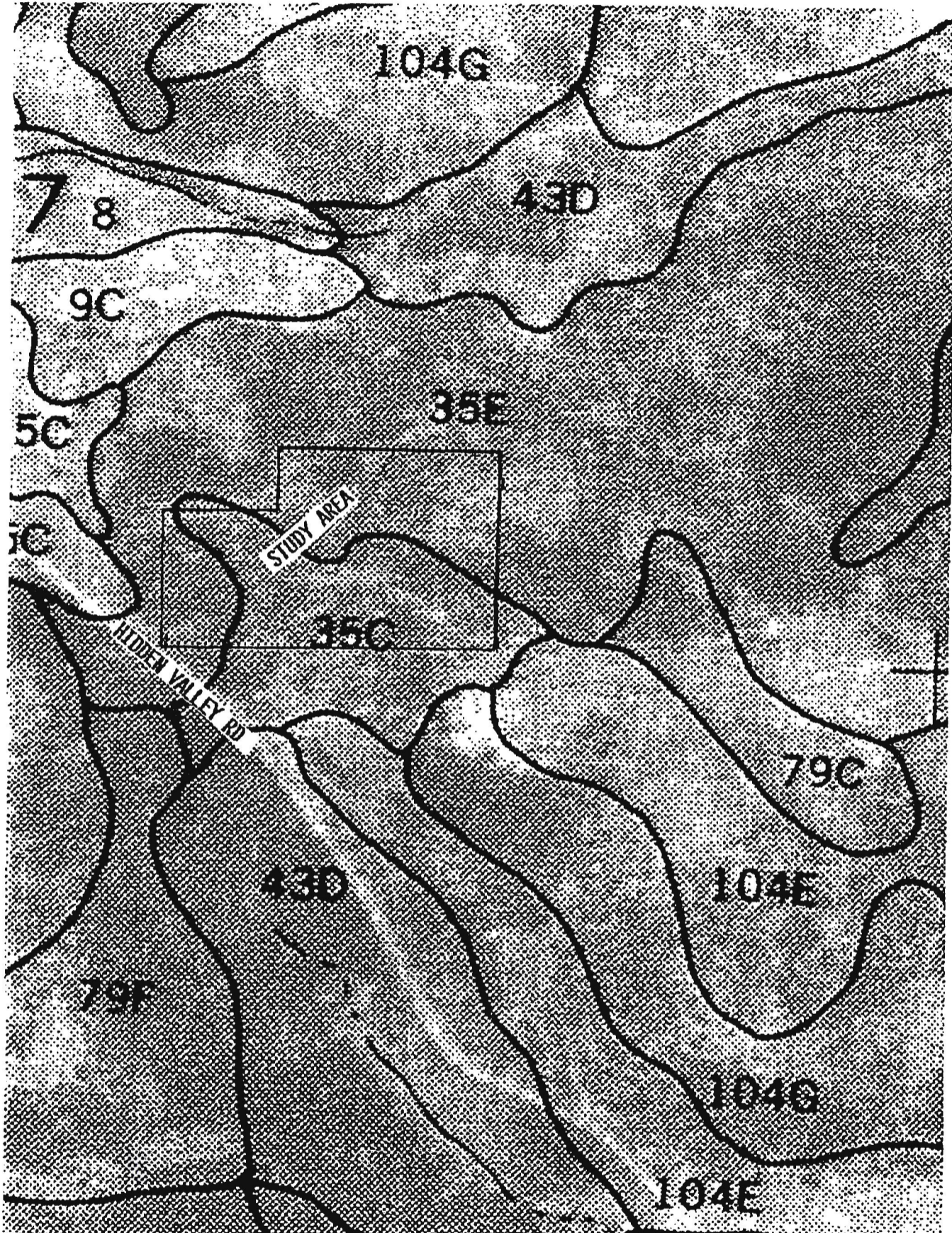


Fig. 1. Enlarged portion of sheet 44 from the Soil Survey of Linn County Area, Oregon, showing the original soil map of the study area.
Scale: 1 inch = 412 feet

This is a scanned version of the text of the 1987 National Soil Survey report of Linn County, Oregon, issued in 1987. Original tables and maps were deleted. There may be references in the text that refer to a table that is not in this document.

Updated tables were generated from the NRCS National Soil Information System (NASIS). The soil map data has been digitized and may include some updated information. These are available from <http://soildatamart.nrcs.usda.gov>.

Please contact the State Soil Scientist, Natural Resources Conservation Service (formerly Soil Conservation Service) for additional information.

Soil Survey of Linn County Area, Oregon

By Russell W. Langridge, Soil Conservation Service

Fieldwork by Russell W. Langridge, Matthew H. Fillmore,
William R. Patching, Philip R. Smith, and
Stanley C. Winther, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
In cooperation with
United States Department of the Interior, Bureau of Land Management,
and Oregon Agricultural Experiment Station

LINN COUNTY AREA is in the west-central part of Oregon. Albany, the county seat, has a population of 26,900. The survey area includes 956,560 acres, or about 1,495 square miles, of private land and 143,483 acres, or about 379 square miles, of federally administered land. Of this acreage, about 133,918 acres is managed by the Bureau of Land Management and 9,565 by the Forest Service.

The survey area is principally that part of Linn County that is not included in the Willamette National Forest. Included in the area are those parts of the Willamette Valley and the valleys of the North Santiam, South Santiam, and Calapooya Rivers that are used for intensive farming and community development. Rolling foothills in the area rise abruptly from valley terraces and extend in a general north-south direction, paralleling the east side of the Willamette Valley. These areas are used for limited cultivated farming, hay and pasture, and community development. East of the rolling foothills, the survey area is steep and mountainous and consists of forest land. Elevation ranges from 185 feet near the Willamette River to 4,966 feet at Galena Mountain, in the Cascade Range. The survey area is mainly in the Willamette Valley and Western Slope Cascade Mountains major land resource areas (27).

An older survey, "Soil Survey of Linn County, Oregon," was published in 1924 (28). This earlier survey covers a part of the present survey. The present survey,

however, updates the earlier survey and provides additional information and larger maps that show the soils in greater detail.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

General Nature of the Survey Area

This section briefly discusses the natural resources; physiography, relief, and drainage; farming; woodland; and climate of the survey area.

Natural Resources

The natural resources in the survey area are related to water, minerals, soil, and timber. Clear mountain streams and rivers provide habitat for several species of fish and provide water for domestic use and hydroelectric power. The natural and manmade lakes, as well as numerous rivers and streams, provide many opportunities for recreation. Dense stands of Douglas-fir and western hemlock grow in the mountainous areas of the Cascade Range. Gold has been mined in the mountains due north.

EXHIBIT 4

Exhibit 12
Page 10 of 33

vegetation and is a potential source of sedimentation. Hauling away waste material minimizes damage to the soil and to the plant cover downslope of roadbuilding sites.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy periods. Wheeled and tracked equipment can be used in the more gently sloping areas, but cable yarding generally is safer and disturbs the soil less. Highlead logging or other logging systems that fully or partially suspend logs damage the soil less and generally are less costly than tractor systems. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Ripping skid trails and landings when the soil is dry improves the growth of trees. Road location and maintenance costs are greater in the more steeply sloping areas.

The soil in this unit is subject to landsliding and slumping when saturated, because it is very plastic and is underlain by highly fractured bedrock.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which can prevent natural or artificial reforestation. Competing weeds, brush, or trees can be controlled by spraying, cutting, girdling, or scarifying. Scarification is less suitable in the steeper areas because of increased expense and soil displacement.

Trees suitable for planting on this unit include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

This map unit is in capability subclass VIe.

35C-Dixonville-Philomath-Hazelair complex, 3 to 12 percent slopes. This map unit is on low foothills adjacent to the Willamette Valley. The vegetation in areas not cultivated is mainly conifers, hardwoods, shrubs, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

This unit is about 30 percent Dixonville silty clay loam, 30 percent Philomath silty clay, and 30 percent Hazelair silty clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Ritner and Witzel soils and Dixonville, Philomath, and Hazelair soils

that have slopes of more than 12 percent. Also included are small areas of Rock outcrop and Orthents. Included areas make up about 10 percent of the total acreage.

The Dixonville soil is moderately deep and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very dark grayish brown silty clay loam about 12 inches thick. The subsoil is dark brown clay about 14 inches thick. Weathered basalt is at a depth of 26 inches.

Permeability of this Dixonville soil is slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Philomath soil is shallow and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very dark brown silty clay about 4 inches thick. The next layer is very dark brown and very dark grayish clay about 15 inches thick. Weathered basalt is at a depth of 19 inches. In some areas of similar soils, the surface layer is cobbly silty clay.

Permeability of this Philomath soil is slow. Available water capacity is about 2 to 4 inches. Depth to soft bedrock and effective rooting depth are 12 to 20 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Hazelair soil is moderately deep and is moderately well drained to somewhat poorly drained. It formed in stratified medium textured and moderately fine textured colluvium derived from mixed sources and overlying older, very clayey material that is underlain by sedimentary bedrock. Typically, the surface layer is very dark grayish brown silty clay loam about 5 inches thick. The subsoil is very dark grayish brown silty clay about 10 inches thick. The substratum is variegated yellowish brown and light yellowish brown, mottled clay about 19 inches thick. Weathered siltstone is at a depth of 34 inches.

Permeability of this Hazelair soil is very slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate. A seasonal high water table is at a depth of 1 foot to 2 feet from December to April.

This unit is used mainly for hay and pasture. It is also used for homesite development, wildlife habitat, and recreation. A few areas of the Dixonville soil are used for timber production.

If this unit is used for hay and pasture, the main limitations are wetness of the Hazelair soil because of the seasonal high water table, the shallow depth to bedrock in the Philomath soil, and the high clay content. Drainage is needed if the Hazelair soil is to be used to its maximum potential.

The soils in this unit are sticky and plastic when wet, which restricts trafficability. Conducting field operations

during periods when the soils are wet reduces tilth and destroys structure, which results in increased runoff and erosion. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching. Grazing when the soils are moist results in compaction of the surface layer, poor tilth, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soils from erosion.

The intricate pattern of the shallow and droughty Philomath soil, the moderately deep and well drained Dixonville soil, and the moderately well drained to somewhat poorly drained Hazelair soil make cultivation of this unit difficult. It is restricted dominantly to small gardens.

Use of fertilizer promotes good growth of forage plants. Grasses respond to nitrogen, and legumes respond to phosphorus, boron, sulfur, and lime.

This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, the potential production per acre is 6,900 cubic feet from an even-aged, fully stocked stand of trees 60 years old or 63,900 board feet (International rule, one-eighth-inch kerf) from an even-aged, fully, stocked stand of trees 90 years old. On the basis of a 50-year site curve, the mean site index is 100. Douglas-fir, grand fir, and Oregon white oak commonly grow on this unit. The main concerns in producing and harvesting timber are equipment limitations, seedling mortality, and plant competition.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy periods. If wheeled and tracked equipment is used on this unit when the soil is moist, puddling and compaction occur. Compaction seriously reduces the productivity of the soil. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Using vehicles that have large, low-pressure tires reduces damage to the soil and helps to maintain productivity. Ripping skid trails and landings when the soil is dry improves the growth of trees.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which can prevent natural or artificial reforestation. Competing weeds, brush; or trees can be controlled by spraying, cutting, girdling, or scarifying.

Trees suitable for planting on the Dixonville soil include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

If this unit is used for homesite development, the main limitations are shallow depth to bedrock, wetness, slow permeability, low soil strength, and shrink-swell potential. Costs of construction to overcome these limitations is high. Construction of houses and roads should be restricted to areas of the Philomath and Dixonville soils. Cuts needed to provide essentially level building sites can expose bedrock. Cutbanks are subject to slumping when the soil is saturated. The bedrock is rippable and therefore is not a serious limitation for most engineering uses.

This unit is poorly suited to septic tank absorption fields because of depth to bedrock, wetness as a result of the seasonal high water table in the Hazelair soil, and slow permeability. Septic tank absorption fields can be installed in some areas of the Dixonville soil where the depth to bedrock is greater. The limitation of slow permeability can be overcome by increasing the size of the absorption field.

Roads and streets can be built if they are designed to compensate for the limited ability of the soils in this unit to support a load. Settling can be minimized by compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling.

If buildings are constructed on this unit, properly designing foundations and footings and diverting runoff away from the buildings help to prevent structural damage because of shrinking and swelling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

This map unit is in capability subclass Vls.

35E-Dixonville-Philomath-Hazelair complex, 12 to 35 percent slopes. This map unit is on low foothills adjacent to the Willamette Valley (fig. 5). The vegetation in areas not cultivated is mainly conifers, hardwoods, shrubs, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

This unit is about 30 percent Dixonville silty clay loam, 30 percent Philomath silty clay, and 30 percent Hazelair silty clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Ritner and Witzel soils and Dixonville, Philomath, and Hazelair soils that have slopes of less than 12 percent. Also included are small areas of Rock outcrop and Orthents. Included areas make up about 10 percent of the total acreage.

The Dixonville soil is moderately deep and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very

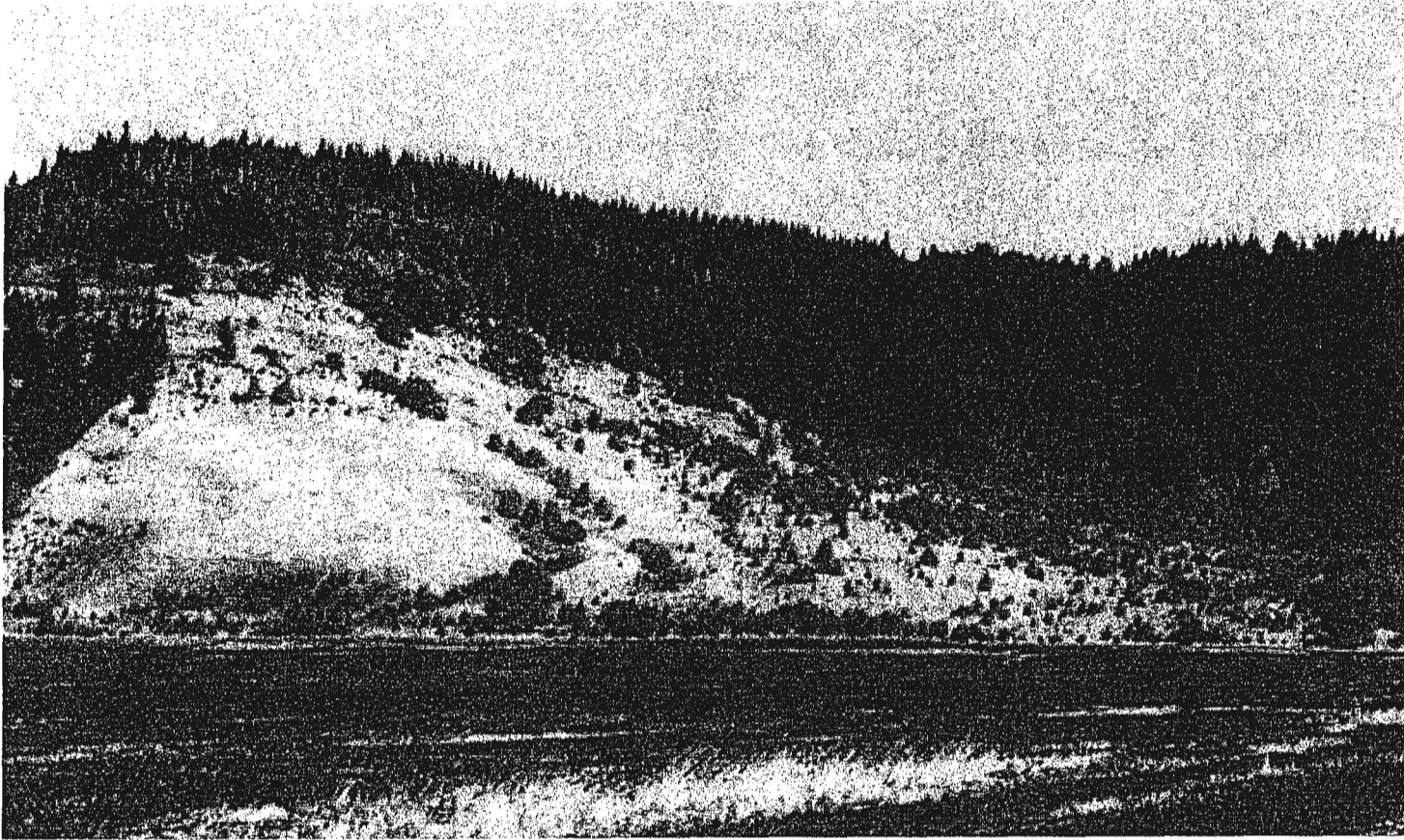


Figure 5.-Typical area of Dixonville-Philomath-Hazelair complex, 12 to 35 percent slopes, on the foot slopes of Rogers Mountain.

dark grayish brown silty clay loam about 12 inches thick. The subsoil is dark brown clay about 14 inches thick. Weathered basalt is at a depth of 26 inches.

Permeability of this Dixonville soil is slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is medium, and the hazard of erosion is moderate to high.

The Philomath soil is shallow and well drained. It formed in colluvium derived dominantly from basic igneous rock. Typically, the surface layer is very dark brown silty clay about 4 inches thick. The next layer is very dark brown and very dark grayish brown clay about 15 inches thick. Weathered basalt is at a depth of 19 inches. In some areas of similar soils, the surface layer is cobbly silty clay.

Permeability of this Philomath soil is slow. Available water capacity is about 2 to 4 inches. Depth to soft bedrock and effective rooting depth are 12 to 20 inches.

Runoff is slow to medium, and the hazard of erosion is slight to moderate.

The Hazelair soil is moderately deep and moderately well drained to somewhat poorly drained. It formed in stratified, medium textured and moderately fine textured colluvium derived from mixed sources and overlying older, very clayey material that is underlain by sedimentary rock. Typically, the surface layer is very dark grayish brown silty clay loam about 5 inches thick. The subsoil is very dark grayish brown silty clay about 10 inches thick. The substratum is variegated yellowish brown and light yellowish brown, mottled clay about 19 inches thick. Weathered siltstone is at a depth of 34 inches.

Permeability of this Hazelair soil is very slow. Available water capacity is about 3 to 6 inches. Depth to soft bedrock and effective rooting depth are 20 to 40 inches. Runoff is medium, and the hazard of erosion is moderate.

to high. A seasonal high water table is at a depth of 1 foot to 2 feet from December to April.

This unit is used mainly for hay and pasture. It is also used for homesite development, wildlife habitat, and recreation. A few areas of the Dixonville soil are used for timber production.

If this unit is used for hay and pasture, the main limitations are wetness of the Hazelair soil, because of the seasonal high water table, the shallow depth to bedrock in the Philomath soil, the high clay content, and slope in some areas. Drainage is needed if the Hazelair soil is to be used to its maximum potential.

The soils in this unit are sticky and plastic when wet, which restricts trafficability. Conducting field operations during periods when the soils are wet can reduce soil tilth and destroy structure, which results in excessive runoff and increased erosion. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching. All tillage should be on the contour or across the slope. Grazing when the soils are wet results in compaction of the surface layer, poor tilth, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from erosion.

The intricate pattern of the shallow and droughty Philomath soil, the moderately deep and well drained Dixonville soil, and the moderately well drained to somewhat poorly drained Hazelair soil makes cultivation of this unit difficult. It is restricted dominantly to small gardens in the less sloping areas.

Use of fertilizer promotes good growth of forage plants. Grasses respond to nitrogen, and legumes respond to phosphorus, boron, sulfur, and lime.

This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, the potential production per acre is 6,900 cubic feet from an even-aged, fully stocked stand of trees 60 years old or 63,900 board feet (International rule, one-eighth-inch kerf) from an even-aged, fully stocked stand of trees 90 years old. On the basis of a 50-year site curve, the mean site index is 100. Douglas-fir, grand fir, and Oregon white oak commonly grow on this unit. The main concerns in producing and harvesting timber are the hazard of erosion, equipment limitations, seedling mortality, and plant competition.

When harvesting timber on this unit, it is essential to use management that minimizes erosion. Erosion can be minimized by not disturbing the soil excessively while logging; by seeding roads, cutbanks, and landings; and by installing water bars or culverts. Proper design of road drainage systems and care in the placement of culverts help to control erosion. Because spoil from excavations is subject to rill and gully erosion and to sloughing, it should be seeded to permanent plant cover.

When moist, unsurfaced roads and skid trails are sticky and plastic. They may be impassable during rainy

periods. If wheeled and tracked equipment is used on this unit when the soil is moist, puddling and compaction occur. Compaction seriously reduces the productivity of the soil. Compaction can be reduced by using suitable methods for removing timber, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. Using vehicles that have large, low-pressure tires reduces damage to the soil and helps to maintain productivity. Ripping skid trails and landings when the soil is dry improves the growth of trees.

The droughtiness of the surface layer increases seedling mortality, especially on south- and southwest-facing slopes. In areas on south-facing slopes that are droughty in summer, seedling mortality can be reduced by providing shade for seedlings. To compensate for the higher mortality rate that can be expected, larger trees or more trees than normal can be planted.

Reforestation must be carefully managed to reduce competition from undesirable plants, which prevent natural or artificial reforestation. Competing weeds, brush, or trees can be controlled by spraying, cutting, girdling, or scarifying.

Trees suitable for planting on the Dixonville soil include Douglas-fir and ponderosa pine.

The understory vegetation commonly growing on this unit includes common snowberry, Pacific poison-oak, rose, western brackenfern, and western hazel.

If this unit is used for homesite development, the main limitations are shallow depth to bedrock, wetness of the Hazelair soil, because of the seasonal high water table slow permeability, slope, low soil strength, and shrink-swell potential. Cost of construction to overcome these limitations is high. Construction of houses and roads should be restricted to areas of Philomath and Dixonville soils.

Cuts needed to provide essentially level building sites can expose bedrock. Cutbanks occasionally slump when the soils in this unit are saturated. The bedrock is rippable and therefore is not a serious limitation for most engineering uses.

The soils in this unit are poorly suited to septic tank absorption fields because of the depth to bedrock, wetness of the Hazelair soil, the seasonal high table, slow permeability, and slope. Septic tank absorption fields may be installed in some areas of the Dixonville soil where the depth to bedrock is greater and the areas are less sloping. The limitation of slow permeability may be overcome by increasing the size of the absorption field. Absorption lines should be installed on the contour.

Slope limits use of the steeper areas of this unit for building site development. Steepness of slope and high content of clay in the subsoil are limitations for dwellings and commercial buildings.

Roads and streets can be built if they are designed to compensate for the limited ability of the soils in this unit to support a load. Settling can be minimized by

compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling.

If buildings are constructed on this unit, properly designing foundations and footings and diverting runoff away from the buildings help to prevent structural damage because of shrinking and swelling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

This map unit is in capability subclass VI.

36D-Dupee silt loam, 3 to 20 percent slopes. This deep, somewhat poorly drained soil is in depressional areas and drainageways of foothills and on alluvial fans. It formed in mixed colluvium derived dominantly from sedimentary rock. The vegetation in areas not cultivated is mainly conifers, hardwoods, sedges, and grasses. Elevation is 300 to 1,400 feet. The average annual precipitation is 40 to 60 inches, the average annual air temperature is 52 to 54 degrees F, and the average frost-free period is 165 to 210 days.

Typically, the surface layer is very dark brown silt loam about 4 inches thick. The next layer is very dark brown silty clay loam about 7 inches thick. The upper 14 inches of the subsoil is brown silty clay loam, and the lower 11 inches is brown silty clay. The substratum to a depth of 65 inches is light olive gray and light gray clay. In some areas of similar included soils, weathered sedimentary rock is at a depth of 40 to 60 inches.

Included in this unit are small areas of Bellpine, Hazelair, Panther, and Willakenzie soils. Included areas make up about 15 percent of the total acreage.

Permeability of this Dupee soil is moderately slow. Available water capacity is 9 to 13 inches. Effective rooting depth is 60 inches or more; however, penetration of roots is restricted by dense clay and a seasonal high water table. Runoff is slow to medium, and the hazard of erosion is slight to high. A seasonal high water table is at a depth of 1.5 to 3.0 feet from December to April.

This unit is used mainly for hay and pasture, small grain, orchards, and limited timber production. It is also used for homesite development, wildlife habitat, and recreation.

If this unit is used for hay and pasture, the main limitations are wetness and the moderately slow permeability of the subsoil. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff. A proper stocking rate, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from erosion. Proper grazing practices, weed control, and fertilizer are needed to ensure maximum quality of forage.

If this unit is used for grain and orchard crops, the main limitations are wetness and slope. Drainage is needed if this unit is to be used to its maximum potential. Unless the unit is drained, long-lived, deep-rooted

deciduous fruit and nut trees, strawberries, caneberries, and alfalfa are adversely affected by the seasonal high water table. Tile drainage can be used to reduce wetness if a suitable outlet is available.

The risk of sheet and rill erosion on the steeper slopes can be reduced by use of gradient terraces and contour farming. Runoff and erosion can be controlled by managing residue, using rough or minimum tillage, growing winter cover crops, or stubble mulching.

In summer, irrigation is needed for maximum production of most crops. Sprinkler irrigation can be used, but water needs to be applied slowly to minimize runoff.

Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Grain and grasses respond to nitrogen; legumes respond to phosphorus, boron, sulfur, and lime; and vegetables and berries respond to nitrogen, phosphorus, and potassium.

This unit is poorly suited to the production of Douglas-fir for saw logs. The seasonal high water table retards the growth of Douglas-fir after about 30 years; the resulting timber is more suitable for posts or pulp than for moist other uses.

If this unit is used for homesite development, the main limitations are wetness, moderately slow permeability, low soil strength, and slope. Drainage is needed if roads and building foundations are constructed. Wetness can be reduced by installing drain tile around footings.

This unit is poorly suited to septic tank absorption fields because of wetness as a result of the seasonal high water table, the moderately slow permeability, and slope. Septic tank absorption fields can be installed in some areas where the depth to the seasonal high water table is greater and the unit is less sloping. Absorption lines should be installed on the contour. The limitation of moderately slow permeability can be overcome by increasing the size of the absorption field.

Buildings and roads should be designed to offset the limited ability of the soil in this unit to support a load. Settling can be minimized by compacting the disturbed areas before construction is begun. Roads need to be provided with large amounts of base rock to prevent settling. The high content of clay in the subsoil makes it necessary to reinforce foundations and footings for buildings.

Slope limits use of the steeper areas of this unit for building site development. Slope is a concern in installing septic tank absorption fields. Access roads should be designed to provide adequate cut-slope grade, and drains are needed to control surface runoff and keep soil losses to a minimum.

This map unit is in capability subclass IIIe.

37D-Flane gravelly loam, 3 to 25 percent slopes. This deep, well drained soil is on broad bench tops and

EXHIBIT 5

LAND USE PLANNING NOTES

Number 3 April 1998

Updated for Clarity April 2010



"STEWARDSHIP IN FORESTRY"

PURPOSE: These technical notes have been developed by the Oregon Department of Forestry (ODF) to help landowners and local governments when they must use an alternative to the USDA Natural Resource Conservation Service (NRCS) Soil Survey or other established data sources to determine the productivity of forestland. Under Oregon Administrative Rules (OAR) 660-006-0005, where sources of data referenced in the rule are not available or are shown to be inaccurate, an alternative method for determining productivity that provides equivalent data may be used. These notes describe the methodologies that the Department of Forestry approves, provides information necessary to use the methodologies and gives direction to counties in evaluating forest productivity reports. Background information is also included to answer commonly-asked questions about forest productivity rating systems. These technical notes and the related tables can be found on the Oregon Department of Forestry's website at:

http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land_Use_Planning.

Please note the Department of Forestry does not measure forest site productivity for landowners. The Department's involvement is focused on establishing a list of approved data sources and methodologies other than those cited in the administrative rule. The Department of Forestry will not issue findings on whether these data sources or alternate methodologies have been employed correctly or if the resulting forest site productivity determinations are accurate. The Department of Forestry is not responsible for verifying field measurements.

Included on page 9 of this guide is a flowchart, which provides a visual aid for counties to step through the process of determining site productivity. Each box in the flowchart is labeled with a number that corresponds to the step and section providing guidance on that topic in these Land Use Planning Notes.

OAR 660-006-0005 (3) Site Productivity Sources are adequate to determine cubic

Step 1: Using Established Data Sources

Forest landowners who would like to demonstrate its forestland productivity or who question the productivity of their property - whether they wish to have it rezoned for development, want approval for template dwellings, or for another reason - must use established data sources to provide information on soils

The Department of Forestry has concluded that to avoid potential confusion and inconsistent productivity determinations it is important for the department to establish a hierarchy of preferences for the site productivity data listed in OAR 660-006-0005 (2) and (3). In order of preference, the department's hierarchy is as follows:

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- A. Natural Resource Conservation Service soil surveys¹
- B. Oregon Department of Revenue Western Oregon site class maps
- C. USDA Forest Service plant association guides
- D. Other existing data sources determined by the State Forester to be of equal or better quality to Items A, B, and C
- E. Alternate methods to develop site productivity data based on direct tree measurements and calculations using applicable Douglas-fir, western hemlock, or ponderosa pine site tables, with priority given to the species among these three that dominates the area being evaluated
- F. Alternate methods based on direct tree measurements and calculations using other native forest tree species site tables
- G. Site-specific soil surveys.

When NRCS soil survey information is available, it should always be considered first when making forest land site productivity determinations. Where the county determines that NRCS or other established data sources approved by the State Forester are available and accurate for determining site productivity at the scale of the tract of interest, the county planning department must make its decision using these data.

If data from an approved established data source (A, B, or C above) do not exist or is shown through site-specific documentation to be inaccurate for determining site productivity at the scale of the tract of interest, only then should other information determined to be of comparable quality by the State Forester (D above) be consulted. These will normally include published data on forest soils or tree measurements. To date, other published forest soils information that has been determined to be of comparative quality includes, but is not limited to, the following:

- August 1997 *Lane County Soil Ratings for Forestry and Agriculture* produced by the Lane County Council of Governments.
- February 8, 1990, *Forest Lands Soils Ratings – Revisions* produced by the Oregon Department of Forestry for the Oregon Department of Land Conservation and Development (applicable to Benton, Lane, Linn, Marion, Polk, and Yamhill Counties except in Lane County where superseded by the August 1997 Lane County Soils Ratings for Forestry and Agriculture).
- January , 27, 1989 forest soils rating submitted to the Oregon Department of Land Conservation and Development by the Oregon Department of Forestry (applicable to Benton, Clackamas, Clatsop, Columbia, Hood River, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill Counties except where superseded by the February 8, 1990 Forest Lands

¹ Web Soil Survey: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/> -- last accessed April 29, 2010. Also see Published Soil Surveys for Oregon available online at: http://soils.usda.gov/survey/printed_surveys/state.asp?state=Oregon&abbr=OR -- last accessed April 30, 2010.

Soils Ratings and in Lane County where superseded by the August 1997
Lane County Soils Ratings for Forestry and Agriculture)

These documents can be found on the Oregon Department of Forestry's website at:
[http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land Use Plan
ning](http://egov.oregon.gov/ODF/STATE_FORESTS/FRP/RP_Home.shtml#Land_Use_Planning) and may be updated over time as new information becomes available.

Additional information may be assessed and approved by the State Forester on a case
by case basis for comparability of quality.

Applicant may use approved ODF
methodology for determining Site Index.

Step 2: Alternate Methodologies

Where the published site productivity data described above in Step 1 are not available,
or when the county determines that it is inaccurate for determining site productivity at
the scale of the tract of interest, the alternate methods for determining site productivity
described below may be used. [Note: Existence of data listed in Step 1 does not
prohibit a landowner from retaining a professional forester or professional soils classifier
to measure the productivity of the land if they believe the published data are inaccurate.
In such cases, the county must determine which data source it will use in making its
decision.]

Alternate methodologies used to measure site productivity must be consistent with the
provisions of this Land Use Planning Note and must be considered in the following
order:

- a. Alternate methods based on direct tree measurements and calculations using
applicable Douglas-fir, western hemlock, or ponderosa pine site tables. The tables
may also be used for grand fir, Sitka spruce, and Jeffrey pine, as indicated in Step
#4 and Attachment A.
- b. If none of these six species are present, the next step is to consider using site tables
for other tree species.
- c. If no adequate trees are present to measure for site productivity, the last available
method is to conduct site-specific soil surveys without direct tree measurements.

Where tree measurements are undertaken, a professional forester who is either
registered as a full member in good standing with the Association of Consulting
Foresters of America or Certified by the Society of American Foresters should be
retained by the landowner to take tree measurements and prepare a report.

Consistent and credible site productivity determinations are an important facet of the
land use planning process. Attempts to consider a variety of methods simultaneously in
hope of arriving at a "preferred" site productivity determination are to be avoided.

EXHIBIT 6



Oregon

Theodore R. Kulongoski, Governor

November 21, 2008

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Dear Mr. Howe:

I am writing to clarify the Oregon Department of Forestry's responsibilities related to specific elements of Oregon Administrative Rule 660-006-0005 (2) and (3). This letter is intended to address recent Lane County public inquiries regarding this administrative rule and was developed following consultations with the Oregon Department of Land Conservation and Development and the Oregon Department of Justice.

Please note that previous Department of Forestry policy position statements or technical findings contained in the May 23, 2008, letter from former Department of Forestry Private Forests Chief Ted Lorensen to Goal One Coalition Executive Director Jim Just that are in conflict with this letter are hereby rescinded and replaced with the policy statements and technical findings articulated here. All other statements in that correspondence remain valid.

Applicable Administrative Rule Language:

OAR 660-006-0005 (2) and (3) state:

2) "Cubic Foot Per Acre" means the average annual increase in cubic foot volume of wood fiber per acre for fully stocked stands at the culmination of mean annual increment as reported by the USDA Natural Resource Conservation Service (NRCS) soil survey information, USDA Forest Service plant association guides, Oregon Department of Revenue western Oregon site class maps, or other information determined by the State Forester to be of comparable quality. Where such data are not available or are shown to be inaccurate, an alternative method for determining productivity may be used. An alternative method must provide equivalent data as explained in the Oregon Department of Forestry's Technical Bulletin entitled "Land Use Planning Notes Number 3 dated April 1998" and be approved by the Oregon Department of Forestry."

(3) "Cubic Foot Per Tract Per Year" means the average annual increase in cubic foot volume of wood fiber per tract for fully stocked stands at the culmination of mean annual increment as reported by the USDA Natural Resource Conservation Service (NRCS) soil survey information, USDA Forest Service plant association guides, Oregon Department of Revenue western Oregon site class maps, or other information determined by the State Forester to be of comparable quality. Where such data are not available or are shown to be inaccurate, an alternative method for determining productivity may be used. An alternative method must provide equivalent data as explained in the Oregon Department of Forestry's Technical Bulletin entitled "Land Use Planning Notes Number 3 dated April 1998" and be approved by the Oregon Department of Forestry." (Emphasis added)

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Using the Best Possible Forest Site Productivity Information:

The administrative rule, in combination with *Land Use Planning Technical Note Number 3*, establishes a hierarchy of forest site productivity information that should be considered in land use decisions subject to the rule. Listed in order of preference, the information sources are:

1. Data sources cited specifically in the administrative rule;
2. Other existing data sources determined by the State Forester to be of comparable quality to the data sources cited specifically in the administrative rule;
3. Alternate methods to develop site productivity data based on direct tree measurements and calculations using applicable Douglas-fir, western hemlock, or ponderosa pine site tables, with priority given to the species among these three that dominates the area being evaluated;
4. Alternate methods based on direct tree measurements and calculations using other native forest tree species site tables; or
5. Site-specific soil surveys.

Applicable existing data from USDA Natural Resource Conservation Service (NRCS) soil survey information, USDA Forest Service plant association guides, Oregon Department of Revenue western Oregon site class maps should always be consulted and used first (Tier 1). If these three data sources are determined by the county and/or NRCS to be inaccurate or do not exist, only then should other applicable, existing data sources determined to be of comparable quality by the State Forester be consulted (Tier 2). Alternate methods for collecting new site productivity data are only needed when data from these first two tiers are determined by the county and/or NRCS to be inaccurate or do not exist. To be approved by the Department of Forestry such alternate methodologies must be consistent with the methodologies described or contemplated in the technical note. Alternate methods based on direct tree measurements and calculations using applicable Douglas-fir, western hemlock, or ponderosa pine site tables (Tier 3) should be considered before using site tables for other tree species (Tier 4) or site-specific soil surveys without direct tree measurements (Tier 5).

Consistent and credible site productivity determinations should be an important facet of the land use planning process. To meet that objective, this hierarchy should be adhered to. Attempts to consider a variety of methods simultaneously in hope of finding a "preferred" site productivity determination should be avoided.

Lane County Data Sources of Comparable Quality

The State Forester has determined the following existing site productivity data sources to be of comparable quality to the data sources cited specifically in the administrative rule when applied on appropriate locations in Lane County:

1. February 8, 1990, *Forest Lands Soils Ratings – Revisions* produced by the Oregon Department of Forestry
2. Undated *Lane County Forest Soils Ratings* based on published Soil Conservation Service data and the February 9, 1990, Oregon Department of Forestry report
3. August 1997 *Lane County Soil Ratings for Forestry and Agriculture* produced by the Lane County Council of Governments

No further Department of Forestry review or approval of site productivity determinations are needed when these data sources are used.

Ponderosa Pine in the Willamette Valley

In most western Oregon locations where both Douglas-fir and ponderosa pine are present, Douglas-fir will be the dominant species and, therefore, whenever possible that species should be used for selecting site trees. In infrequent cases where ponderosa pine is the dominant species in western Oregon, *Land Use Planning Technical Note Number 3* states that Meyer's ponderosa pine site table may be used in calculations of site productivity. However, the technical note also states Meyer's site table must not be used for ponderosa pine in the Willamette Valley. For the purpose of implementing this section of the technical note, the Department of Forestry will rely on the definition provided in OAR 660-033-0020 (12) in which "Willamette Valley" means "Clackamas, Linn, Marion, Multnomah, Polk, Washington and Yamhill Counties and that portion of Benton and Lane Counties lying east of the summit of the Coast Range."

The Department of Forestry has not been able to locate credible site index or yield tables for ponderosa pine applicable in the Willamette Valley. In a May 23, 2008, letter, Ted Lorensen noted that the department had used tables for ponderosa pine from Douglas County for the Forest Resource Trust, and that in the current absence of standard tables, ODF "would likely approve of methodology using the pine tables for Douglas County and appropriate interpolation." However, the Department of Forestry has since determined that interpolation of either Douglas County or Eastern Oregon ponderosa pine yield tables for the more highly productive Willamette Valley would not be technically sound.

Instead, energy should be focused on obtaining or developing, if possible, technically credible Willamette Valley-specific ponderosa pine site index tables. The Department of Forestry is willing to work cooperatively with county governments, Oregon State University Forestry Extension, forest landowners, and other parties to develop such information. Until a credible Willamette Valley ponderosa pine site table becomes available and is acknowledged in a revised ODF Technical Note, the Department of Forestry's position is that it is inappropriate to use ponderosa pine to determine site productivity for under OAR 660-006-0005

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(2) and (3) in the Willamette Valley and use of such methodologies cannot be approved by the agency.

Outside the Willamette Valley, Meyer's ponderosa pine site table may continue to be used on sites where ponderosa pine is the dominate species and the Tier 1 and Tier 2 site productivity data sources cited above are determined by the county and/or NRCS to be inaccurate or do not exist.

Stockable Area

Cubic foot site productivity determinations assume fully stocked stands. In this context, "stockable area" means the proportion of an area that can be physically stocked with trees. Rock outcrops, impervious soils, or high water tables are examples of factors that may result in less than 100 percent of the site being stockable. The technical note anticipates this issue by referencing the USDA Forest Service Pacific Northwest Research Station *Field Instructions for forest surveys in Washington, Oregon, and Northern California* where consideration of stockable area factors are addressed. Upon request by a county government, the Department of Forestry will evaluate and consider approval of reductions in site productivity from fully stocked stand levels based on such factors.

Limits on Department of Forestry Approvals

As stated in the technical note, the Department of Forestry does not measure site productivity for landowners. The Department of Forestry's involvement in site productivity determinations applicable to Oregon Administrative Rule 660-006-0005 (2) and (3) is in evaluating the quality of existing data sources other than those cited in the rule and evaluating alternative methodologies with respect to the technical note. The Department of Forestry will not issue findings on whether these data sources or alternate methodologies have been employed correctly or if the resulting site productivity determination are accurate. The Department of Forestry is not responsible for verifying field measurements.

Oregon Forest Practices Act Minimum Site Productivity Requirements for Reforestation

While not directly applicable to land use planning decisions, Department of Forestry believes it is important to note the Oregon Board of Forestry has established that all forestlands with a site productivity of at least 20 cubic feet per acre per year shall be subject to the reforestation requirements of the Oregon Forest Practices Act.

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Mr. Kent Howe
November 21, 2008
Page 5

In summary, the content of this letter is intended to further explain, and not alter, the requirements of Oregon Administrative Rule 660-006-0005 (2) and (3) and *Land Use Planning Technical Note Number 3*. Please contact me if you have any questions. If unresolved issues continue to arise, clarifying changes to the administrative rule and/or the Technical Note may eventually be necessary and the Department of Forestry will work together with county governments, the Oregon Department of Land Conservation and Development, and other interested parties on such changes.

Sincerely,


David Morman, Director
Forest Resources Planning Program

cc: Katherine Daniels, DLCD
Carmel Bender, DLCD
Michele Logan, DOJ

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EXHIBIT 7

ds-47i

2-7-90

LINN COUNTY FOREST SOIL RATINGS

SCS #	SCS Name	(Site Index) Rating	SCS Acreage	Cuft/Ac per
007	Awbrig sicl	3	9985	est 40
008	Bashaw sic	3	25635	
010E	Bensley st 1, 2-30%	Medium 110	1915	84
011F	Bensley-Valsetz st 1 s, 30-50%	Medium 112	4470	87
011G	Bensley-Valsetz st 1 s, 50-75%	Medium 112	6855	87
018	Camas gr sl	3	2185	est 40
020C	Cehalem sil, 3-12%	2	675	est 60
022C	Cehulpum sil, 3-12%	3	1215	est 40
022E	Cehulpum sil, 12-35%	3	740	est 40
027	Concord sil	3	10835	
028	Conser sicl	3	9955	est 45
029	Courtney gr sicl	3	8500	est 40
030D	Crabtree st 1, 2-25%	Medium 105	415	71
030F	Crabtree st 1, 25-45%	Medium 105	2070	71
030G	Crabtree st 1, 45-75%	Medium 105	4190	71
033	Dayton sil	3	59075	est 40
035C	Dixonville-Philomath-Hazelair, 3-12%	Low	3935	est 45
035E	Dixonville-Philomath-Hazelair, 12-35%	Low	5215	est 45
036D	Dupee sil, 3-20%	Medium	4100	est 70 *
039	Fluvents-Fluvaquents, nearly level	3	10100	est 60
042H	Harrington-Rock outcrop, 50-90%	Medium 140	2980	85
043B	Hazelair sicl, 2-7%	Low	8000	est 45
043D	Hazelair sicl, 7-20%	Low	5715	est 45
045F	Henline-Yellowstone-Rk Op, 25-50%	Low 84	5495	73
045H	Henline-Yellowstone-Rk Op, 50-90%	Low 84	9395	73
065B	Marcola cob sicl, 2-7%	Medium	1760	est 80
071F	Mulkey 1, 25-50%	Low 110	855	84
077A	Pengra sil, 1-4%	2	2125	est 70
078C	Philomath sic, 3-12%	Low	1205	est 45
079C	Philomath cob sic, 3-12%	Low	2940	est 45
079F	Philomath cob sic, 12-45%	Low	6600	est 45
080	Pits	3	770	
085	Riverwash	3	2275	
086G	Rock outcrop-Orthents, steep	Low	4430	est <20
094B	Stayton sil, 0-7%	Low	915	est 60
095C	Steiber sil, 3-12%	2	795	est 80
095D	Steiber sil, 12-20%	2	850	est 80
095F	Steiber sil, 20-50%	2	635	est 80
096E	Valsetz st 1, 3-30%	Medium 115	615	91
097E	Valsetz-Yellowstone st 1's 3-30%	Low 99	925	79
097H	Valsetz-Yellowstone st 1's, 30-90%	Low 99	3465	79
098	Waldo sicl	3	6800	est 45
099	Wapato sicl	3	4920	
100	Whiteson sil	3	3010	est 45
103C	Witham sic, 2-12%	3	1275	est 45
104E	Witzel v cob 1, 3-30%	Low 115	5600	106
104G	Witzel v cob 1, 30-70%	Low 115	2620	106
105C	Witzel Variant v cob sil, 0-12%	Low	1545	est 100

**Lane County Soil Ratings for Forestry
August 2011 Update**

Map Symbol	Soil Map Unit	NRCS Site Index	NRCS Cu. Ft./ Acre/Year	ODOF Cu. Ft./ Acre/Year	Notes
21E	Bullards-Ferrelo loams, 12 - 30% slopes	No rating	---	est. 80	
21G	Bullards-Ferrelo loams, 30 - 60% slopes	No rating	---	est. 80	
23	Camas-Urban land complex	No rating	---	est. 20	
24	Chapman loam	No rating	---	est. 140	
25	Chapman-Urban land complex	No rating	---	est. 100	
26	Chehalis silty clay loam, occasionally flooded	No rating	---	est. 100	
27	Chehalis-Urban land complex	No rating	---	est. 90	
28C	Chehulpum silt loam, 3 - 12% slopes	No rating	---	est. 40	
28E	Chehulpum silt loam, 12 - 40% slopes	No rating	---	est. 40	
29	Cloquato silt loam	No rating	---	est. 120	
30	Cloquato-Urban land complex	No rating	---	est. 100	
31	Coburg silty clay loam	No rating	---	est. 100	
32	Coburg-Urban land complex	No rating	---	est. 90	
33	Conser silty clay loam	No rating	---	est. 45	
34	Courtney gravelly silty clay loam	No rating	---	est. 40	
36D	Cumley silty clay loam, 2 - 20% slopes	114	162	---	
37C	Cupola cobbly loam, 3 - 12% slopes	100	136	---	
37E	Cupola cobbly loam, 12 - 30% slopes	100	136	---	
38	Dayton silt loam, clay substratum	No rating	---	est. 40	
39E	Digger gravelly loam, 10 - 30% slopes	102	140	---	
39F	Digger gravelly loam, 30 - 50% slopes	102	140	---	
40H	Digger-Rock outcrop complex, 50 - 85% slopes	No rating	---	114	
41C	Dixonville silty clay loam, 3 - 12% slopes	109	152	---	
41E	Dixonville silty clay loam, 12 - 30% slopes	109	152	---	
41F	Dixonville silty clay loam, 30 - 50% slopes	109	152	---	
42E	Dixonville-Hazelair-Urban land complex, 12 - 35% slopes	No rating	---	est. 35	
43C	Dixonville-Philomath-Hazelair complex, 3 - 12% slopes	No rating	---	est. 45	}
43E	Dixonville-Philomath-Hazelair complex, 12 - 35% slopes	No rating	---	est. 45	
44	Dune land	No rating	---	---	No trees expected
45C	Dupee silt loam, 3 - 20% slopes	No rating	---	est. 70	
46	Eilertsen silt loam	133	199	---	
47E	Fendall silt loam, 3 - 30% slopes	125	184	---	

>

Exhibit 12
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EXHIBIT 8

**TIMBER CRUISE
HIDDEN VALLEY ROAD
PROPERTY**

Prepared
for
Carol Cromwell

Prepared by
Marc E. Setchko
Consulting Forester
October 7, 2011

Exhibit 12
Page 26 of 33

**TIMBER CRUISE
HIDDEN VALLEY ROAD
PROPERTY**

Location: The subject property is located in T12S, R1W, Section 7. It is approximately 5 miles northeast of Lebanon, Oregon, on Hidden Valley Road. The entire property is ±15.25 acres; 14 acres were cruised for this report. The remaining 1.25 acres are in open grassy areas (in the eastern portion of the parcel) and the homesite (in the western portion of the parcel). The homesite covers a small footprint, as trees are growing close to the home on two sides. Access is via a rocked road to the residence and outbuildings, with dirt roads into the timber.

Terrain throughout the parcel is flat to moderate, with some of the western portion approaching 30%. All of the timber could be shovel logged.

Timber cover is Douglas-fir and white oak, with a few ponderosa pine and maples.

Cruise Method: The timbered area was cruised using a 200' by 200' grid, with extra count plots taken along lines of travel. A total of 37 plots were taken with a 25.1 basal area factor.

Summary of Cruise Results: 14 cruised acres - 32' logs

	Gross Vol/ac (MBF)	Net Vol/ac (MBF)	Grade (% of Net Vol)					Total Volume (MBF)
			2M	3M	Rough 3M	4M	5M	
Douglas-fir	8,150	7,193	19	59		22		100.7

Volume by Log Diameters:

	DF (MBF)	% VOL
6"	21.9	21.7
7-8"	27.6	27.4
9"	7.2	7.2
10"	10.3	10.2
11"	14.7	14.6
12-14"	13.2	13.1
15-18"	5.8	5.8
19-23"		
24+		
	100.7	100.0

Other Data:	BA/ac	Average Tree			Average Log		
		DBH	HGT	Gr-BF	Len	Dib	Gr-BF
Douglas-fir	69	14.4"	1.6 logs	146	26'	8"	48

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EXHIBIT 9

**A Compilation
Of
Yield Tables
For
Northwest Species**

By:

**Atterbury Consultants, Inc.
3800 SW Cedar Hills Blvd., #190
Beaverton, OR 97005
(503) 646-5393
FAX: (503) 644-1683
<http://www.atterbury.com>**

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Exhibit 12
Page 28 of 33

WHAT ARE SITE QUALITY AND SITE INDEX ?

Site quality is the integrated effect of the physical properties of the area on which trees are growing. Soil depth, soil texture, annual or seasonal precipitation, temperature, altitude, slope, and aspect are considered to be major influences on site quality. Relatively minor changes in these factors may impact site quality dramatically.

Site Index is the index of site height at some base age.

The author of the yield table determined the class of trees used to calculate site height. Generally they are dominants or combinations of dominant and codominant trees. If the user selects a different class of trees for Site Index determination, his results will not match the yield table values.

Site height trees should be free of height growth deformation.

Site Index should be determined for each species in the cruise sample.

Different species may have different site indexes even when growing side by side.

Age at breast height is determined by the ring count of an increment core of each sample tree. Total age is breast height age plus the age to breast height given by the author.

Site Indexes Grouped By Site Quality Class

Spd	Site Index Base	Site Quality Class				
		Class I	Class II	Class III	Class IV	Class V
Douglas fir	base 50	160--136	134--116	114--96	94--76	74--50
Western Hemlock	base 50		130--120	110--100	90--80	70 & <
Red Alder	base 50					
Douglas fir	base 100	210--190	180--160	150--130	120--100	90--70
Western Hemlock	base 100	210--190	180--160	150--130	120--100	90--70
Red Alder	base 100	210--190	180--160	150--130	120--100	90--70
Ponderosa Pine	base 100	160	140	120	100	80
Lodgepole Pine	base 100			120	100	80

TABLE 2

DOUGLAS FIR EMPIRICAL YIELD TABLE

SOURCE: For Douglas fir tables 2 through 10, D.N.R. Report No. 20 - May 1971, "Empirical Yield Tables for the Douglas fir Zone" by Charles Chambers, and Franklin Wilson; "Comprehensive Tree Volume Tarif Tables" by Dr. K. J. Turnbull, Gene Little, and Gerald Hoyer, June 1972. Stepwise multiple regression conversion made by Tom Wheatley, Publishers Paper Co., June 1978.

SITE 70

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	---	---	---	---	---	---
26	9	8.25	---	---	---	---
30	38	8.57	517	517	1,185	.436
40	91	9.36	1,874	1,847	4,196	.440
41	96	9.44	2,004	1,963	4,554	.431
50	128	10.11	3,126	3,008	8,115	.371
60	158	10.80	4,275	4,138	12,572	.329
70	182	11.43	5,320	5,196	17,176	.302
80	202	11.98	6,261	6,141	21,544	.285
90	220	12.43	7,099	6,941	25,350	.274
100	235	12.78	7,833	7,574	28,374	.267
110	249	13.01	8,463	8,021	30,405	.264
120	261	13.10	8,989	8,266	31,279	.264
130	273	13.04	9,412	8,297	30,900	.269

TABLE 3

SITE 80

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	---	---	---	---	---	---
26	26	8.52	269	269	633	.425
30	55	8.91	921	921	1,614	.570
40	108	9.87	2,479	2,330	5,870	.397
41	113	9.96	2,630	2,467	6,342	.389
50	146	10.79	3,934	3,707	11,118	.333
60	175	11.65	5,285	5,060	17,062	.297
70	199	12.45	6,532	6,330	23,187	.273
80	219	13.17	7,675	7,473	29,038	.257
90	237	13.79	8,715	8,454	34,240	.247
100	252	14.31	9,651	9,251	38,541	.240
110	266	14.71	10,482	9,842	41,709	.236
120	279	14.97	11,211	10,216	43,565	.235
130	290	15.08	11,835	10,365	44,000	.236

TABLE 4

SITE 90

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	---	---	---	---	---	---
26	49	8.91	777	777	1,351	.575
30	77	9.36	1,506	1,426	2,708	.526
40	128	10.49	3,256	2,985	8,393	.356
41	132	10.60	3,425	3,145	9,019	.349
50	165	11.57	4,902	4,591	15,209	.302
60	193	12.60	6,444	6,160	22,777	.270
70	217	13.56	7,893	7,630	30,483	.250
80	236	14.44	9,217	8,949	37,795	.237
90	254	15.23	10,448	10,087	44,347	.227
100	269	15.90	11,576	11,016	49,807	.221
110	283	16.45	12,599	11,726	53,977	.217
120	295	16.87	13,519	12,204	56,690	.215
130	306	17.14	14,335	12,432	57,813	.215

EXHIBIT 10

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EXHIBIT 11

SMALL DIAMETER TREE

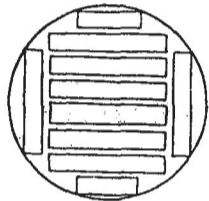
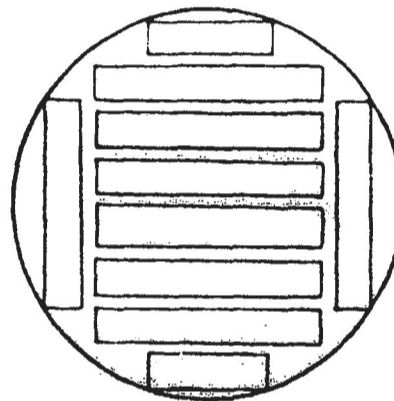


Figure 5. Diagram Showing 1-Inch Boards That Can be Cut.

LARGE DIAMETER TREE



The cubic foot volume includes every thing within the circles. The Scribner board foot volume is the area from which the boards are cut. From these diagrams it can be seen that the ratio between the cubic volume (which includes the area around the outside of the boards shown) and Scribner volume decreases as the tree increases in size. The percentage of the area within the scaling cylinder, which can be cut into boards, i.e, Scribner volume, increases as the tree gets larger. This is why the cubic foot per Scribner board foot ratio decreases over time as the tree grows larger.

EXHIBIT 12

Step 6. Calculate periodic annual increment (PAI)

The average annual volume growth of a timber stand measured over a specific period is its periodic annual increment (PAI). This figure is useful because volume growth per acre can vary substantially as the stand ages. The PAI of either board-foot or cubic-foot volumes can be calculated for any period, but 5- or 10-year periods are most common. Calculate PAI:

$$\text{Periodic annual increment} = \frac{\text{Total volume/acre at end of period} - \text{Total volume/acre at beginning of period}}{\text{Number of years in the period}}$$

PAI can measure previous growth or project future growth. Core samples enable you to take measurements back from the present, and your calculated growth projection factor enables you to estimate a future periodic annual increment. This enables you to determine how your stand is growing by taking a "snapshot" in time.

Hypothetical ideal harvest time

Foresters have a long tradition of analyzing timber stand growth. Figure 5 shows the growth pattern for Douglas-fir, but the pattern for even-age stands tends to be similar for all tree species.

From analyses and long experience, foresters have derived the general rule that when PAI falls below MAI, the timber stand is "mature"—that is, it has passed its peak of wood growth production in the biological sense. Thus, the stand might be harvested if growth rate is the overriding factor in the harvest decision.

The point where the PAI line crosses the MAI line also is the highest value for MAI. This point, therefore, is referred to as *culmination* of MAI. The stand will continue to add volume after this point but at a slower rate than before. Thus, by comparing estimates of PAI and MAI, we can test whether our stands are biologically mature. Thinning stands can boost the growth of residual trees and delay the culmination of MAI.

Often, factors such as cash flow or market cycles dictate a timber harvest before or after culmination of MAI. By

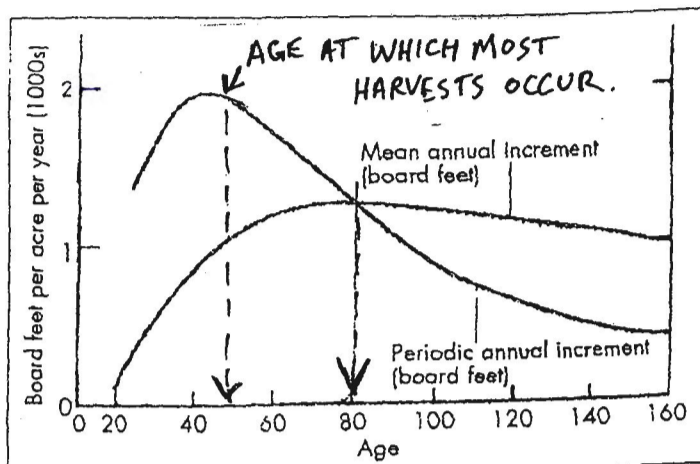


Figure 5.—Periodic and mean annual increments of board-foot volume for Douglas-fir, showing culmination of mean annual increment at about 80 years. Absolute age of culmination varies, but the pattern in this graph is similar for all species. Adapted from McArdle et al., *The Yield of Douglas Fir in the Pacific Northwest*, USDA Technical Bulletin 201, 1961.

combining this biological information with financial analysis, you can tailor your management decisions to your own situation and objectives.

Where to go from here

Good stand information is essential to making the decisions necessary for managing your woodland property. Stand measurements are critical to logging and marketing options. They are also important as indicators of a stand's health and vigor and its susceptibility to insect and disease problems. And, measurements might be important in deciding whether a harvest operation will generate the desired cash flow.

Measurements taken according to the procedures described here are suitable for understanding how a timber stand may develop over time; however, they're no substitute for professional timber appraisals or inventories done by foresters.

If you want to refine these techniques or to study timber growth further, contact your Extension forestry agent for possible opportunities.

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EXHIBIT 13

APPENDIX

Background and Additional Information:

Table 1. CUBIC FOOT PRODUCTIVITY CLASSES

<u>CLASS</u>	<u>POTENTIAL YIELD-MEAN ANNUAL INCREMENT</u>
1	225 or more cu.ft./ac./yr.
2	165 to 224 cu.ft./ac./yr.
3	120 to 164 cu.ft./ac./yr.
4	85 to 119 cu.ft./ac./yr.
5	50 to 84 cu.ft./ac./yr.
6	20 to 49 cu.ft./ac./yr.

The Department of Forestry advises using the USDA Cubic Foot Productivity Class⁹ system, as opposed to other systems of measure, when making land use planning decisions because it measures the relative productivity of the soil, is not dependent upon the condition of the forest or the species of trees currently growing on the site, and is more consistent than other measures. The cubic foot productivity class system reveals the average growth rate of timber over the life of the stand measured at the peak of that average growth rate. Table 1 above shows the potential timber yields of productivity classes 1 - 6 in cubic feet per acre per year (cu.ft./ac./yr.).

Other measures that might be used to compare productivity, such as site class or site index, are not consistent between species. Site class is commonly used on the west side to describe the productivity of Douglas-fir forests, but not other species. Site index measures productivity as a function of age and is calculated as tree height divided by tree age at a base age of 100 or 50. Since on the same area, in the same length of time, different species grow to different heights, site index is not consistent between species. For example, two species with the same site index will yield different cubic foot ratings, as seen in Table 2 below.

Table 2. RATING SYSTEM COMPARISONS¹⁰

<u>Site Index Table</u>	<u>Site indices</u>	<u>Cubic foot comparisons</u>
Douglas-fir (50 yr King Site Index)	100	136
Douglas-fir (100 yr McArdle Site Index)	100	84
Western Hemlock (100 yr Barnes Site Index)	100	142
Ponderosa Pine (100 yr Meyer Site Index)	100	102
White Fir (100 yr Schumacher Site Index)	100	218
Engelmann Spruce (100 yr Alexander Site Index)	100	109

⁹ Field instructions for forest surveys in Washington, Oregon, and Northern California. USDA Forest Service, PNW Range and Experiment Station.

¹⁰ Based on: USDA Soil Conservation Service. 1986. Culmination of Mean Annual Increment for Commercial Forest Trees of Oregon. Technical Note No.2 Forestry Revised June 1986. Portland Oregon.

Rich Catlin

From: BIRCH Kevin R [kevin.r.birch@state.or.us]
Sent: Thursday, November 10, 2011 9:06 AM
To: Rich Catlin
Cc: KNOTTS Bradley A
Subject: RE: Forester Information

Mr. Catlin,

I'm sorry but we no longer do this type of review for land use applications. The concern is that some people have been interpreting our approval of the methodology used to calculate the productivity of a site as an approval of the conclusions of the consulting forester's report. This implies that we concur with a finding that the parcel is non-forest land, and in essence puts us in the role of making the land use decision, which is the County's role.

In April of 2010, we updated our land use planning notes for clarity.

[http://www.oregon.gov/ODF/STATE FORESTS/FRP/docs/LandUsePlanningNotes3FINAL.pdf](http://www.oregon.gov/ODF/STATE_FORESTS/FRP/docs/LandUsePlanningNotes3FINAL.pdf)

In the second paragraph of the update we say, "Please note the Department of Forestry does not measure forest site productivity for landowners. The Department's involvement is focused on establishing a list of approved data sources and methodologies other than those cited in the administrative rule. The Department of Forestry will not issue findings on whether these data sources or alternate methodologies have been employed correctly or if the resulting forest site productivity determinations are accurate. The Department of Forestry is not responsible for verifying field measurements."

Budgets are tight, and the Department of Forestry is not funded to be involved on a case by case basis in land use planning decisions. One of the things we were trying to do with the updated land use planning note was to provide enough information to assist the counties in making these determinations. If a county cannot understand the methodology described in the land use planning note, we will provide training to the county on how to make this type of determination, but we will no longer be making this type of determination for them.

Kevin Birch
Director, Forest Resources Planning Program
Oregon Department of Forestry
Work - 503-945-7405
Cell - 503-871-2814

Exhibit <u>13</u>
Page <u>1</u> of <u>1</u>

11/10/2011

County Courthouse, Room 115
PO Box 100 Albany, OR 97321

**Linn County Department of Health Services
Environmental Health Program**

Phone (541) 967-3821
Fax (541) 926-206
Rec. # 30708

REPORT OF EVALUATION FOR ON-SITE SEWAGE DISPOSAL

(Technical Report - This is not a Permit)

Applicant: **CROMWELL, CAROL**

Map PIN: **12S01W07 00903**

Site Location: The southwest corner of the subject property is the southern 1/4 corner of section 7.

Subdivision:

Block:

Lot:

Lot Designation:

Property Size: **15 AC**

Zoning: **FF**

Sewer Available:

System Capacity: gallons / day : Four (4) bedroom single family dwelling

This approval is limited to residential strength wastewater.

Existing Tank:

Test Water-Tightness:

Required Tank Capacities (gallons):

Septic:

Dosing: (if needed)

Effluent Filter Required:

System Requirements

Initial Disposal Area

Replacement Disposal Area

System Type:

Min Trench Depth:

inches

inches

Max Trench Depth:

inches

inches

Sizing Ratio:

feet / 150 gallons

feet / 150 gallons

Sizing Criteria:

Total Trench Length:

feet

feet

Curtain Drain Required:

Min Curtain Drain Depth: inches

Inspection of System Stakeout Required:

Detailed site-specific plans must be submitted for review and approval before permit is issued.

See attached table of required setbacks. All site developments must adhere to the listed setbacks, or this report may be invalidated.

System may only be installed when soils are dry, generally June through October. Installation during other times of the year may be considered on a case by case basis.

This evaluation is for the central parcel, proposed Lot B (5.01 acres).

THIS IS NOT A PERMIT

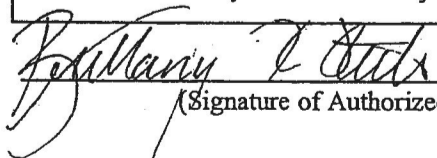
This is a technical report for on-site sewage disposal only. Partitioning the subject property, or altering natural conditions may void this report. Technical rule changes may require use of a different type sewage disposal system.

This report may be converted to a permit for a sewage disposal system only if the application includes a favorable Land Use Compatibility Statement. It is a violation of ORS 240.71-130 (15)(e) to install, alter or repair the system without first obtaining a permit to do so.

WARNINGS:

Any alteration of the natural conditions in the area approved for the on-site system or replacement area may void this approval. This approval is given on the basis that the lot or parcel described will not be further partitioned or subdivided and that conditions on subject or adjacent properties have not been altered in any manner which would prohibit issuance of a permit in accordance with O.R.S. 454.605 through 454.755 and Administrative Rules of the Environmental Quality Commission. Any such subdivision, partitioning or alteration may void this report.

This document is a technical report for on-site sewage disposal only. It may be converted to a permit only if, at the time of application, the parcel has been found to be compatible with applicable LCDG-Goals. The Statement of Compatibility may be made on the attached form or its equivalent. Authorized Agent approval is required before a construction permit can be issued. This report is valid until an on-site sewage disposal system is installed pursuant to a construction permit obtained from Linn County Environmental Health, or until earlier cancellation, pursuant to Commission rules, with written notice thereof by the Department of Environmental Quality to the owners according to Department records or the County Tax records. Subject to the foregoing, this report runs with the land and will automatically benefit subsequent owners.


(Signature of Authorized Agent)

EHS
(Title)

8.2.2007
(Date)

Linn Co. Env. Health
(Office)

Exhibit 14



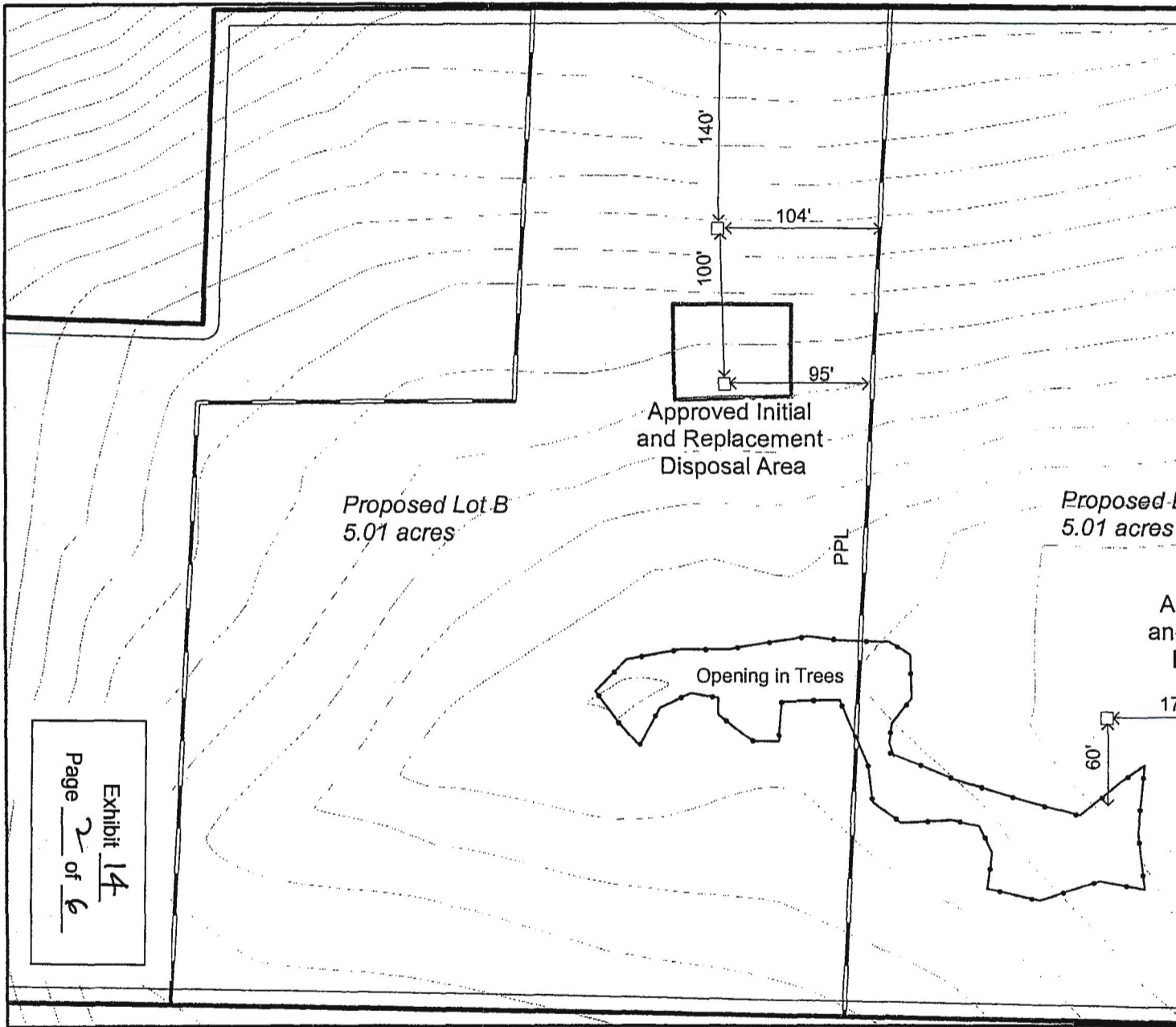
County Courthouse, Room 115
PO Box 100 Albany, OR 97321

Linn County Department of Health Services Environmental Health Program

Phon
Fax (541)926-

Site Evaluation Plot Plan

Property ID: 12S01W07 00903
Record Number: 30708
Date Produced: 8/2/2007



- ⊙ Wells
- ▲ Holding tanks
- Test pits
- ▭ Disposal areas



1 inch equals 100 feet

Exhibit 14
Page 2 of 6



County Courthouse, Room 115
PO Box 100 Albany, OR 97321

Linn County Department of Health Services Environmental Health Program

Phone
Fax (503) 926-

Site Evaluation Plot Plan

Property ID: 12S01W07 00903
Record Number: 30708
Date Produced: 8/2/2007

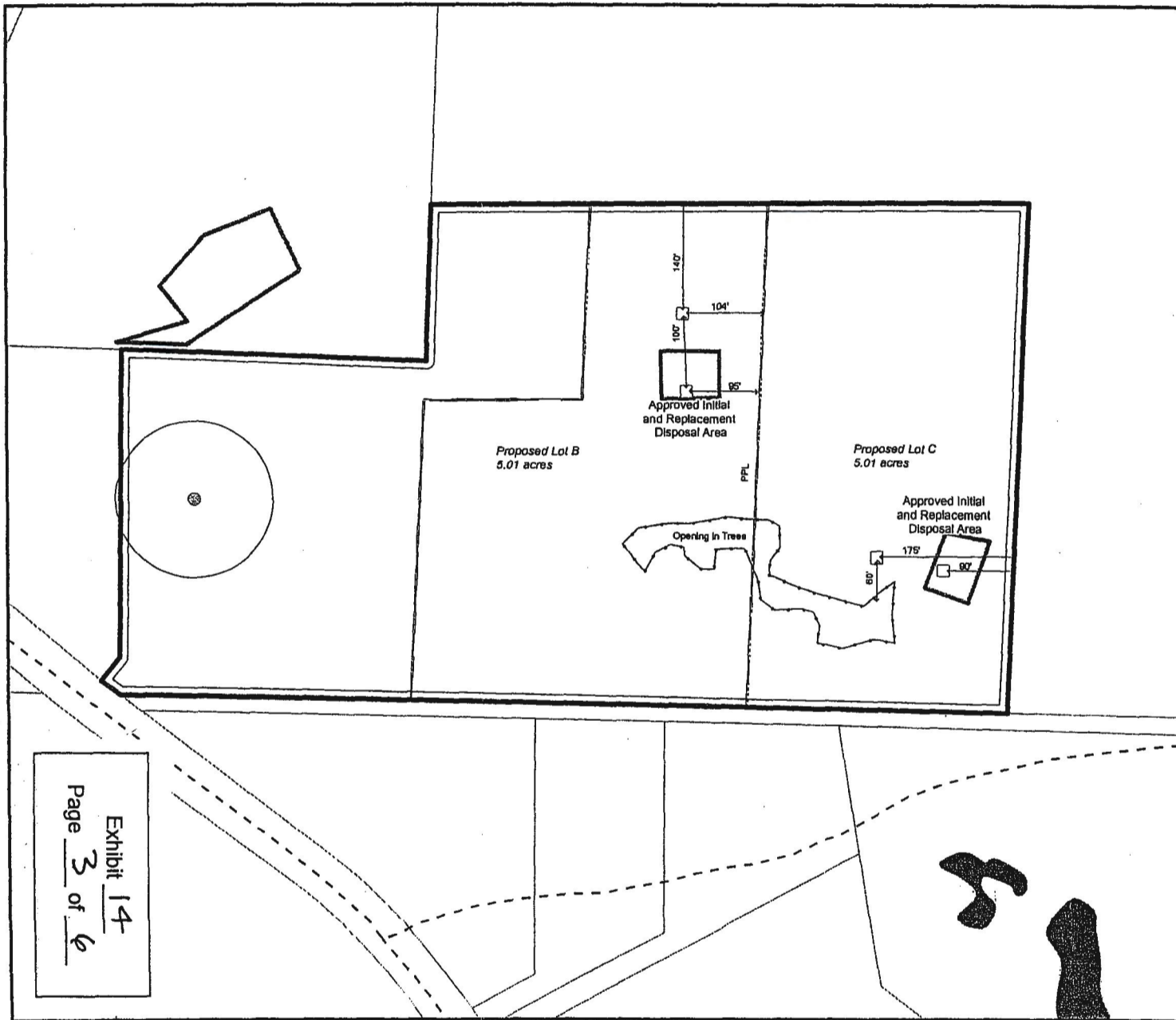


Exhibit 14
Page 3 of 6

- ⊙ Wells
- △ Holding tanks
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1 inch equals 200 feet

County Courthouse, Room 115
PO Box 100 Albany, OR 97321

**Linn County Department of Health Services
Environmental Health Program**

Phone (541) 967-3821
Fax (541) 926-206
Rec. # 30709

REPORT OF EVALUATION FOR ON-SITE SEWAGE DISPOSAL

(Technical Report - This is not a Permit)

Applicant: **CROMWELL, CAROL**

Map PIN: **12S01W07 00903**

Site Location: The southwest corner of the subject property is the southern 1/4 corner of section 7.

Subdivision:

Block:

Lot:

Lot Designation:

Property Size: **15 AC**

Zoning: **FF**

Sewer Available:

System Capacity: gallons / day : Four (4) bedroom single family dwelling

This approval is limited to residential strength wastewater.

Existing Tank:

Test Water-Tightness:

Required Tank Capacities (gallons):

Septic:

Dosing: (if needed)

Effluent Filter Required:

System Requirements

Initial Disposal Area

Replacement Disposal Area

System Type:

Min Trench Depth:

inches

inches

Max Trench Depth:

inches

inches

Sizing Ratio:

feet / 150 gallons

feet / 150 gallons

Sizing Criteria:

Total Trench Length:

feet

feet

Curtain Drain Required:

Min Curtain Drain Depth: inches

Inspection of System Stakeout Required:

Detailed site-specific plans must be submitted for review and approval before permit is issued.

See attached table of required setbacks. All site developments must adhere to the listed setbacks, or this report may be invalidated.

System may only be installed when soils are dry, generally June through October. Installation during other times of the year may be considered on a case by case basis.

This evaluation is for the eastern parcel, proposed Lot C (5.01 acres).

THIS IS NOT A PERMIT

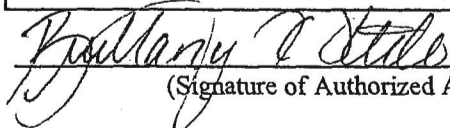
This is a technical report for onsite sewage disposal only. Partitioning the subject property, or altering natural conditions may void this report. Technical rule changes may require use of a different type sewage disposal system.

This report may be converted to a permit for a sewage disposal system only if the application includes a favorable Land Use Compatibility Statement. It is a violation of OAR 340-71-130 (15)(a) to install, alter or repair the system without first obtaining a permit to do so.

WARNINGS:

Any alteration of the natural conditions in the area approved for the on-site system or replacement area may void the approval. This approval is given on the basis that the lot or parcel described will not be further partitioned or subdivided and that conditions on subject or adjacent properties have not been altered in any manner which would prohibit issuance of a permit in accordance with O.R.S. 454.605 through 454.755 and Administrative Rules of the Environmental Quality Commission. Any such subdivision, partitioning or alteration may void this report.

This document is a technical report for on-site sewage disposal only. It may be converted to a permit only if, at the time of application, the parcel has been found to be compatible with applicable LCDC-Goals. The Statement of Compatibility may be made on the attached form or its equivalent. Authorized Agent approval is required before a construction permit can be issued. This report is valid until an on-site sewage disposal system is installed pursuant to a construction permit obtained from Linn County Environmental Health, or until earlier cancellation, pursuant to Commission rules, with written notice thereof by the Department of Environmental Quality to the owners according to Department records or the County Tax records. Subject to the foregoing, this report runs with the land and will automatically benefit subsequent owners.


(Signature of Authorized Agent)

EHS
(Title)

8-2-2007
(Date)

Linn Co. Env. Health
(Office)

Exhibit 14

Page 4 of 6



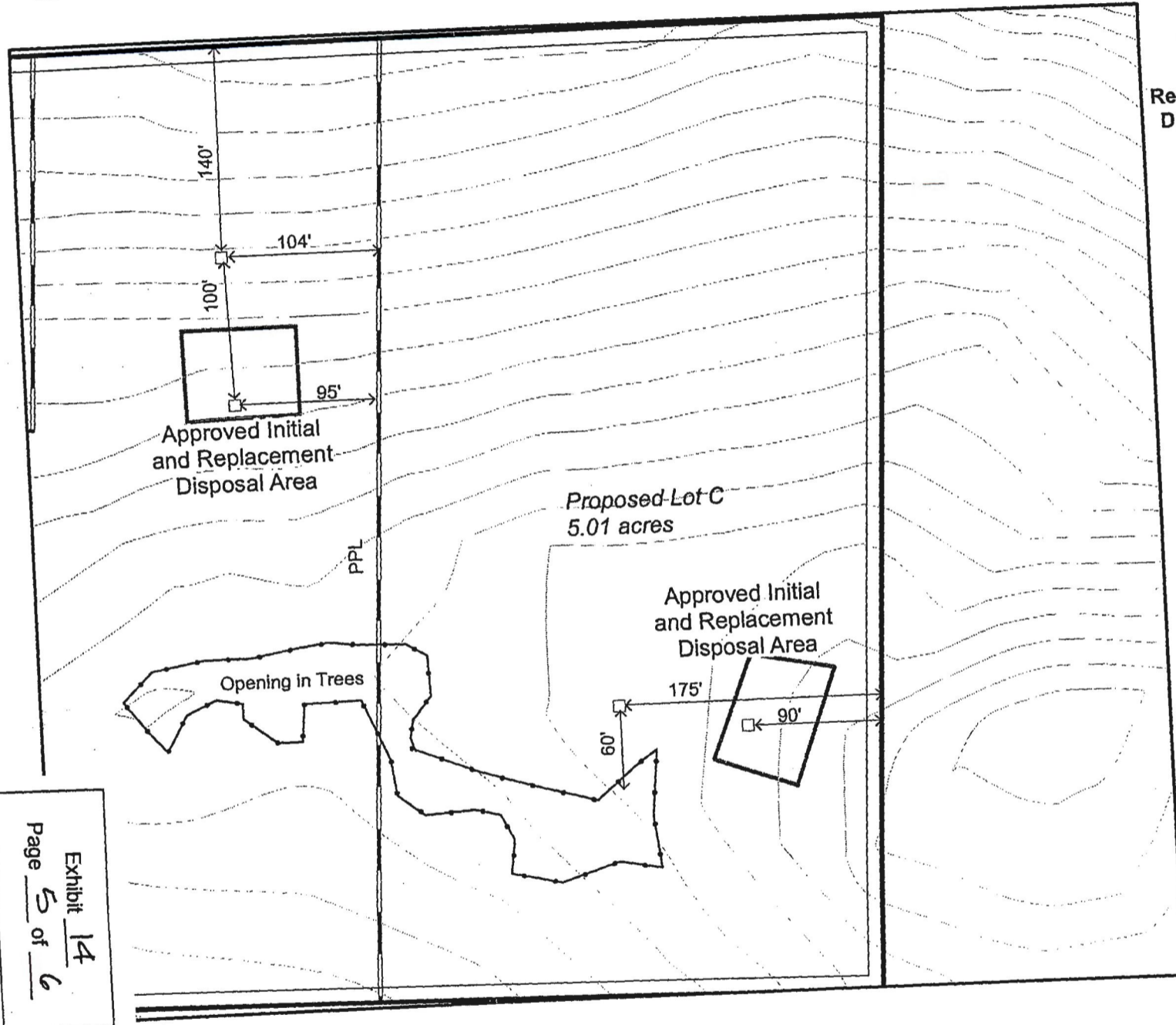
County Courthouse, Room 115
PO Box 100 Albany, OR 97321

Linn County Department of Health Services Environmental Health Program

Fax (541)926-

Site Evaluation Plot Plan

Property ID: 12S01W07 00903
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Exhibit 14
Page 5 of 6

1 inch equals 100 feet



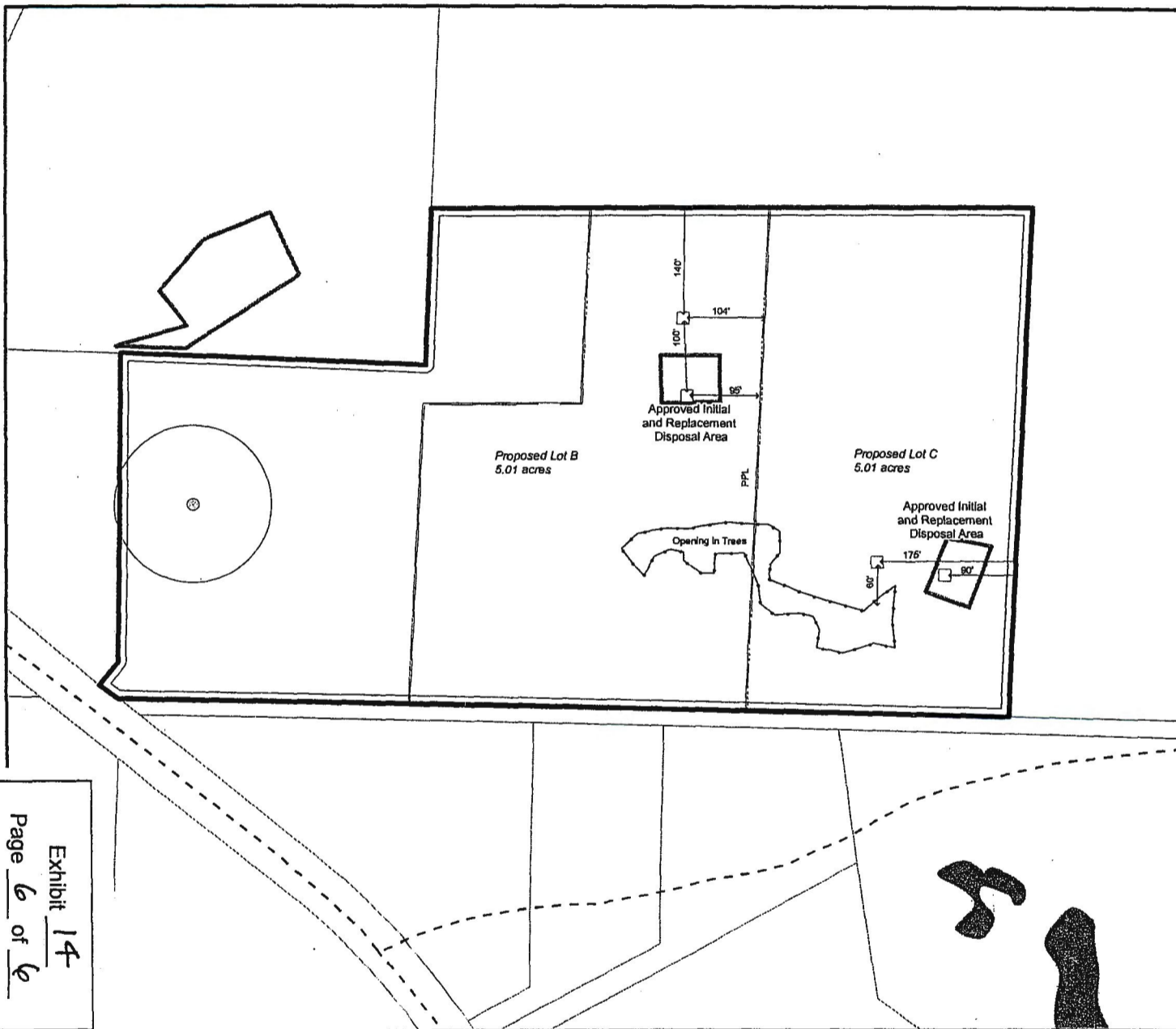
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PO Box 100 Albany, OR 97321

Linn County Department of Health Services Environmental Health Program

Phone: (541) 926-
Fax: (541) 926-

Site Evaluation Plot Plan

Property ID: 12S01W07 00903
Record Number: 30709
Date Produced: 8/2/2007



- ⊗ Wells
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1 inch equals 200 feet

Exhibit 14
Page 6 of 6

Well Logs in the Vicinity of the Cromwell Property
as reported to the Oregon Water Resources Department
Page 1

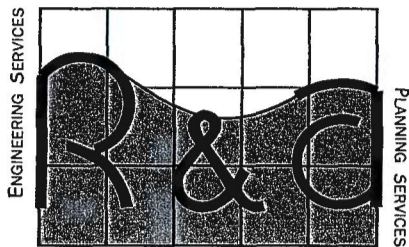
ID	Map	Qtr 160 Ac	Qtr 40 Ac	Tax Lot	Street of Well	Depth First Water	Completed Depth	Static Water Level	Maximum Yield
1	12S1W07	NW	NE			140	150	70	10
3	12S1W07	NW	NE	100	MOUNT HOPE RD		0		
4	12S1W07	SE	NE	1102	GOLDEN VALLEY RD	190	345	40	6
5	12S1W07	SE	NW			230	250	165	15
6	12S1W07	SE	NW	405	38625 GOLDEN VALLEY DR	77	101	61	10
7	12S1W07	SE	NW	405	38625 GOLDEN VALLEY DR	78	160	36	50
8	12S1W07	SE	NW	405	38625 GOLDEN VALLEY DR		0	61	
9	12S1W07	SE	SE			45	60	29	40
10	12S1W07	SE	SW	904		196	205	112	10
11	12S1W07	SW	NE			0	0	0	
12	12S1W07	SW	NE			33	35	7	30
13	12S1W07	SW	NE	412		33	35	7	30
14	12S1W07	SW	NW			0	64	30	55
15	12S1W07	SW	SE			0	255	19	300
16	12S1W07	SW	SE			0	79	28	20
17	12S1W07	SW	SE			0	74	25	20
18	12S1W07	SW	SE			45	50	9	20
19	12S1W07	SW	SW			45	82	29	55
20	12S1W07	SW	SW	300		0	0	17	
21	12S1W07	SW	SW	700	38550 GOLDEN VALLEY DR	99	120	39	60
22	12S1W07	SW	SW	600	38508 GOLDEN VALLEY.	198	218	43	50
23	12S1W07					0	73	37	780
24	12S1W07					0	55	22	40
25	12S1W07					225	245	80	14
26	12S1W07			411	38605 GOLDEN VALLEY RD	179	186	48	
27	12S1W07				GOLDEN VALLEY, LEBANON	140	560	70	
28	12S1W07			1000		149	166	12	70
29	12S1W07			402		151	166	64	30
30	12S1W07					75	105	43	20
31	12S1W07			404		80	206	46	12
32	12S1W07			410	GOLDEN VALLEY RD		402		0
33	12S1W07			410	GOLDEN VALLEY RD	73	102	51	45
34	12S1W18	NE	NE		32160 HIDDEN VALLEY RD		410		0
35	12S1W18	NE	NE	3401	NELSON LANE	106	206	72	3
36	12S1W18	NE	NE	2302	32300 HIDDEN VALLEY RD	98	302	5	2
37	12S1W18	NE	NW			0	200	0	
38	12S1W18	NE	NW	2300	32304 HIDDEN VALLEY RD	265	300	65	6
39	12S1W18	NE	NW	1300	HIDDEN VALLEY RD	120	1005	47	1
40	12S1W18	NE	SE			423	460	10	8
41	12S1W18	NE	SE			77	100	30	20
42	12S1W18	NE	SE			47	70	30	30
43	12S1W18	NE	SE			77	108	30	5
44	12S1W18	NE	SE			45	65	30	40
45	12S1W18	NE	SE			77	105	40	20
46	12S1W18	NE	SE			25	85	25	20
47	12S1W18	NE	SE			25	85	25	10
48	12S1W18	NE	SE	2500	32316 HIDDEN VALLEY	40	82	17	10
49	12S1W18	NE	SE	2300	32300 HIDDEN VALLEY RD	360	520	25	4
50	12S1W18	NE	SW			55	108	7	10
51	12S1W18	NE	SW			0	185	25	10
52	12S1W18	NE	SW			0	145	0	10
53	12S1W18	NE	SW	3900	38684 FIRST CREEK	140	225	100	5
54	12S1W18	NE	SW	4200	38656 FIRST CREEK	65	220	58	9
55	12S1W18	NE	SW	1401	FIRST CREEK	400	740	63	10
56	12S1W18	NE		4100	38692 FIRST CREEK	117	140	58	35
57	12S1W18	NE		4100	38672 FIRST CREEK	117	320	86	6
58	12S1W18	NE		2000	32321 HIDDEN VALLEY RD				
59	12S1W18	NW	NE			135	163	20	8
60	12S1W18	NW	NE	1200	HIDDEN VALLEY RD		602		
61	12S1W18	NW	NE	1200	HIDDEN VALLEY RD		202		
62	12S1W18	NW	NE	1200	HIDDEN VALLEY RD	166	205	99	2
63	12S1W18	NW	NE	1100	BERLIN RD	61	103	54	6
64	12S1W18	NW	NE	200	32510 HIDDEN VALLEY RD		302		
65	12S1W18	NW	NE	200	32510 HIDDEN VALLEY RD	35	122	23	12

Exhibit 15
Page 1 of 2

Well Logs in the Vicinity of the Cromwell Property
as reported to the Oregon Water Resources Department
Page 2

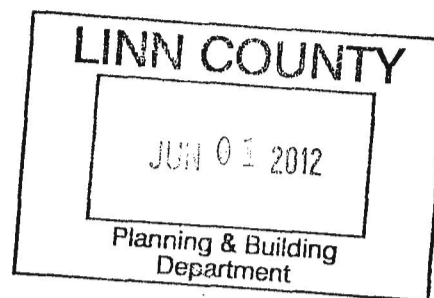
ID	Map	Qtr 160 Ac	Qtr 40 Ac	Tax Lot	Street of Well	Depth First Water	Completed Depth	Static Water Level	Maximum Yield
66	12S1W18	NW	NE	600	32480 HIDDEN VALLEY	135	163	53	5
67	12S1W18	NW	NW			0	176	27	7
68	12S1W18	NW	SE	1202	BUCK HILL LANE		306		
69	12S1W18	NW	SE	1202	BUCK HILL LANE	75	150	52	8
70	12S1W18	SE	NE			0	112	14	5
71	12S1W18	SE	NE		FIRST CREEK RD	33	131	55	13
72	12S1W18	SE	NE	2900	38698 1ST CREEK DR		406	87	1
73	12S1W18	SE	NE	1203	BUCK HILL LANE	40	60	20	35
74	12S1W18	SE	NW	4600	38634 1ST CREEK DR		502		
75	12S1W18	SE	NW	4600	38634 1ST CREEK DR	95	120	58	12
76	12S1W07	NW	NE	100	MOUNT HOPE RD	170	345	140	12
76	12S1W18	SE	NW	801	38624 1ST CREEK DR		461		
77	12S1W18	SE	SE	1100	HIDDEN VALLEY RD	45	147	42	10
78	12S1W18	SE	SE	2400	38671 FIRST CREEK RD	100	190	65	10
79	12S1W18	SE	SE	1106	Approx. 32455 BERLIN RD	22	100	16	9.8
80	12S1W18	SE	SW	600	32455 BERLIN RD	110	165	45	6
81	12S1W18	SE	SW	1111	BERLIN RD, LEBANON	140	340	68	1
82	12S1W18	SW	NE	1216	38600 FIRST CREEK DR	144	182	58	50
83	12S1W18	SW	NW		END OF 1ST AND CREEK LANE	180	205	70	16
84	12S1W18	SW	NW		END OF 1ST CR LN	270	360	70	10
85	12S1W18	SW	SW	4300	FIRST CREEK DR	60	300	38	1
86	12S1W18			100	HIDDEN VALEY	95	125	51	8
87	12S1W18			110	32325 HIDDEN VALLEY RD	211	247	54	6
88	12S1W18			116		68	103	37	15
89	12S1W18			119	32377 HIDDEN VALLEY RD	186	306	29	2
90	12S1W18			604	32455 BERLIN ROAD	221	287	34	4
91	12S1W18			801	38624 FIRST CREEK DR	60	260	36.5	5
92	12S1W18			801	38624 FIRST CREEK	290	400	284	2
93	12S1W18			801	38624 FIRST CREEK DR	370	417	368	1.5
94	12S1W18			801	38624 FIRST CREEK DR		243		0
95	12S1W18			801	38624 FIRST CREEK DR	145	180	85	0.1
96	12S1W18			801	38624 FIRST CREEK DR	200	334	28	3.5
97	12S1W18			801	38624 FIRST CREEK DR	380	440	328	0.5
98	12S1W18			801	38624 FIRST CREEK RD	540	585	303	4
99	12S1W18			1000	32415 BERLIN RD	106	406	14	0
100	12S1W18			1210	32182 HIDDEN VALLEY RD	54	175	11	5
101	12S1W18			1215	HIDDEN VALLEY DR		207	10	70
102	12S1W18			1216	38600 1ST CREEK DR	77	126	34	14
103	12S1W18			2900	1ST CREEK DR		406		
104	12S1W18			4400	FIRST CREEK RD	203	225	30	12
105	12S1W18			4600	38634 1ST CREEK DR	180	206	11	20
106	12S1W18					0	102	50	0
107	12S1W18					0	225	105	8
108	12S1W18					0	345	80	1
109	12S1W18					0	320	0	
110	12S1W18					0	80	34	5
111	12S1W18					42	50	20	35
112	12S1W18					120	410	80	1
113	12S1W18					0	0	0	
114	12S1W18					243	263	82	10
115	12S1W18					35	104	30	10
116	12S1W18					55	80	21	60
117	12S1W18					195	205	80	30
118	12S1W18					35	160	35	12
119	12S1W18				38384 1ST CREEK DR	0	140	73	40
120	12S1W18				1ST CREEK DR	0	145	72	40
121	12S1W18				32356 HIDDEN VALLEY RD	182	204	45	15
122	12S1W18					43	105	16	4
123	12S1W18						425		0
124	12S1W18				38624 FIRST CREEK DR	510	519	497	0.3
125	12S1W18				38624 FIRST CREEK DR	50	320	29	2

Exhibit 15
Page 2 of 2



Reece & Associates, inc.

Deborah Pinkerton
Planning and Building Department
Linn County
PO Box 100
Albany, OR 97321



June 1, 2012

Subject: Response to March 14, 2012 Letter from Katherine Daniels, DLCD

Reference: Linn County File No. BC12-0001
R&A Project No. CRO1001

Dear Ms. Pinkerton:

This letter is provided in response to the letter from Ms. Daniels. In summary, her letter contains factual errors, does not address applicable review criteria, and objects to the current standards of approval.

At the outset, Ms. Daniels incorrectly states that:

“In this case, NRCS data is available to show that the soils are classified as a Hazelair-Dixonville-Philomath complex with a productivity rating of 45 cubic feet per acre per year for the two soils that make up this complex.”

Ms. Daniels has erroneously attributed this productivity rating to NRCS. In fact, NRCS has not published a productivity rating for this soil complex, instead calling out the productivity rating for one component of this soil complex:

“This unit is poorly suited to Douglas-fir. On the basis of a site index of 120 for the Dixonville soil, ...” [Exhibit 12, Pages 12 and 13]

Ms. Daniels perhaps is referring to the Hazelair and Philomath soils, “the two soils that make up this complex”. In fact, NRCS has not published a productivity rating for either 43D – Hazelair silty clay loam or 78C – Philomath silty clay. See attached excerpts from the *Soil Survey of Linn County Area, Oregon* distributed by NRCS.

What then is the source of this productivity rating? It could be that the reference is to Linn County Forest Soils Ratings. [Exhibit 12, Page 24] This was published by Oregon Department of Forestry, not NRCS. In the absence of NRCS data, as is the case here, OAR 660-006-0005(2) and (3) lists approved data sources, namely the January 27, 1989 forest soils ratings submitted to DLCD by ODOF. The rating for the Dixonville-Philomath-Hazelair complex is listed as “est 45”, meaning the rating for this soil complex is estimated to be 45 cf/ac/yr. The ODOF productivity rating is not a fixed value of 45 cf/ac/yr as Ms. Daniels asserts. It could be more, it could be less, because the ratio of soils and the conditions in which this complex has been mapped is highly variable. Given this uncertainty and variability, the only way to accurately determine the productivity rating of land mapped with this soils complex is to measure the actual productivity of trees growing on-site. In this case, direct tree measurements indicate an actual on-site productivity rating of 30 to 33 cf/ac/yr.

Unfortunately, case law has not been as definitive as Ms. Daniels asserts in defining what is forest land. She oversimplifies the review criterion by stating that “soils with a rating of between 40 and 80 should be considered commercial forest land.” In fact, LUBA concluded in *Just v. Linn County* (LUBA No. 2009-068, November 9, 2009) that there is no productivity standard for commercial forest land. As much as Mr. Just insisted there should be a standard, LUBA held that the complex standard of the law could not be reduced to a single number. Correctly stated, soils with a rating of between 40 and 80 may be considered forest land. LUBA concluded:

“Our cases suggest that land with a productivity of less the 20 cf/ac/yr may be unsuitable for commercial forest use unless there are factors that compensate for the land’s relatively low productivity. But land in a middle range from a low of approximately 40 cf/ac/yr to a high of approximately 80 cf/ac/yr is unlikely to be unsuitable for commercial forest use unless there are additional factors that render those moderately productive soils unsuitable for commercial forest use. Rural land with a wood fiber productivity of over 80 cf/ac/yr is almost certainly suitable for commercial forest use, even if there are limiting factors.”

While Ms. Daniels relies heavily on a numeric threshold in support of their conclusion, the language of the rule is not so definitive. LCC 905.930(C) reads in part:

Soils maps can be an initial screening tool used to identify potential non-resource lands, but further study considering all of the resource land definition factors is required as part of an application to change a plan designation.

Reference is made to pages 14 to 19 of the applicant’s Written Statement for a fuller discussion of additional factors that affect the suitability of the subject property for commercial forest use.

Ms. Daniels requests the County to “compare forest cover on the subject site to forest cover for other land in the Hazelair-Dixonville-Philomath complex before making a decision.” This request misses the mark in several respects. First, such a request is not tied to any specific review criteria. She does not explain how such information is needed to support approval of the application. In fact, such information has not been requested in previous Non-Resource proceedings. Second, Ms. Daniels does not explain how to interpret the results of such analysis. The presence of a tree canopy itself is not an indicator of suitability for commercial forest use. It should be noted that while a tree canopy appears in aerial imagery of the applicant’s property, the canopy of comprised mostly of Oregon white oak whose growth is stunted by shallow soils, exposed rock, and wet conditions. Third, the forest cover analysis relies too heavily on the soil classification (and the productivity rating), a position that has already been shown above to ignore additional suitability factors. Finally, whether a property is suitable for commercial forest use is highly dependent on localized factors that are specific to the property itself, not how a property compares to other lands that share one or more characteristics. There is a multiplicity of factors to consider and each factor is weighted in an individualized determination. Soil classification and canopy are only two such factors. This is supported by LCC 905.930(C) which reads in part:

It is not expected that many parcels will meet the criteria to be designated non-resource. Ideally, objective criteria would identify the location of non-resource land. Unfortunately, the identification of non-resource land is based largely on subjective criteria. This means the identification of non-resource lands can only be achieved on a case-by-case basis. Geographic information systems (GIS) mapping can identify parcels that do not have productive farm or forest soils. However, the definition of farm and forestland (previously cited) requires more analysis than just soil types. Soils maps can be an initial screening tool used to identify potential non-resource lands, but further study considering all of the resource land definition factors is required as part of an application to change a plan designation.



Deborah Pinkerton
June 1, 2012
Page 3

In conclusion, Ms. Daniels has not pointed out any flaws in the applicant's submittal. In fact, in a subsequent email exchange, she agreed that the applicant's documentation follows the property methodology in the regulations and case law.

Sincerely,
Reece & Associates, inc.



Rich Catlin

Reece & associates, inc.



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635 Capitol St. NE, Ste. 150
Salem, OR 97301-2540