

but near, the metropolitan area will be used in projects and developments within that area, due to the quality of materials and proximity to development centers on the metropolitan fringes. This includes some of the sites along the lower stretches of the Middle Fork, Coast Fork and McKenzie Rivers. Thus, only a portion of the total supply occurring in each section may actually be used within that section.

Additionally, it is estimated that a small percentage of commercially available aggregate will be purchased by the U.S. Forest Service and the Bureau of Land Management for logging road construction. The Eugene District of the BLM, and the Willamette, Umpqua, and Siuslaw National Forests together estimate that 5 to 10 percent of their aggregate needs will be supplied by the private market, based on consumption patterns over the last five years. This represents an additional amount that will be unavailable for other uses in the future.

**LIMITATIONS OF THE ANALYSIS:** At best, the foregoing projections and analyses are imperfect. The methodology was developed and used to measure supply and demand in the Eugene-Springfield Metropolitan Area. This geographic region is diverse enough to present a reasonably valid statistical model for this method of analysis. In other words, construction activity is sufficiently varied and active enough that single large or unique projects do not distort the findings. This cannot be said for the rural area. Allocating demand on a historical per-capita basis and projecting this into the future only assumes a continuation of past trends. Large projects, such as major highway construction, would obviously increase localized demand beyond projected levels. Another aspect of these projections is that they are generalized over a wide region. Such generalized data does not fully take into account some unique aspects of aggregate resources. These resources are site-specific, non-renewable, self-consuming and, due to weight and bulk, must be near the point of use. While the data presented here has some inherent limitations, it is not without value. The basic conclusions drawn from it are valid. Attempts to apply specific portions of the data to any specific situation must, however, be done in the light of the study and its constraints.

**CONFLICT ANALYSIS:** Goal 5 requires an evaluation of the quality and quantity of all inventoried resources to determine if each site is of sufficient importance to retain in the Plan inventory. If retained, each site must be further evaluated to determine if there are other uses for the property which, if allowed, would conflict with its use for aggregate extraction. From the discussion in the preceding sections of this document, it seems evident that the sites listed in Appendix D are of sufficient importance to be retained.

In general, an evaluation for conflict potential looks to other uses permitted by the zoning district in which the site is located. If one of these uses would conflict with extraction, the consequences of the potential conflict are to be explored. Due to the nature of aggregate extraction and the fact that these are existing sites, a slightly different method was used. Each site was reviewed for conflict with six other uses or identified resource sites as follows:

- A. Areas of significant natural value contained in the

The concepts in these recommendations can be restated and expanded to provide more certain direction. As such, they would provide an adequate Policy base with regard to this topic. Examples of such Policies would be as follows:

- The known mineral resources within the County shall be conserved for present and future use through appropriate land use measures. Known sites shall be designated on Plan Diagrams and zoned in a manner suitable for the needs of the resource and the area. For most mining operation, the Quarry and Mining District (/QM) shall be the preferred zoning application.
- Exploration for mineral resources (in contrast to actual mining) shall be a permitted activity in the rural portions of the County, within specific rural zoning districts.
- Mining operations are regulated by state and federal government agencies. County regulations shall supplement these actions only as necessary to insure compatibility in the area, or to protect other resources.

The above statements should be considered for adoption by the County as Policies concerning mineral resources. County decision-makers are encouraged to develop additional Policies, or revise those presented above, if they so prefer.

## B. Aggregate Resources

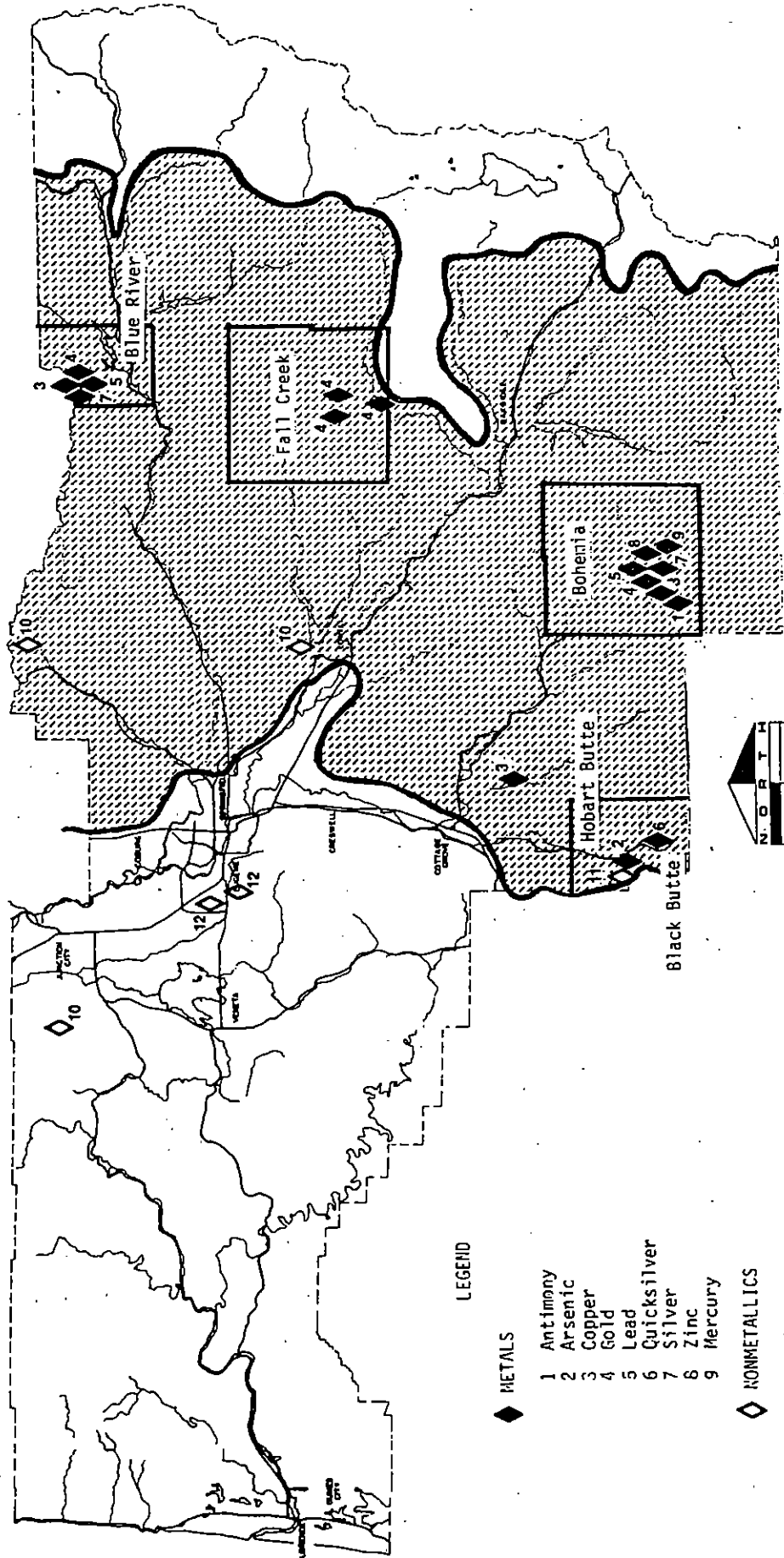
The inventory and analysis of aggregate resources in this Paper are limited to existing locations. The geology of the County is such that it is reasonable to assume additional suitable sites exist. The basic need to have a source of material close to the point of use will undoubtedly cause new sites to be sought out and developed as time goes by. Basic Policy positions are therefore needed for the current situation (existing sites) as well as potential future situations.

With respect to the present, topics to be addressed are:

- How should resource sites be identified in the Plan?
- How can continued utilization of the resource be ensured?

The first question is relatively simple. Operations range from very small and temporary to large and continuous. Only major sites should be designated in the Plan. Minor sites should be given a more generalized treatment through Policy statements. Protection of the resource to ensure continued utilization -- the second question above -- is a more complex issue. The primary means of carrying out land use Policies is through zoning, or land use regulation. To be effective, Policies should be directed toward that end. Currently, the County has two zoning districts that set aside land for the exclusive purpose of aggregate extraction: the S&G District, and the /QM District. The S&G District is intended for extraction of alluvial material (water-deposited sand and gravel), and the /QM District is intended to regulate quarry operations. Extraction is also allowed in many other zoning districts, through conditional use permits. The intent of these two different methods was to zone the major operations,

LANE COUNTY MINERAL DEPOSITS



LEGEND

◆ METALS

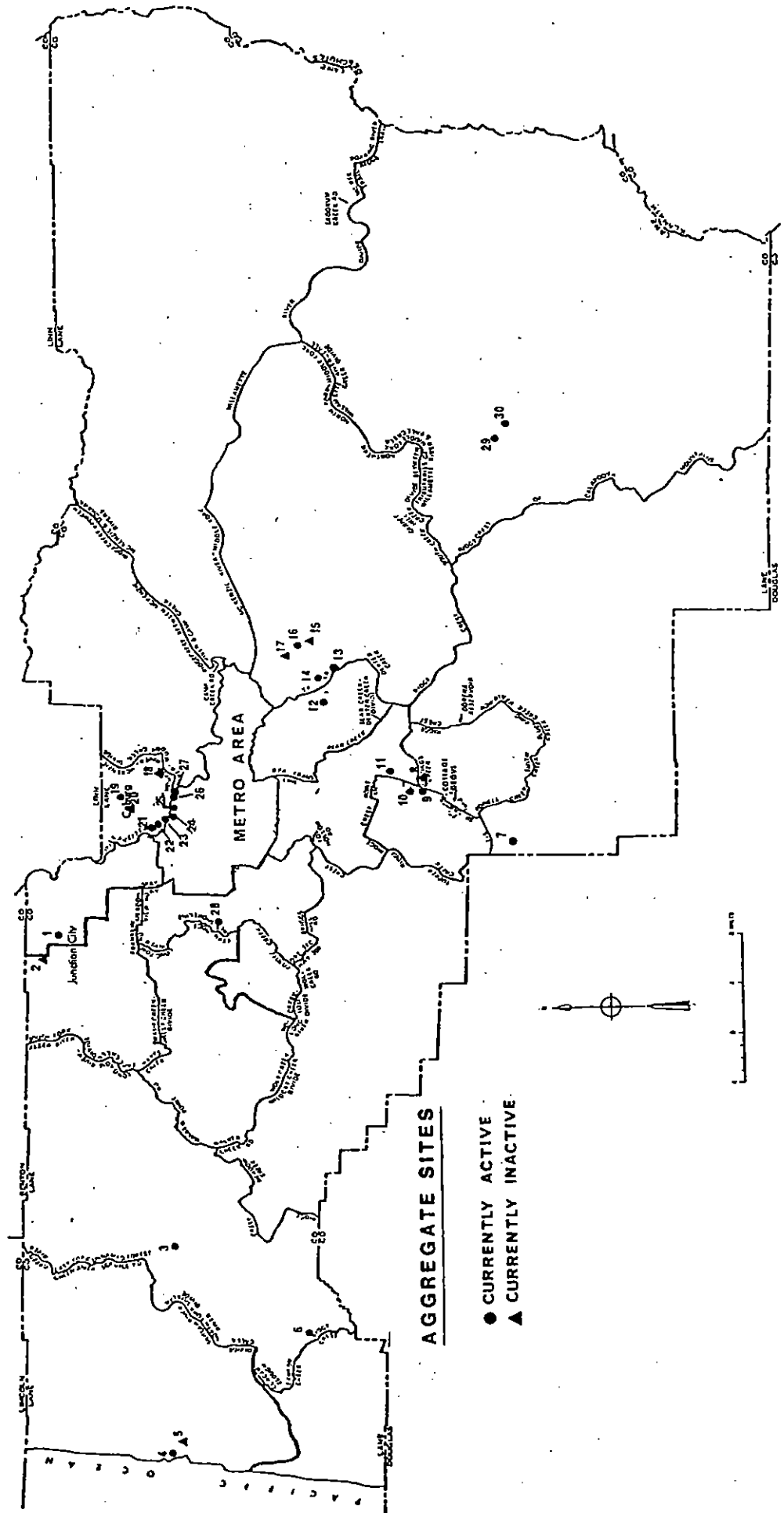
- 1 Antimony
- 2 Arsenic
- 3 Copper
- 4 Gold
- 5 Lead
- 6 Quicksilver
- 7 Silver
- 8 Zinc
- 9 Mercury

◇ NONMETALLICS

- 10 Clay
- 11 Clay (High-alumina)
- 12 Clay and Silica Sand

▨ WESTERN CASCADES

APPENDIX C



APPENDIX E

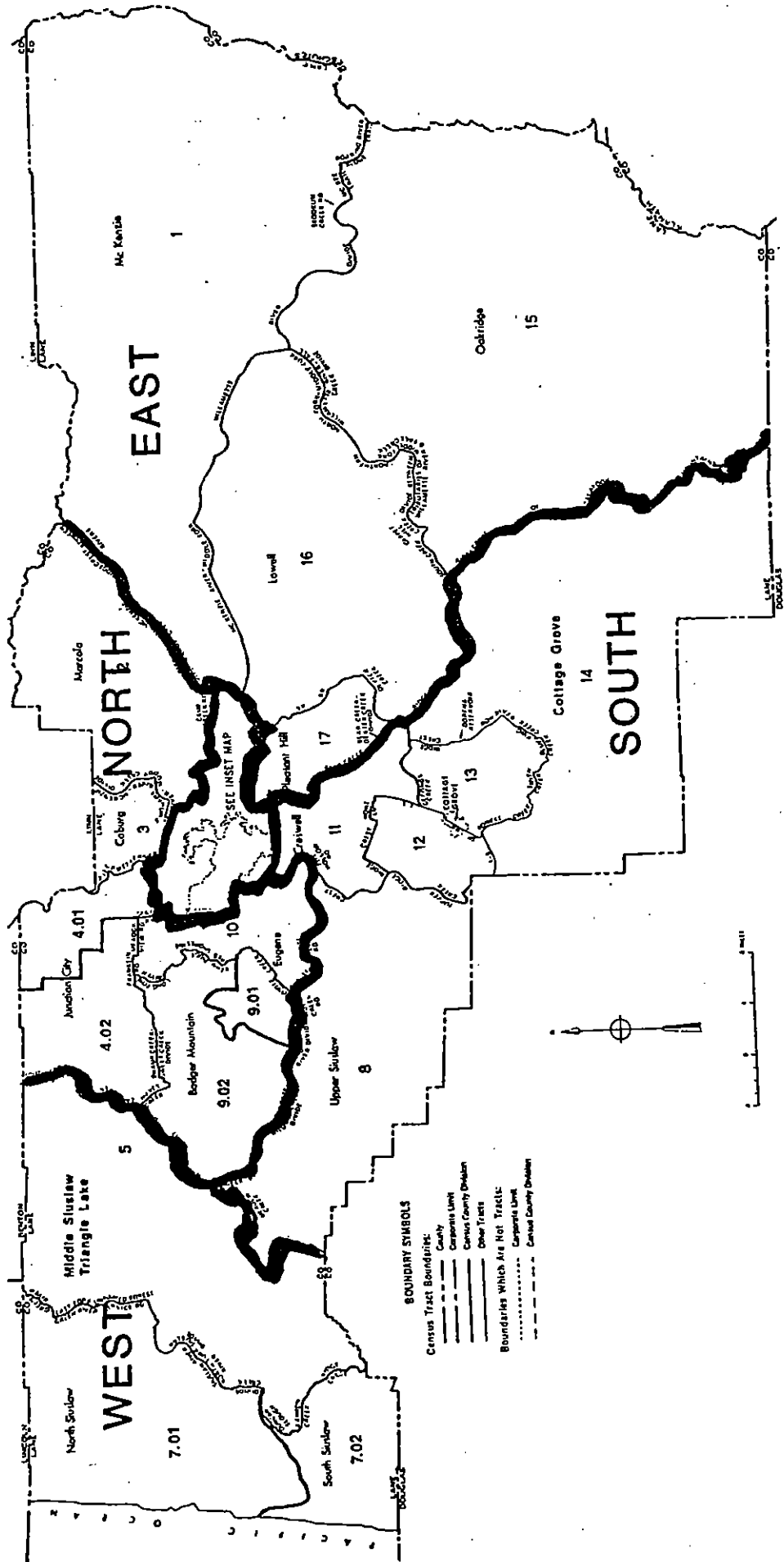
Aggregate Resource Sites in Lane County  
 Inside the Projected Eugene-Springfield Metropolitan Area

MAP #	TAXLOT	UGB	ZONING
160430		X	EFU
170229	00202	X	UZ
170225	00200	X	UZ
170228		X	EFU/SG/M3/RA
170229		X	A2/M3
170230		X	?
170231		X	?
170232		X	M3
170304		X	AGT
170304		X	AGT
170304	00300	X	AGT/EFU
170304	01500	X	AGT
170305	01200	X	SG
170305	01600	X	SG
170306	00600	X	SG
170306		X	SG
170306		X	SG
170307		X	AGT/SG/SGCP
170307		X	AGT/SG/SGCP
170307		X	AGT/SG
170308		X	AGT
170308		X	AGT
170318	01100	X	SGCP
170325		X	?
170328		X	?
170329		X	?
170332		X	?
170333		X	?
170336		X	?
170409		X	?
1704121		X	AGT/SGCP
170413		X	?
170425		X	?
1704273	02101	X	M3
170526		X	FF20
180202		X	?
180203	00300	X	AGT
180205		X	?
180206	01600	X	AGT
180208		X	AGT/SGCP
180219		X	AGT/PR
180301	01100	X	GR10/QM
180302	00600	X	RA
1803022	03200	X	M2
180305+7		X	?
180311	00600	X	SG
180312	00400	X	SG
180404		X	AGT/RA
180405		X	AGT
180525		X	NOT ZONED
180526		X	NOT ZONED

180226		FF20
180527	00300	FF20
180909		FM
181002		?
181011		?
181013		?
181021		FM/EFU/FF20
181112		?
181215		RA/NR
181225		?
190105		FF20
190106	00900	FF20
190108	00100	FF20
190108	03700	FF20
190109		FF20/PR
1901162	03300	FF20
190202	01800	FF20
190312	00701	FF20
190316	01101	FF20
190325	01200	FF20
190335		FF20
190608		FM
190614		FM
191005		FM
191523	00101	FF20
200232		GR10/FF20
200302		FF20/GR10
200303		FF20/GR10/M3
200310		FF20/GR10/M3
200311		FF20/GR10/M2
200313	00500	FF20
200314	00800	FF20
200314	01000	FF20
200315	00102	FF20
200323		AGT5/FF20
200326		FF20/AGT5/RR
2003274	01400	RR
200330	01500	AGT5
200331	01600	?
200334		FF20/RR/AGT
200335		?
200335		?
200336	00100	FF20
200405	00400	FM
210132		?
210135	00100	FF20
210212		FM/PR
210235		FM
210302	00602	?
210302	00601	?
210302	00600	FF20
210304		FF20/RA/RR
210306	00900	FF20
210306	01000	FF20
210316		?
210316		?
210316		?
210322		FM
210333	00200	AGT5
210414		FF20/FM

APPENDIX G

b  
r



APPENDIX I

COMPARISON OF AGGREGATE SUPPLY AND DEMAND BY ANALYSIS AREAS TO YEAR 2000

AREA	SUPPLY (TONS)	1980 DEMAND (TONS)	CUMULATIVE (TONS) DEMAND TO 2000
North Section	84,654,500	706,772	Low Projection: 15,939,440 High Projection: 18,291,240
West Section	15,962,750	275,088	Low Projection: 7,174,200 High Projection: 7,790,640
South Section	15,912,500	525,448	Low Projection: 12,643,840 High Projection: 14,106,840
East Section	34,659,200	447,746	Low Projection: 9,405,440 High Projection: 10,804,200
Non-Metropolitan Lane County Total	151,188,930	1,957,054	Low Projection 45,162,920 High Projection: 50,992,920



- (1) Aggregate site is within same section as an inventoried feature; however not within vicinity of feature. No significant impact or conflict foreseen.
- (2) Aggregate site is within vicinity of inventoried feature; field check indicates no significant conflict.
- (3) Aggregate site is an active operation located just north of Saginaw, approximately 150-400 feet from a reach of the Coast Fork Willamette, which is shown on the Oregon Natural Heritage Program inventory as a significant native riparian wildlife habitat (ONHP site #93). The land containing the habitat is in the same ownership as the extraction pit. The property is within the Willamette Greenway and setbacks established by the Greenway Program are adequate to avoid loss of riparian habitat.
- (4) Aggregate site is an active operation located about two miles downstream from Dexter Dam. Operation is directly across the river from an active Great Blue Heron Rookery identified by the Natural Heritage Program (ONHP site #108). The site is leased from the state. No conflict was noted between the two factors during a field check in 1981, at the present level of activity. The site is also within the Greenway. Because of state ownership, no conflict is anticipated in the future.
- (5) Aggregate site is in the same section as Ferguson Cemetery shown in the County Historical Resources Working Paper's preliminary inventory of historical sites (site C-17). The cemetery was visited and described by D.W. Hayes in late 1980; no significant conflict was found.
- (6) Aggregate site is designated for that use in Lane County Greenway Plan. No conflict expected.
- (7) Aggregate site is on state owned property; land is part of Dexter Dam Park complex. No significant conflict with Park or Greenway.
- (8) Aggregate site is adjacent to McKenzie River, which is designated as an important fish habitat. Excavation is separated from the River by a dike, and hence does not have a significant impact on the habitat.
- (9) Aggregate site is adjacent to the Middle Fork Willamette River, which is designated an important fish habitat. Excavation is separated from the River by a dike, and hence does not have a significant impact on the habitat.
- (10) This is an existing quarry site with a history of conflict with surrounding residences. A determination was made recently by the Lane County Hearings Official that operation of the quarry would not adversely affect the area, and that a change of zoning to the /QM District was appropriate. As of this writing the zone change is under appeal.

LANDS REAL PROP LAND ASSMT DETAIL 6/02/98 9:17:30

ACCT: 823383 1997 ASSESSMENT YEAR COUNTY: LANE

INDEX: F MAP EQ 1902000003500 ACCT X CG X YRA LE 97 LEVY X

ACCT STAT: LONLY, POTAX, DEFFLD, SASSMT, FIRE, SAdj, PAYOR, POST

VOUCHER NUMBER VOUCHER TYPE LAND APPR #

MAP 19 02 00 00-03500 PROF CLASS 640 APPRAISAL DISTRICT 5

DATE LAST ACTIVITY 8-03-97 YEAR DEF YRLA 91 SWA#

YEAR: 97 ACRES 40.00 TAX VAL 2,880 COPR VAL

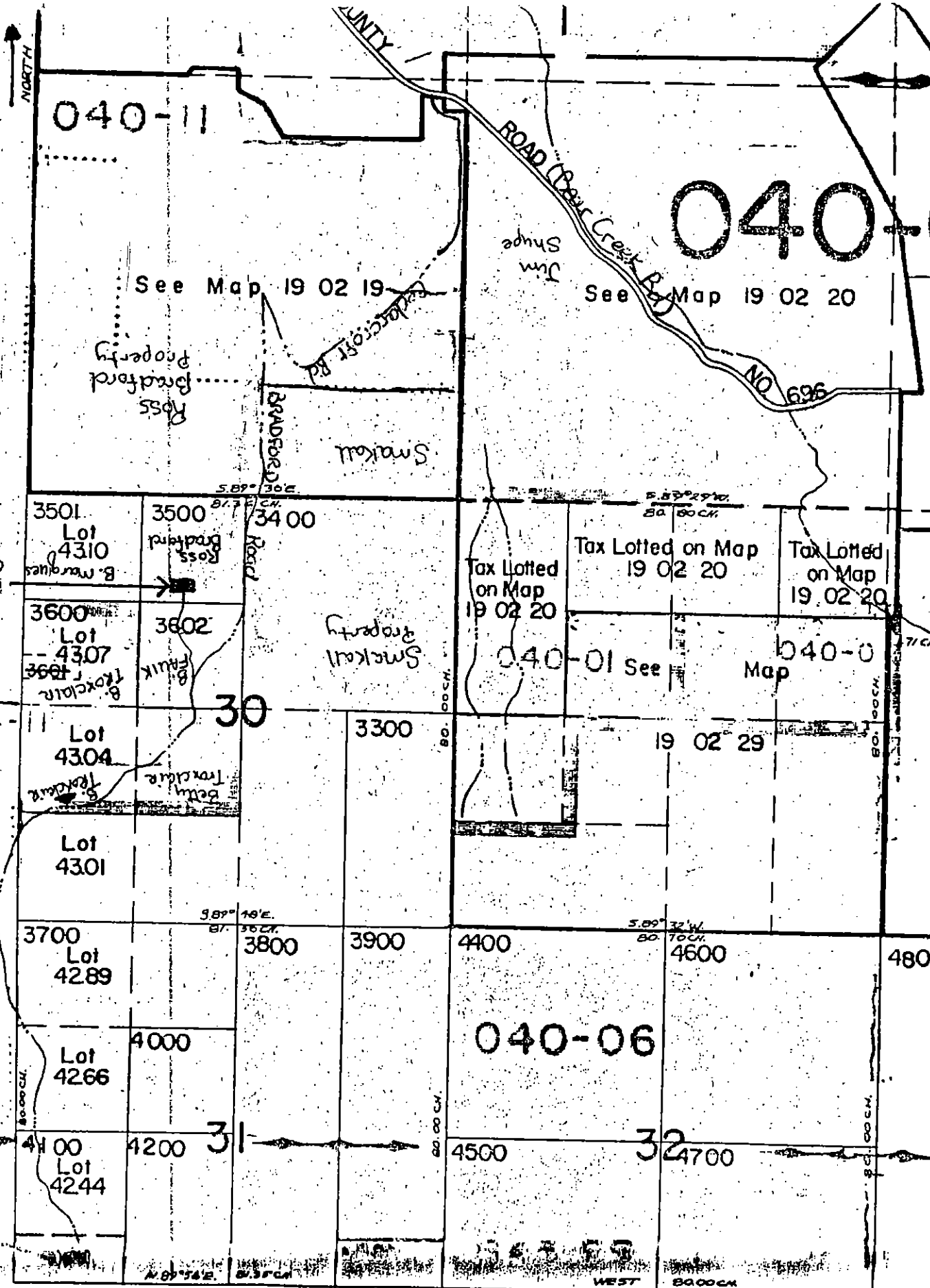
CODE: 40-06 ACRES 40.00 TAX VAL 2,880 COPR VAL

RMV VAL 64,490 RMV ADJ % 100

RES NEIGH 503R2 COM NEIGH

CLASS	PROP CLS	ACRES	VAL/ACR	VALUE	COPR VALUE	DEF	ZON	REFR
ZONE	ADJ %							
FI		40.00		FORESTLAND			FRM	
A	100	72.00		2,880		1	0	0

See Map 19 C



Existing Quarry

BLM

Chris Meyers

040-11

040

See Map 19 02 19

See Map 19 02 20

3501 Lot 4310 B. Marquis

3500 Ross Bradford

3400

3600 Lot 4307 B. T. Clark

3602 B. Frank

Snakall Property

Tax Lotted on Map 19 02 20

Tax Lotted on Map 19 02 20

Tax Lotted on Map 19 02 20

040-01 See Map

040-0 Map

Lot 4304

3300

19 02 29

Lot 4301

3700 Lot 4289

3800

3900

4400

4600

4801

040-06

Lot 4266

4000

4100 Lot 4244

4200

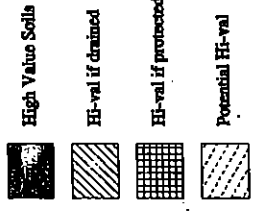
4500

4700

SOIL MAP UNITS IN ACRES  
FOR MAP 19020000 LOT 3500

MAP UNIT	AREA IN ACRES	PERCENT	SOIL NAME	COMPONENT NAME	AGRICULTURAL CAPABILITY CLASS
9D	1.126	4.055	NEKIA SILTY CLAY LOAM, 12 TO 20 PERCENT SLOPES	NEKIA	3
9F	0.669	2.407	NEKIA SILTY CLAY LOAM, 30 TO 50 PERCENT SLOPES	NEKIA	6
12E	7.954	28.633	BELLPINE COBBLY SILTY CLAY LOAM, 2 TO 30 PERCENT SLOPES	BELLPINE	4
11F	10.474	37.703	BELLPINE SILTY CLAY LOAM, 30 TO 50 PERCENT SLOPES	BELLPINE	6
38E	6.213	22.364	WITZEL VERY COBBLY LOAM, 3 TO 30 PERCENT SLOPES	WITZEL	6
38G	1.344	4.838	WITZEL VERY COBBLY LOAM, 30 TO 75 PERCENT SLOPES	WITZEL	6

19020000 lot 3500



Scale 1:4800

Produced by  
Lane Council of Governments



TIMBER MANAGEMENT PLAN

COPY

Landowner: Ross Bradford

Legal Description: T.19S, R.2W, Sec. 19, 20 & 30

Acres: Total 256 Timber 229

Date: August 22, 1984

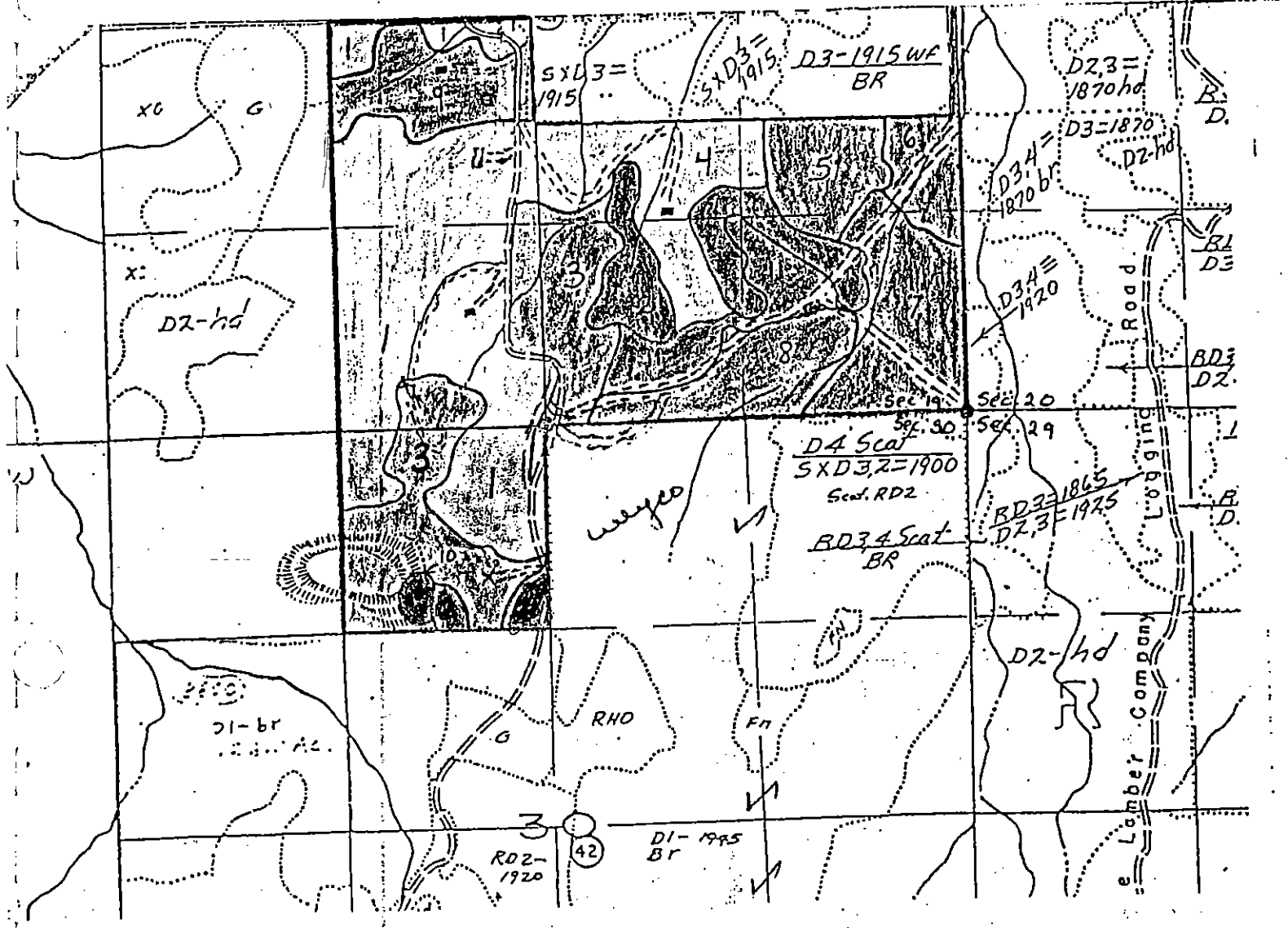
Landowner Objectives: To reforest underproducing land and commercially thin  
overstocked areas.

USING THIS MANAGEMENT PLAN

The property included in this plan has been examined to identify various cover types, stand conditions, problems, and potentials. Each homogeneous "cover type" has been located on a map and the data for each type presented on the page(s) entitled "EXAMINATION REPORT & RECOMMENDATIONS". The management recommendations are prioritized and target dates for each operation are provided to aid you in scheduling your program. Further information on specific management operations is provided in the appendices.

10  
3  
2  
1

ROSS BRADFORD  
T.19S, R.2W, Sec. 19&30



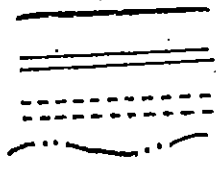
Area 1 Nekiia class III  
 Area 2 Bellpine class III  
 Area 3 class III + IV  
 Area 10 Rocky Site no growth potential

#7-1984-16a  
 #5-1985-12a

FOREST COVER TYPE MAP

LEGEND

- Property Line
- Road (improved)
- Road (unimproved)
- Stream



Scale bar with markings for 0, 100, and 200 feet.

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 1

Description: This is the largest continuous forest type found on the property.  
Douglas-fir ranging from 10"-16" in diameter and some scattered pockets of hard-  
woods comprise this forest type. Some white fir can also be found.

Acreage: 75 Age: 40-45

Stocking: medium

Growth Potential: Douglas-fir site class III (Nekia soil)

Problems: Limited access is available at this time for most of the area.

Management Recommendations: Commercially thin the stand removing poorer  
quality conifers and hardwoods. In some instances, harvest older residual seed  
trees left from previous logging. This will release the understory stand.  
Douglas-fir should be favored over White fir. (Note appendix for guidelines on  
commercial thinning.)

Priority: Medium Target Dates: 1985-1990

Constraints/Special Considerations: Due to rocky soils and limited top  
soil, harvest material in dry weather to help reduce erosion and compaction.



EXT NATION REPORT & RECOMMENDATIONS

Cover Type 2

Description: This is a well to overstocked stand of Douglas-fir ranging from 8" to 12" in diameter.

Acreage: 20 Age: 40-45

Stocking: Well stocked.

Growth Potential: Douglas-fir site class III (Bellpine soil)

Problems: ---

Management Recommendations: Commercially thin stand removing poorer quality conifers. Care should be taken not to overthin type as wind damage could occur after harvest.

Priority: High Target Dates: 1985

Constraints/Special Considerations: Harvest in dry weather due to shallow rocky soils.

EXPLANATION REPORT & RECOMMENDATIONS

Cover Type 3

Description: Hardwoods dominate this site. In the southwest portion of property,  
maple, alder, residual Douglas-fir 24"-30" in diameter and occasional white fir  
24-30" in diameter dominate this type. Alder, 3"-8" in diameter, comprise the  
other portion of the type.

Acreage: 40 Age: 50+

Stocking: Poor for Douglas-fir

Growth Potential: Douglas-fir site class III and IV

Problems: Southwest portion of type 3 is on a ridge top and is extremely  
rocky. Deer browsing could be problem on new plantations.

Management Recommendations: Clear-cut area, prepare site by burning slash  
and replant to Douglas-fir or a species adapted to a drier site. (Some areas  
can't be reforested due to rocky conditions) These areas could be harvested in  
conjunction with the management of type 1.

*Progress - 1986 - some thinning along road & hardwood*

Priority: Medium Target Dates: 1985-1990

Constraints/Special Considerations: A drainage system should be established  
in that portion of this type near the main access road. Once site is logged,  
slashed and the drainage system developed, this area could become productive

~~Comments: This site is a portion of the ...~~

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 4

Description: Scattered Douglas-fir, maple, alder, white fir, and brush pockets  
constitute this forest type. Douglas-fir ranges from 12"-22" in diameter with  
alder being 8" to 12".

Acreage: 24 Age: 40-50

Stocking: Poor to medium for fir, depending upon site.

Growth Potential: Douglas-fir site class III

Problems: Ridge tops are very rocky. Deer browsing will be a problem when  
establishing new plantations.

Management Recommendations: Clear cut more productive sites and replant  
to Douglas-fir. Wetter areas should be drained if feasible and replanted to  
Douglas-fir or a species more adapted to wetter conditions.

No Progress - (1) Cleared 1985 (2) Planted 1986 of 1521R  
Progress (1) Some Hardwood removed 1985, 86 & some thinning.

Priority: Medium Target Dates: ---

Constraints/Special Considerations: Drainage system development in this  
type should consider problems that exist in type 3. Reforestation of rocky  
ridge on northern boundary of property will be difficult.

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 5

Description: Brush and Douglas-fir reproduction make up this forest type. Area was logged some time back and is overgrown with brush species.

Acreage: 13 Age: 10-15

Stocking: Poor to medium for Douglas-fir

Growth Potential: Douglas-fir site class III

Problems: Severe competition from brush species. Newly planted seedlings may be damaged by deer browsing.

Management Recommendations: Spray brush in late fall or spring to kill competing vegetation. Poorly stocked portions of type should be interplanted with 2-1 Douglas-fir seedlings.

Program ① Site Prep 1985 (Includes small portion #6) ② Planted + BJR 1986 76 acres 7560 trees 12

Priority: High Target Dates: 1985

Program - 1985 Site Prep  
Planted, 1986

Constraints/Special Considerations: Property line should be established before spraying area.

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 6

Description: Ash, oak and pockets of brush are located in this type.

Acreage: 7 Age: 50+

Stocking: Poor for Douglas-fir

Growth Potential: No site class for fir due to wet soil conditions

Problems: Wet site and poor soil type will make this area difficult to reforest. Browsing from deer or elk could be a problem.

Management Recommendations: Continue cutting hardwood for either saw logs or firewood. Area should be replanted to either ash, cottonwood or a species adapted to wetter sites.

*Progress (1) some drainage completed 1984 & 85 & 86 (2) small portion at N. end drained & planted 1986*

Priority: low Target Dates: ----

Constraints/Special Considerations: A drainage system in this area would help divert the water and dry out the site.

TERMINATION REPORT & RECOMMENDATIONS

Cover Type 7

Description: This type was harvested some years ago and now contains some  
hardwoods, scattered Douglas-fir and ponderosa pine reproductions plus brush.  
Hardwoods are currently being harvested.

Acreage: 23 Age: -----

Stocking: Poor for fir and pine.

Growth Potential: No Douglas-fir site class due to poor soils.

Problems: A dry site and deer or elk browsing will cause reforestation  
problems.

Management Recommendations: Lightly scarify site during dry weather, re-  
moving brush and hardwoods. Natural shading elements such as stumps or logs  
should remain. Replant area to Douglas-fir and ponderosa pine and protect  
trees from animal damage. Shade cards should also be beneficial.

Priority: High Target Dates: 1984 & 1985

*Plan - 1984*

*Planted 1-26-85*

Constraints/Special Considerations: Establish a central drainage channel  
for area which will help dry-up site below the access road.

*Progress - over  
(Completed)  
1985*

EXPLANATION REPORT & RECOMMENDATIONS

Cover Type 8

Description: Douglas-fir ranging from 3"-14" in diameter comprise this site.  
Hardwoods are found in the wetter portions. Brush pockets are scattered through-  
out the area.

Acreage: 15 Age: 15-25

Stocking: Medium

Growth Potential: Douglas-fir site class III-V

Problems: Some areas are very wet.

Management Recommendations: Some areas may need precommercially thinned in  
the near future. Brush pockets could be scarified and replanted to Douglas-fir.  
Retain wetter sites in hardwoods.

(Progress) (1) ACP acceptance 7-29-86 (2) ACP extension  
to Mar 1, 87

Priority: low Target Dates: ---

Constraints/Special Considerations: Construction of a drainage system  
might also help dry up the wetter portions of this type.

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 9

Description: This is the homesite, shop and fields used for grazing.

Acreage: 14 Age: ---

Stocking: -----

Growth Potential: Douglas-fir site class III-V

Problems: ---

Management Recommendations: Continue current use. Fields could be  
planted if grazing were discontinued.

Priority: --- Target Dates: ----

Constraints/Special Considerations: ---



EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 10

Description: This is a cleared area consisting of rock.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Acreage: 1 Age: ----

Stocking: ----

Growth Potential: Rocky site. No growth potential.

Problems: \_\_\_\_\_  
\_\_\_\_\_

Management Recommendations: Landowner is considering the development  
of a rock quarry.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Priority: --- Target Dates: ---

Constraints/Special Considerations: The surrounding stand of timber should  
be considered in the development plans for the quarry.  
\_\_\_\_\_  
\_\_\_\_\_

EXAMINATION REPORT & RECOMMENDATIONS

Cover Type 11

Description: This area has been cleared of hardwoods and fir. Currently grass brush and some small hardwoods are found in the area. The eastern part of this type was partial cut leaving some small fir.

Acreage: 14 Age: ----

Stocking: Poor for Douglas-fir

Growth Potential: Douglas-fir site class III & V

Problems: Some of site is very wet.

Management Recommendations: Establish a drainage system for wetter area. Scarify site removing all merchantable material, pile material and burn. Replant drier sites to Douglas-fir. Cottonwood could be planted in wetter area.

*Progress* ① Some Drainage Completed 1985

Priority: Medium Target Dates: 1985 & 1986

Constraints/Special Considerations: \_\_\_\_\_



**TRAFFIC IMPACT ANALYSIS  
FOR  
PROPOSED BRADFORD PIT QUARRY**

**June, 1998**

**Prepared for:**

**B.J. EQUIPMENT COMPANY  
P.O. Box 543  
Cottage Grove, OR 97424**

**Prepared by:**

**BRANCH ENGINEERING  
310 Fifth Street  
Springfield, Oregon 97477  
Phone (541) 746-0637  
FAX (541) 746-0389**

" I "

TRAFFIC IMPACT ANALYSIS  
FOR  
PROPOSED BRADFORD PIT QUARRY

June, 1998



Prepared by:

BRANCH ENGINEERING  
310 Fifth Street  
Springfield, Oregon 97477

## Table of Contents

INTRODUCTION .....	1
EXISTING CONDITIONS .....	1
Roadway System .....	1
Existing Traffic Volumes .....	2
FUTURE TRAFFIC VOLUMES .....	2
LEVEL OF SERVICE .....	2
SIGHT DISTANCE EVALUATION .....	4
ROADWAY STRUCTURAL ANALYSIS .....	4
CONCLUSIONS AND RECOMMENDATIONS .....	5

## List of Figures

Figure 1	Vicinity Map
Figure 2	1998 Existing Traffic Volumes
Figure 3	Site Generated Traffic Volumes
Figure 4	1998 'Build' Traffic Volumes
Figure 5	Core Sample Locations

## Appendices

Level of Service Calculations
Core Sample Analysis

## **INTRODUCTION**

The purpose of this report is to document the traffic impact analysis performed for the proposed Bradford Pit Quarry near Creswell, Oregon. The study addresses the existing traffic conditions in the project vicinity and forecasts the operating conditions of the roadway system during operation of the quarry. This report also summarizes results of a structural analysis performed for roadways on the travel route and recommends any improvements necessary to mitigate impacts to the existing transportation system.

Access to the Bradford Pit Quarry is proposed via a private road extending from the end of Cedarcroft Road, east of Creswell, as shown in Figure 1. Proposed development consists of a quarry and rock crushing operation on approximately 40 acres of previously logged and quarry mined land.

The proposed quarry and rock crushing facilities are expected to be complete by 1999 and have a service life of approximately 20 years. Quarry mining and rock crushing operations will be conducted between the hours of 7:00AM and 5:00PM Monday through Friday.

## **EXISTING CONDITIONS**

### **Roadway System**

Cloverdale Road is a county arterial roadway providing connection between Creswell and Pleasant Hill. The roadway is 32 feet wide in the project vicinity and has a posted speed of 55 MPH.

Bear Creek Road is a county roadway extending east from Cloverdale Road. The roadway is 24 feet wide in the project vicinity and has a posted speed of 50 MPH. The roadway has been used by the timber industry as a haul road for many years.

Cedarcroft Road is a rural county roadway extending south from Bear Creek Road. The roadway has a paved width of 24 feet for approximately 750 feet, followed by a 22 foot wide gravel surface. There is currently no traffic control at the intersection of Cedarcroft Road with Bear Creek Road, and no lane striping on the roadway. Cedarcroft Road was originally constructed for the hauling of timber and rock from the area surrounding the project site.

### **Existing Traffic Volumes**

Existing peak hour traffic volumes were determined from a traffic count performed at the intersection of Bear Creek Road with Cloverdale Road. The count was conducted by Branch Engineering in June, 1998 from 4:30 to 5:30 PM. The count hour was selected to analyze the highest Cloverdale Road and Bear Creek Road traffic volumes during the quarry's hours of operation. The 1998 existing traffic volumes are shown in Figure 2.

### **FUTURE TRAFFIC VOLUMES**

Bradford Pit Quarry is projected to generate a maximum of 86 trips per day based on maximum production capacity of the quarry and rock crushing facilities. The trip generation calculations used in this analysis are summarized below:

Maximum rock production: 100,000 cubic yards per year  
100,000 cubic yards per year / 250 work days per year = 400 cubic yards per day  
400 cubic yards per day / 10 cubic yards per truck = 40 trucks  
On-site employees: 3  
Total trips = number of vehicles (43) x (2) = 86 trips per day

Dividing the number of truck trips throughout the 10 hours of operation and adding on-site employees leaving the site equates to eleven trips in the PM peak hour, four entering and seven exiting.

A conservative approach was used in this analysis to project the maximum number of trips generated by the site. The actual number of trips per day is expected to be less than 86, as trucks with haul capacities greater than 10 cubic yards will be used in transporting rock from the quarry.

The site generated trips were distributed equally north and south on Cloverdale Road to estimate future conditions. Actual travel patterns will depend on the locations of construction projects throughout the southern Willamette Valley. The site generated traffic is shown in Figure 3 and the 1998 'Build' traffic (1998 existing traffic plus site generated traffic) is shown in Figure 4.

### **LEVEL OF SERVICE**

Level of service (LOS) describes the quality of traffic flow at an intersection. It can be based on either vehicle delay or the volume to capacity ratio, and is classified by a letter scale from 'A' to 'F'. LOS 'A' represents optimum operating conditions and minimum delay. LOS 'F' indicates over capacity conditions causing unacceptable delay. LOS 'D' is considered the minimum acceptable level of service. Roadway or intersection improvements are often necessary when the level of service is below 'D'. The level of service determined by average delay per vehicle as



established in the Highway Capacity Manual is as follows:

<u>Level of Service</u>	<u>Average Delay per Vehicle Unsignalized Intersections</u>
A	≤ 5 sec
B	> 5 and ≤ 10 sec
C	> 10 and ≤ 20 sec
D	> 20 and ≤ 30 sec
E	> 30 and ≤ 45 sec
F	> 45 sec

A level of service analysis was performed for the PM peak hour at the Bear Creek Road/Cloverdale Road and Cedarcroft Road/Bear Creek Road intersections. Levels of service at these intersections were calculated using the computer program Highway Capacity Software (HCS) developed by McTrans. For unsignalized intersections, a level of service is reported only for movements which have to yield the right-of-way.

The following table indicates the projected levels of service at the studied intersections:

<b>LEVEL OF SERVICE (PM Peak Hour)</b>		
<b>Intersection</b>	<b>1998 Existing</b>	<b>1998 'Build'</b>
Bear Creek Road/Cloverdale Road		
Westbound Left Turn	A	A
Westbound Right Turn	A	A
Southbound Left Turn	A	A
Cedarcroft Road/Bear Creek Road		
Northbound Left Turn	A	A
Northbound Right Turn	A	A
Westbound Left Turn	A	A

The level of service analysis indicates all movements at the studied intersections are projected to operate at LOS 'A' with the proposed development and the additional trips generated by the development are not expected to have significant adverse impact on the roadway system.

## SIGHT DISTANCE EVALUATION

The Bear Creek Road/Cloverdale Road and Cedarcroft Road/Bear Creek Road intersections were evaluated to determine if the existing sight distances are adequate to serve trucks entering the roadways. Site distances measured in the field were compared to the minimum stopping sight distance recommended by the American Association of State Highway and Transportation Official's manual, A Policy on Geometric Design of Highways and Street, 1990. The results of this evaluation are shown in the following table:

<b>STOPPING SIGHT DISTANCE EVALUATION</b>		
<b>Intersection/Movement</b>	<b>Measured Distance</b>	<b>Recommended Distance</b>
Bear Creek Road/Cloverdale Road Westbound Left Turn Westbound Right Turn	940 ft unrestricted	550 ft 550 ft
Cedarcroft Road/Bear Creek Road Northbound Left Turn Northbound Right Turn	580 ft 680 ft	550 ft 550 ft

The site distance evaluation indicates the intersections are expected to operate safely with large trucks entering the existing roadways. Adequate distance is provided for vehicles on Bear Creek Road and Cloverdale Road to slow or stop as necessary allowing trucks to accelerate to travel speeds.

## ROADWAY STRUCTURAL ANALYSIS

The roadway structure on Bear Creek Road and Cedarcroft Road was analyzed to ensure adequate strength is provided to support the number of loaded haul trucks generated by the proposed quarry. Asphalt core samples were taken at four locations along the travel route, two on Bear Creek Road, and two on Cedarcroft Road as shown in Figure 5. Professional Service Industries (PSI) extracted the samples and conducted the core analysis, providing data on thickness, specific gravity, density, and percent compaction of the existing pavement structure. A summary of this data is provided in the table on the following page.

Field tests also included exploration of the base rock beneath the existing asphalt paving. The base rock thickness was determined at each of the core sample locations and is listed in the table below. Base rock at each location was found to be well compacted 1 ½"-0 aggregate.

<b>CORE SAMPLE SUMMARY</b>					
<b>Sample No.</b>	<b>Base Rock Thickness</b>	<b>AC Thickness</b>	<b>Bulk Specific Gravity</b>	<b>Density (PCF)</b>	<b>Percent Compaction</b>
1	16"	2.47"	2.22	138.2	90.3
2	18"	2.02"	2.24	139.4	91.2
3	12"	3.48"	2.23	138.8	90.7
4	14"	2.63"	2.18	135.7	88.4

The pavement surfaces on Bear Creek Road and Cedarcroft Road were examined during field visits to identify any defects in the pavement structure. Both roadways were found to be in good condition and no significant grooves or cracks were noted.

Bear Creek Road and Cedarcroft Road are under Lane County Jurisdiction and inventoried in the County's Pavement Management System. The County will review the core sample data, indicate the extent of impact to the roadway structure, and determine if mitigation of these impacts is necessary.

Scales will be installed at the quarry site to ensure trucks leaving the quarry meet legal weight requirements.

### **CONCLUSIONS AND RECOMMENDATIONS**

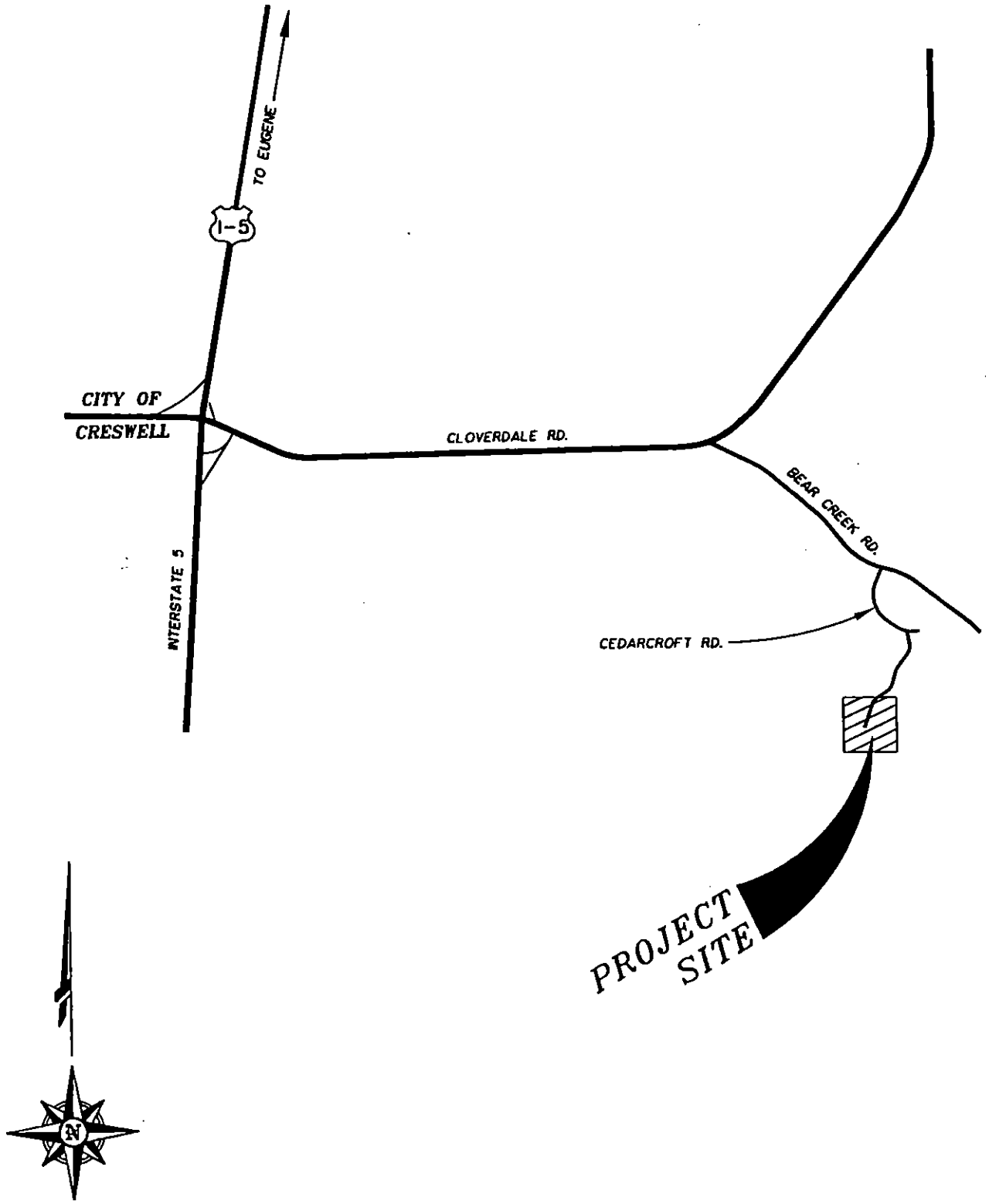
The proposed quarry and rock crushing operation is projected to generate a maximum of 86 trips per day and 11 trips during the PM peak hour. This report indicates the additional trips are not expected to have significant adverse impact on the operating characteristics of existing roadways and intersections. The Bear Creek Road/Cloverdale Road and Cedarcroft Road/Bear Creek Road intersections were found to have adequate sight distance for vehicles to slow or stop as necessary for trucks entering the roadway.

In order to minimize the risk of accidents at the studied intersections, it is recommended a stop sign be placed at the Cedarcroft Road/Bear Creek Road intersection. It is also recommended vegetation along Bear Creek Road, particularly east of the Cedarcroft Road intersection be regularly cut back as far as possible to provide the greatest available sight distance for vehicles approaching from the east.

Bear Creek Road and Cedarcroft Road have been used as timber and rock haul roads for many years. Sight distances, grades, and radii of curvature on these roadways were found to be suitable for large trucks. The proposed project could be beneficial to the overall roadway system as construction projects in the Creswell vicinity are anticipated in the coming years. Availability of rock from a location near future construction projects would reduce the number of miles in the overall roadway system traveled by rock haul vehicles.

**Figures**

# VICINITY MAP



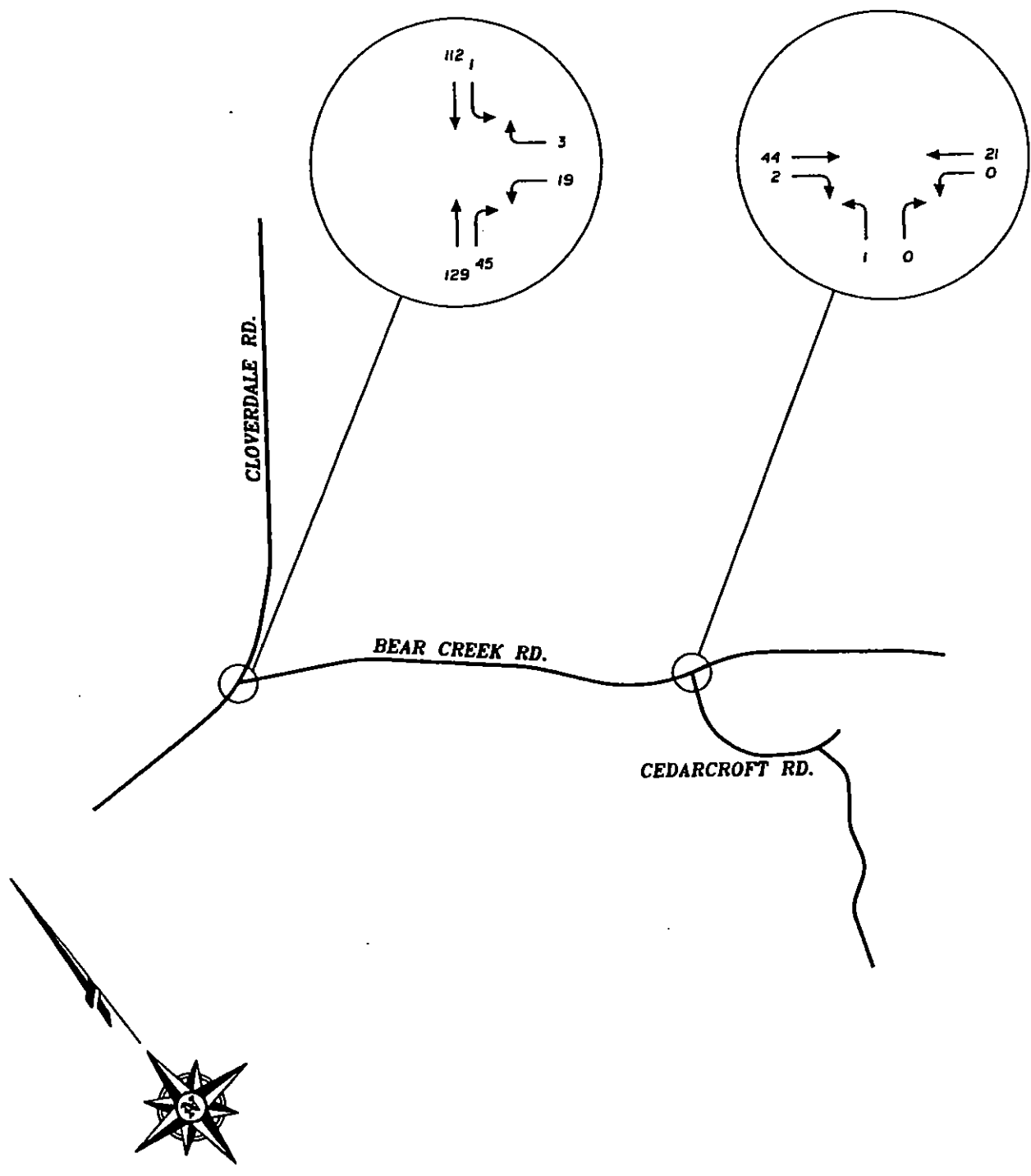
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FIGURE 1



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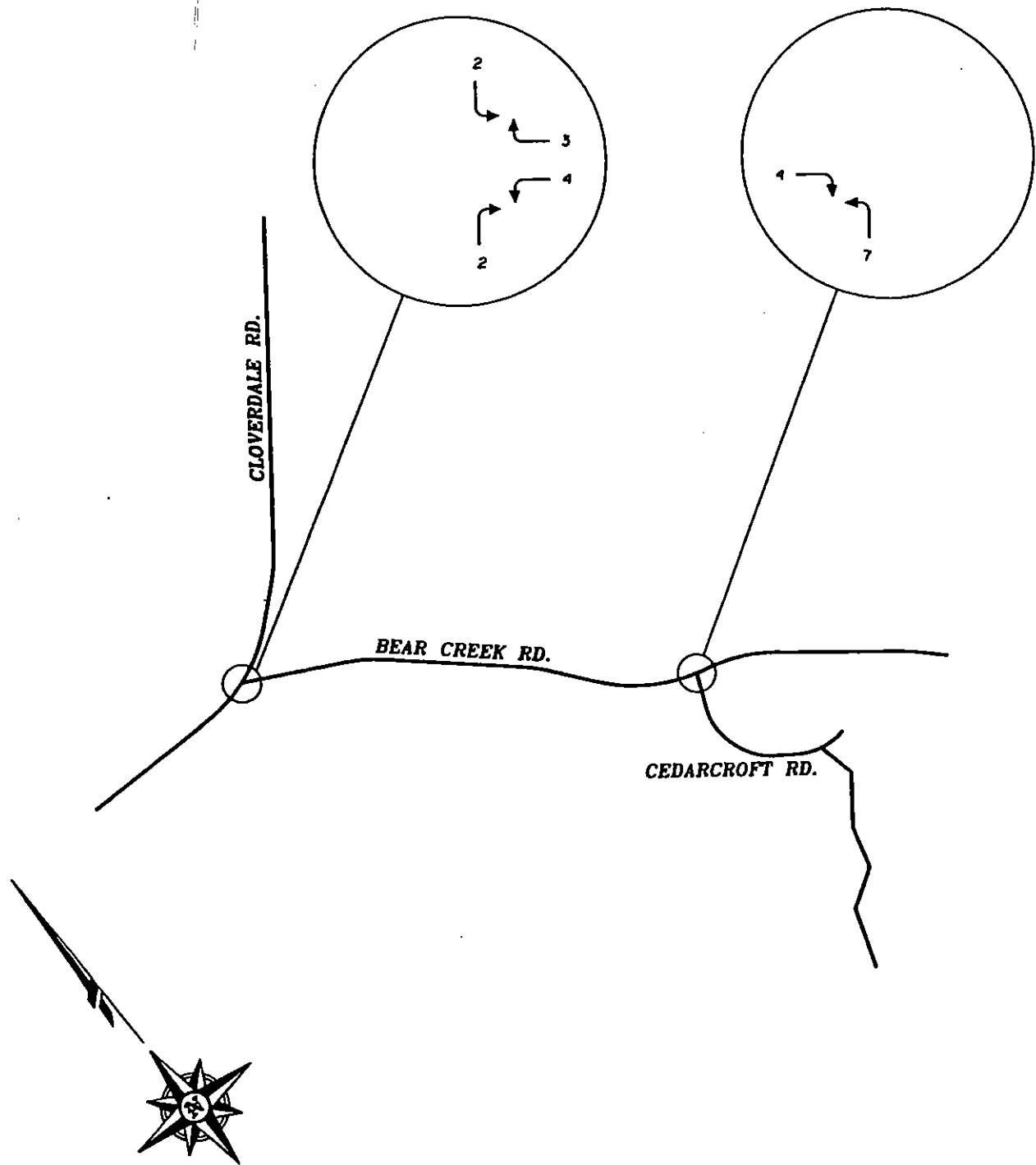
# 1998 EXISTING TRAFFIC VOLUMES (PM PEAK HOUR)



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FIGURE 2

# SITE GENERATED TRAFFIC VOLUMES (PM PEAK HOUR)



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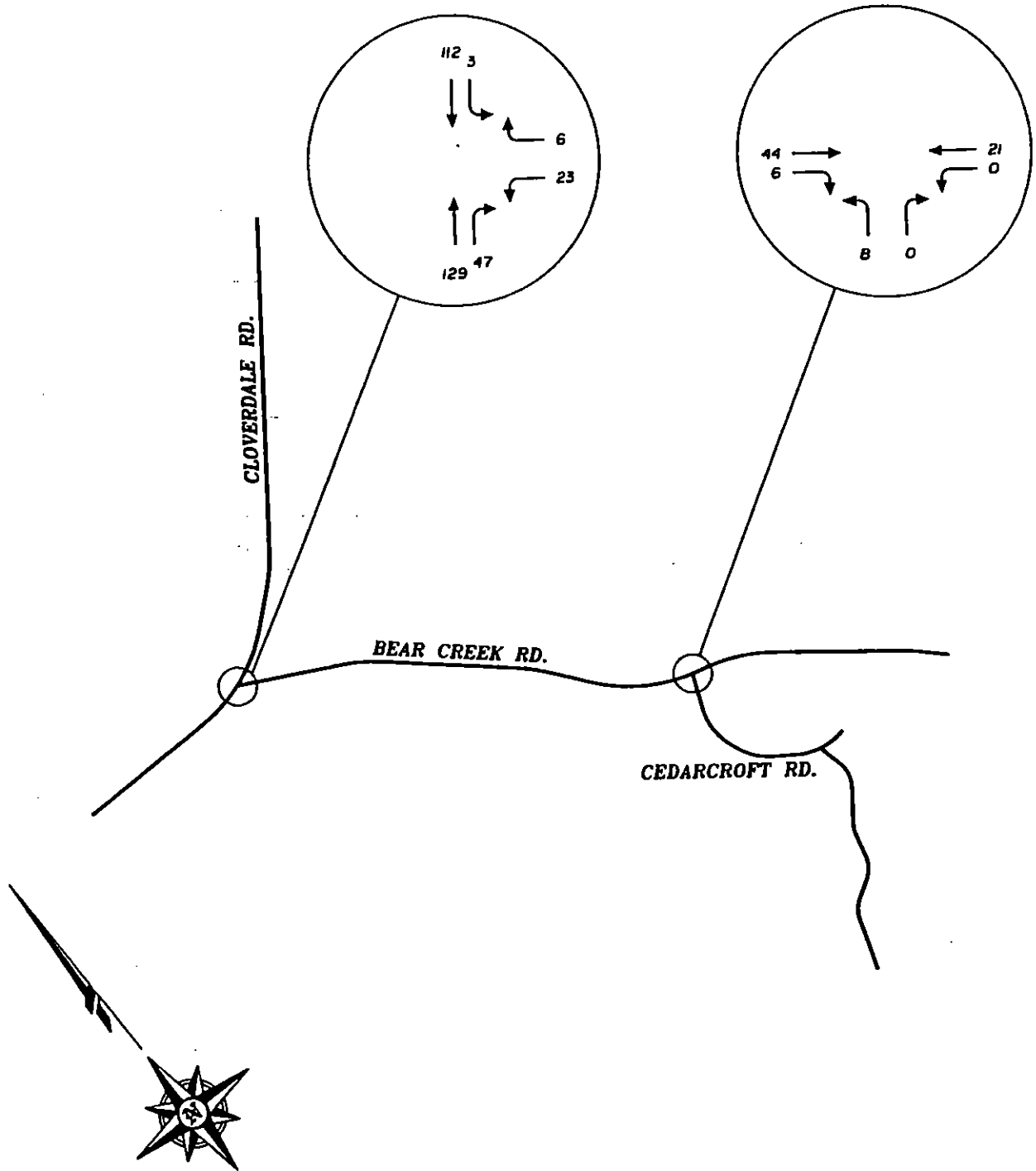
FIGURE 3



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# 1998 'BUILD' TRAFFIC VOLUMES (PM PEAK HOUR)



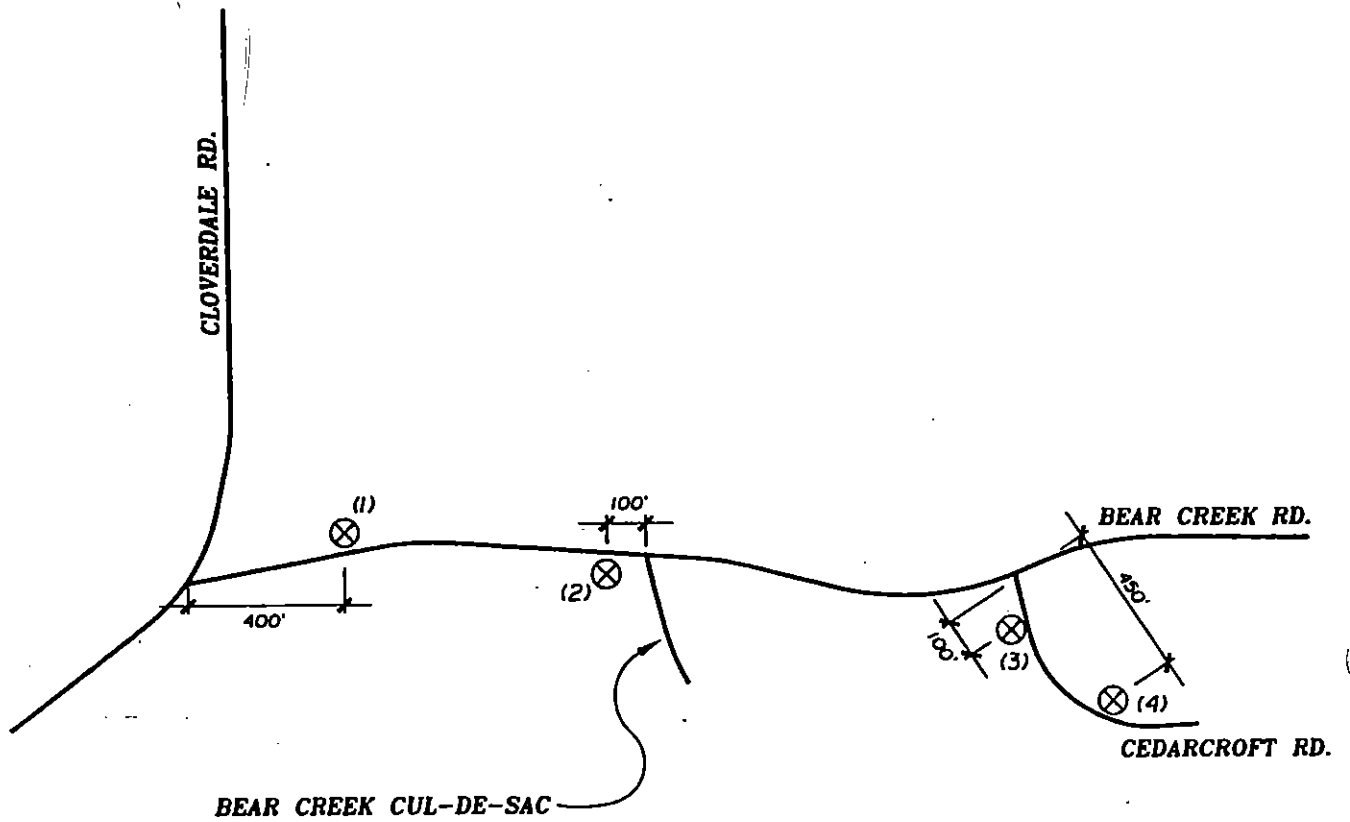
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FIGURE 4

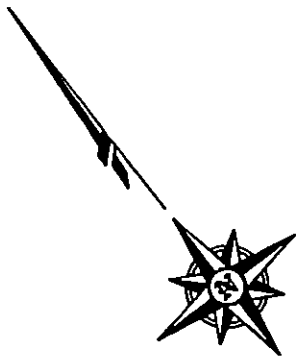


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# CORE SAMPLE LOCATIONS



⊗ CORE SAMPLES TAKEN BETWEEN  
WHEEL TRACKS ON SIDE OF  
ROADWAY AS SHOWN ABOVE



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FIGURE 5



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# Appendices

Intersection Performance Summary

Movement	FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB L	29	739 >	802	> 4.7	> A	4.7
WB R	8	1160 >		>	>	
SB L	3	1413		2.6	A	0.1

Intersection Delay = 0.5

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File Name .....  
 Streets: (N-S) Cedarcroft Rd (E-W) Bear Creek Rd  
 Major Street Direction.... EW  
 Length of Time Analyzed... 60 (min)  
 Analyst..... Chilson  
 Date of Analysis..... 6/22/98  
 Other Information..... 1998 Existing Traffic Volumes

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0>	0<	0	0	0	0
Stop/Yield			N			N			0			
Volumes		44	2	0	21		1		0			
PHF		.9	.9	.9	.9		.9		.9			
Grade		0			0			0			0	
MC's (%)		0	0	0	0		0		0			
SU/RV's (%)		0	0	0	0		0		0			
CV's (%)		2	0	0	0		0		0			
PCE's		1.1	1.1	1.1	1.1		1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	45	
Potential Capacity: (pcph)	1314	
Movement Capacity: (pcph)	1314	
Prob. of Queue-free State:	1.00	
Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	46	
Potential Capacity: (pcph)	1630	
Movement Capacity: (pcph)	1630	
Prob. of Queue-free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-free State:	1.00	
Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	66	
Potential Capacity: (pcph)	970	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	970	

Intersection Performance Summary

Movement	FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
NB L	1	970	> 970	> 3.7	> A	

Intersection Delay = 0.1

Center For Microcomputers In Transportation

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File Name .....  
 Streets: (N-S) Cedarcroft Rd (E-W) Bear Creek Rd  
 Major Street Direction.... EW  
 Length of Time Analyzed... 60 (min)  
 Analyst..... Chilson  
 Date of Analysis..... 6/22/98  
 Other Information..... 1998 'Build' Traffic Volumes

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0>	0<	0	0	0	0
Stop/Yield			N			N						
Volumes		44	6	0	21		8		0			
PHF		.9	.9	.9	.9		.9		.9			
Grade		0			0			0			0	
MC's (%)		0	0	0	0		0		0			
SU/RV's (%)		0	0	0	0		0		0			
CV's (%)		2	0	0	0		0		0			
PCE's		1.1	1.1	1.1	1.1		1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40





Intersection Performance Summary

Movement	FlowRate v (pcph)	MoveCap Cm (pcph)	SharedCap Csh (pcph)	Avg.Total Delay	LOS	Delay By App
NB L	10	967	> 967	> 3.8	> A	

Intersection Delay = 0.4