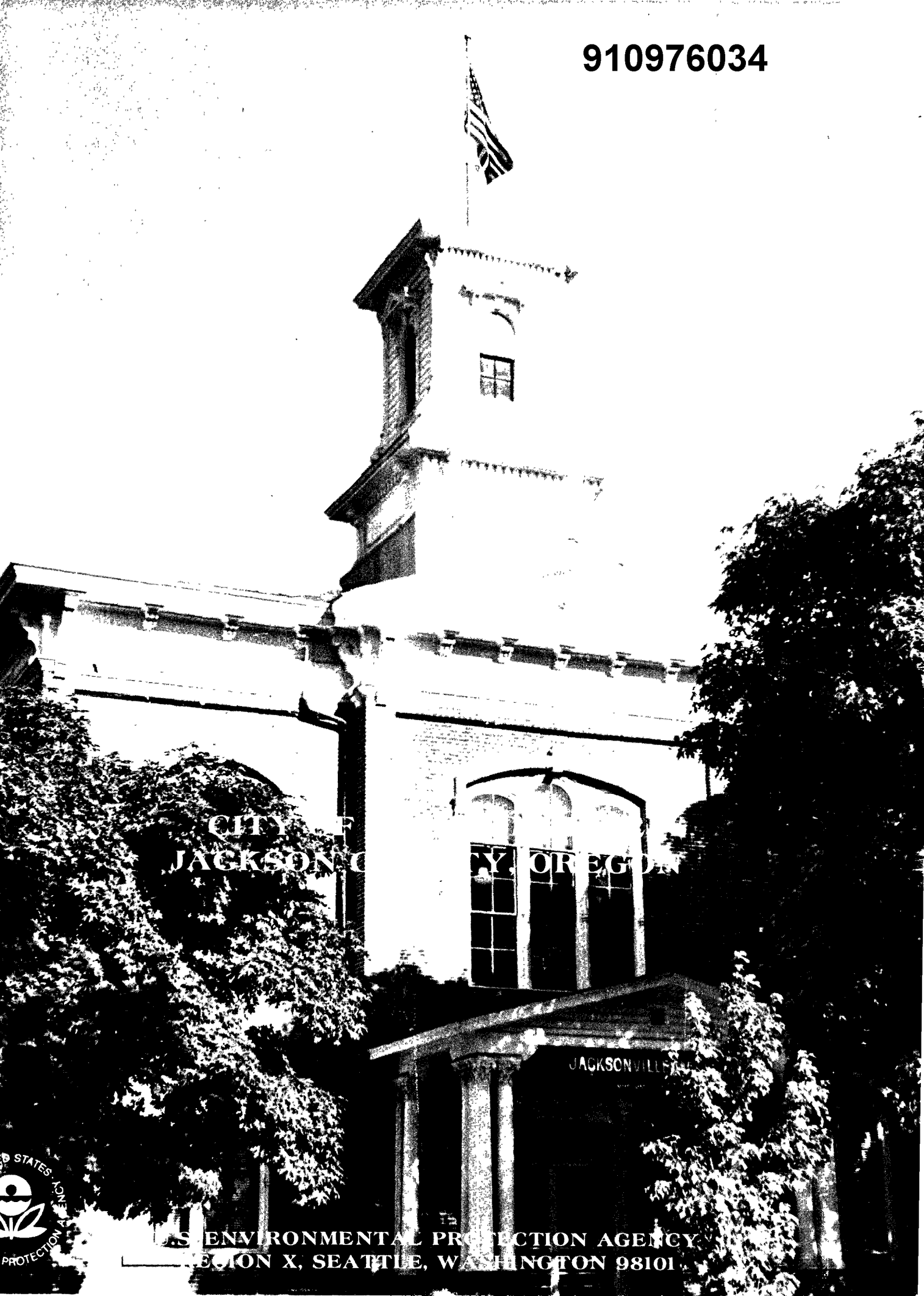
910976034



CITY OF
JACKSON COUNTY, OREGON

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X, SEATTLE, WASHINGTON 98101

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR

CITY OF JACKSONVILLE
JACKSON COUNTY, OREGON

EPA-10-OR-JACKSON-JACKSONVILLE-WWTW-76

Prepared By
U.S. Environmental Protection Agency
Region X
Seattle, Washington 98101

With Technical Assistance By
Jones & Stokes Associates, Inc.
2321 P Street
Sacramento, California 95816

RESPONSIBLE OFFICIAL:

Donald P. Dubois
Regional Administrator

December 6, 1976
Date

ADDENDUM

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR

CITY OF JACKSONVILLE
JACKSON COUNTY, OREGON

EPA-10-OR-JACKSON-JACKSONVILLE-WWTW-76

Prepared By
U.S. Environmental Protection Agency
Region X
Seattle, Washington 98101

With Technical Assistance By
Jones & Stokes Associates, Inc.
2321 P Street
Sacramento, California 95816

February 8, 1977
Date

ADDENDUM TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
CITY OF JACKSONVILLE, JACKSON COUNTY, OREGON
DECEMBER 1976

Introduction

This addendum to the Draft Environmental Impact Statement (EIS) (December 1976) for the City of Jacksonville, Oregon, wastewater treatment system amends the Draft EIS by presenting: 1) an additional facilities alternative (A-3); 2) a cost for A-3; and 3) recomputations of costs for Alternatives A-1 and A-2. Also included is an environmental impact evaluation of Alternative A-3. This added and revised material will be included in the Final EIS along with other revisions that respond to comments on the Draft EIS. This addendum is being distributed to those persons who have received a Draft EIS and will be available at the public hearing to be held on February 17, 1977 in Jacksonville.

Description of Alternative A-3 - Bear Creek Valley Sanitary Authority (BCVSA) Annexation with Limited Service Area

Alternative A-3 is comparable to Alternatives A-1 and A-2 except that the sewerage service area was reduced to include only: 1) the present City of Jacksonville (1,274 acres); 2) the proposed Jacksonville urban growth areas (328 acres); and 3) a 152-acre corridor of land between Pioneer Avenue and the existing Jacksonville sewage lagoons. This corridor is defined as a 300-foot setback from the interceptor plus existing developments. The City of Jacksonville would extend its interceptor, which presently terminates at the sewage lagoons, to connect to the headworks of the existing 30-inch West Medford trunk operated by BCVSA. The West Medford trunk presently terminates at Pioneer Avenue. BCVSA would participate in this extension. The existing sewage lagoon site would be drained, regraded and sold.

The extension of the Jacksonville interceptor from the sewage lagoons to Pioneer Avenue will require 7,200 feet of 15-inch pipe. The probable alignment of the extension and the service area are shown on Figure 12a. The main difference between Alternative A-1 and A-3 interceptors is in pipeline size and thus, long-term service capacities.

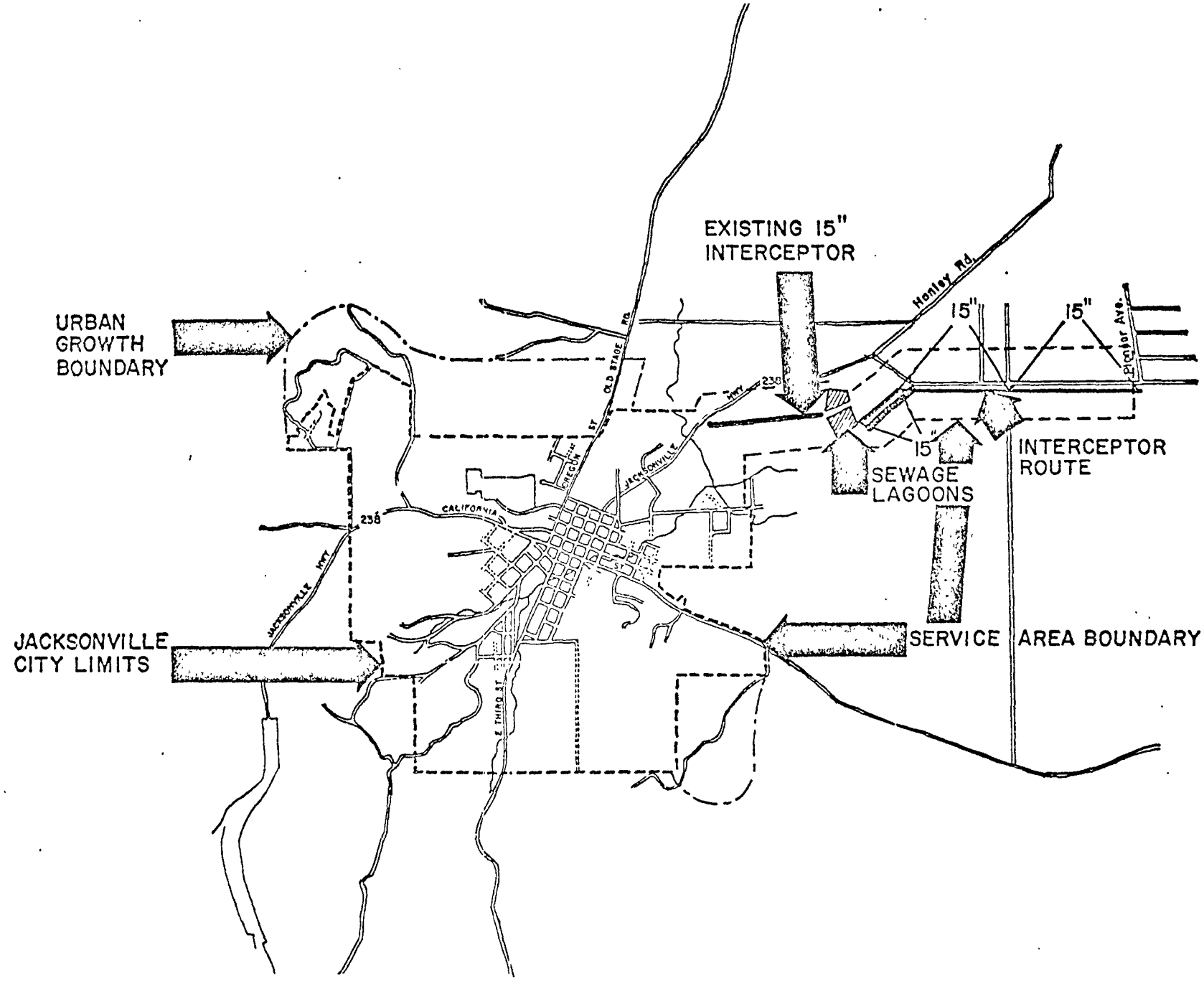


FIGURE 12A SERVICE AREA AND ROUTING OF INTERCEPTORS FOR ALTERNATIVE A-3

This 15-inch pipeline could convey 2.7 mgd (4.2 cfs), while the expected wastewater flow will be 1.46 mgd (2.3 cfs). It will serve the projected 1997 Jacksonville population of 5,300 plus a projected population of 561 in the corridor between Pioneer Avenue and the existing Jacksonville sewage ponds.

The population in the corridor area is estimated to be 371. This estimate was made by counting houses in a 1975 aerial photograph of the area (scale 1" = 500') and by comparing this count with the existing zoning map which shows platted property along the Jacksonville Highway. The house count (109 dwellings) was multiplied by 3.4 (BCATS data, 1974) to derive the present population estimate.

The projected 1997 population of 561 persons in the corridor was determined by assuming: 1) that present F-5 and RR-5 (5-acre minimum) zoning would be maintained; 2) total infilling and buildout would occur in the corridor by 1997; 3) a minimum lot frontage of 300 feet (as required under Jackson County ordinance for 5-acre zoning); 4) lots less than 5 acres in size platted prior to ordinance would be developed as they were platted and not as 5-acre minimums; 5) 15 trailers would be added to the trailer park at the corner of Hanley Road and Jackson Highway; and 6) the same 3.4 factor applied (Jackson County zoning map, BCATS data, 1974; aerial photo, 1975; Nelson, pers. comm.). The projected population was calculated using these assumptions by adding 190 to the present population of 371 for a total of 561.

The population sizing and capacity of this alternative is smaller than that recommended to Jacksonville by BCVSA (January 26, 1977) which estimated a 1997 population of 1,050 people for the corridor area. Based on the BCVSA criteria (i.e., a wastewater flow of 100 gallons per capita per day [gpd]), a peaking factor of 2.5 and an infiltration-inflow rate of 200 pcd, the Jacksonville population plus the corridor population of 1,050 would produce a total flow of 4.3 cfs (2.8 mgd). BCVSA recommended pipeline segment sizes of 15, 18 and 21 inches from Jacksonville to Pioneer Avenue. This pipeline capacity of 2.8 mgd (4.3 cfs) could serve a population of nearly 11,200 people, which is already covered by Alternatives A-1 and A-2 in the Draft EIS. Based on population projections for the City of Jacksonville, and in the corridor between Jacksonville and Pioneer Avenue (5,861 persons), the BCVSA capacity is judged to be greater

than the projected needs of the City of Jacksonville and the corridor, thus providing a principal reason for describing Alternative A-3. T. Flatebo & Associates, sanitary engineer to Jacksonville, judged that sufficient sizing could be achieved by assuming a wastewater flow of 80 gallons per capita per day, an infiltration-inflow of 50 gpcd and a peaking factor of 2.5. These assumptions were used to develop the proposed 15-inch size.

However, the proposed 15-inch interceptor could service a population of approximately 10,800 which is also greater than the expected 20-year need for Jacksonville and the 300-foot setback corridor. The rationale for 15 inches relates to the fact that the projected 1.46 mgd flow is at the upper capacity limit for a 12-inch pipe; thus to achieve a safety factor and accommodation of growth beyond 20 years, 15 inches is proposed. Detailed design engineering may not determine the long-term sizing needed because of uncertainties about land use in the area.

Issues relating to interceptor pipeline sizing will probably have to be resolved before a federal grant is awarded.

The estimated capital cost of implementing Alternative A-3, assuming construction begins in 1977, is estimated to be $491,200, and the average annual operation/maintenance costs are $77,900 (see Table 13A). These costs were developed for the pipeline sizes suggested by BCVSA. Reduction in pipe size to 15 inches would not significantly change the cost estimate. Under this alternative, the City of Jacksonville would annex into the BCVSA for sewerage services based on a contractual agreement. The details of such a contract have not been determined at this time.

Table 13A

Alternative A-3
Bear Creek Valley Sanitary Authority Annexation
With Minimum Service Area

Item	Cost Dollars[1,2]	Life, Years	Salvage Value, Dollars[2]
Capacity purchase in Bear Creek interceptor	102,000	50	61,200
West Medford Trunk extension	379,200[3,4]	50	227,500
Abandonment of existing treatment facility	10,000	--	42,500
Total construction cost	491,200		
Salvage value at year 20			288,700
Existing site - salvage value			42,500
Total capital cost	491,200		
Annual operation and maintenance cost	77,900		

1 Costs above do not include $40,200 bond payoff on existing lagoon system.

2 These costs were computed for pipeline sizes greater than 15 inches; however, decreasing portions of the pipeline from 21- and 24-inch to 15-inch changes the capital costs less than 10 percent which is not significant in comparison to methods used to estimate cost.

3 This is the City of Jacksonville's pro rata share of a total estimated construction cost of $454,367.

4 An estimated savings of $11,670 or 3 percent of the cost would be achieved by reducing the pipe size from 15, 18 and 21 inches to 15 inches.

Impacts

The short-term impacts of Alternative A-3 will be equal in scope and magnitude to those identified for Alternatives A-1 and A-2 in Table 19 (page 87) of the Draft EIS.

Some of the long-term environmental impacts of Alternative A-3 are essentially the same as those identified in the Draft EIS for Alternatives A-1 and A-2. These impacts include: water quality, flood and geologic hazards, soils, archeological resources, vegetation, terrestrial wildlife, aesthetics and project energy consumption. Changing the size of the pipe will not greatly change the magnitude of these impacts.

There are differences in impact magnitude among the remaining direct and secondary impacts of Alternative A-3, because the service area and population to be served are significantly smaller than in Alternative A-1 and A-2 (1,754 acres vs. 6,550 acres and a projected population of 5,861 vs. 9,623 respectively). Property that could be served by Alternatives A-1 and A-2 would not be served by Alternative A-3. Those of importance are as follows:

Population Growth

o Impact on population size.

The projected 1997 human population to be served by Alternative A-3 is 5,861. Sewerage service capability is based on a 1997 population of 5,300 in the City of Jacksonville and the designated urban growth boundary, and 561 in the corridor between Pioneer Avenue and the existing Jacksonville sewage ponds. The proposed pipeline would also have the capacity to serve larger populations.

Population density in Jacksonville and the urban growth area would increase from 1.6 persons per acre to 3.3 per acre. The density of that portion of the service area between Pioneer Avenue and the sewage ponds could increase from 2.4 persons to 3.7 persons per acre.

o Impact on population distribution.

Using Alternative A-3, a majority of future growth in the sewage area will be within the city limits of Jacksonville, its designated urban growth boundary, and the corridor area from the sewage ponds to Pioneer Avenue. When the buildable land within those areas is filled, future urban population growth will probably continue outside of the city limits.

Land Use

o Impact on land use patterns.

The interceptor line from Pioneer Avenue to Jacksonville will result in pressures to convert existing agricultural uses to residential uses of land immediately adjacent to the interceptor system. In the scope of Alternative A-3, development could be limited by an agreement between Jacksonville and BCVSA to 300 feet either side of the interceptor. However, the ultimate use of that land will depend upon the land use policy of Jackson County and decisions made by the County Commissioners and the LCDC.

Air Quality

o Regional air quality.

Alternative A-3 is designed to handle a 1997 population of 5,861 people which is comparable to the projected year 2000 population for the City of Jacksonville (see Appendix H, page 182). Therefore, the expected air pollutant emissions resulting from population growth under Alternative A-3 are judged to be comparable to the "city mid-range" estimates for the year 2000 as presented in Table 20 on page 95.

Traffic

o Impact from traffic and circulation patterns.

Any subsequent residential development in Jacksonville and along the eastern service area corridor will cause an increase in traffic loads, particularly on the Jacksonville Highway (238) and its lateral streets within the City of Jacksonville, the county and West Medford.

Quality of Life and Social Well-Being

o Impact on historical value and integrity.

The development of residential areas along Highway 238 from Pioneer Avenue to Jacksonville would have the most significant impact on the autonomy of Jacksonville. The distinct eastern boundary represented by open space and low density residential development will be significantly reduced as residential growth proceeds along the Jacksonville Highway. However, the maintenance of Farm Residential (F-5) zoning (a minimum of one dwelling per 5 acres) in

that corridor could contribute toward maintaining an open space appearance. Growth in the corridor and the Jacksonville urban area could dilute the historical value and integrity of Jacksonville. The degree of this effect is generally one of personal opinion, and thus, one that should be decided by residents through their governmental processes.

Ability of Alternatives to Meet Project and Environmental Objectives

Table 24 has been revised to include the comparative evaluation of Alternative A-3.

Recomputation of Cost Analyses for Alternatives A-1 and A-2

The reevaluation of cost estimates for Alternatives A-1 and A-2 appear as Tables 12, 13 and 14 herein. The comparative summary for the 20-year total and local costs appears as Table 18. Those cost changes have also been reflected in Appendices C-1 and C-2.

Table 12

Alternative A-1
Bear Creek Valley Sanitary Authority Annexation

Item	Cost Dollars[1]	Life, Years	Salvage Value, Dollars
Capacity purchase in Bear Creek interceptor	102,000	50	61,200
West Medford Trunk extension	476,000[2]	50	285,600
Abandonment of existing treatment facility	10,000	--	42,500
Total construction cost	588,000		
Salvage value at year 20			346,800
Existing site - salvage value			42,500
Total capital cost	588,000		
Annual operation and maintenance cost	77,900		

[1] Costs above do not include $40,200 bond payoff on existing lagoon system.
[2] This is the City of Jacksonville's pro rata share of a total estimated construction cost of $600,000.

Table 13

Alternative A-2
Bear Creek Valley Sanitary Authority Lease

Item	Cost, Dollars[1]	Life, Years	Salvage Value, Dollars
Capacity purchase in Bear Creek interceptor	102,000	50	61,200
West Medford Trunk extension[2]	476,000	50	285,600
Abandonment of existing treatment facility	10,000	0	42,500
Total construction cost	588,000		
Salvage value at year 20			346,800
Existing site			42,500
Total capital	588,000		
Annual operation and maintenance cost[3]	75,000		

1 Costs above do not include $40,200 bond payoff on existing lagoon system.

2 This is the City of Jacksonville's pro rata share of a total estimated construction cost of $600,000.

3 Breakdown of operation and maintenance costs is as follows: Bear Creek interceptor, $500/year; West Medford Trunk, $11,400/year; Kirtland pump station, $10,500/year; treatment, $31,700/year; and Jacksonville sewer system, $20,900/year.

Table 14

Alternative B
Activated Sludge Package Plant and
Discharge to U. S. Forest Service Tree Farm[1]

Item	Cost, Dollars	Life, Years	Salvage Value, Dollars
Operation building, W. Lab.	15,000	25	3,000
0.425 mgd activated sludge plant	325,000	20	0
Chlorination pond, W. equip.	22,000	20	0
Expand existing lagoons for storage	54,200	50	32,500
Fence, roads, landscape	10,000	50	6,000
11,200', 12" diameter outfall	133,000	50	79,800
Total construction cost	559,200		
Salvage value at year 20			121,300
Sites and easements	31,000		31,000
Contingencies and engineering, 25 percent	139,800		
Total capital cost	730,000		
Annual operation and maintenance cost	35,400		

[1] If this alternative is used, there is an additional cost related to sewage services for landowners outside of Jacksonville that is not included. These users could connect to the BCVSD interceptor that terminates at Pioneer Avenue.

Table 18

20-YEAR COMPARISON OF TOTAL AND LOCAL COSTS*

Alternative	Average Annual Equivalent Cost	
	Total Cost Basis, $/Year	Local Cost Basis, $/Year**
A-1	118,600	79,800
A-2	115,700	76,900
A-3	111,000	78,600
B	97,600	49,400
C-1	58,200	32,100
C-1a	37,200	20,000
C-2	72,700	51,700

* In the case of Alternatives B, C-1, C-1a and C-2 sewage services for land between Jacksonville and Pioneer Avenue is not provided. If this area were to be sewered, there would be an additional cost.

** Local cost is the equivalent annual cost of capital facilities after subtracting federal grant, plus the annual operation/maintenance costs.

Table 24

COMPARATIVE EVALUATION RELATING PROJECT ALTERNATIVES TO PROJECT AND ENVIRONMENTAL OBJECTIVES

	A-1	A-2	A-3	B	C-1	C-1a	C-2	D
Project Objectives:								
Provide an institutionally acceptable wastewater disposal system for the citizens of Jacksonville.	1	1	1	2	2	2	2	4
Environmental Objectives:								
Minimize the adverse effects of wastewater treatment and disposal.	1	1	1	2	2	2	2	4
Minimize the social-economic costs of wastewater treatment and disposal.	3	3	2	1	1	1	3	4
Provide for the reuse of treated wastewater.	4	4	4	1	1	1	3	4
Maintain the historical quality of Jacksonville.	3	3	2	2	2	1	2	1

LEGEND:

1 Best

2 Second best

3 Limited

4 Fails

Appendix C-1

ECONOMIC EVALUATION OF ALTERNATIVES - LOCAL COST

Item	Interest Factor	A-1	A-2	A-3	B	C-1	C-1a	C-2
Total capital cost	1.000	588,000	588,000	491,200	730,000	349,500	262,000	317,500
Local share capital cost	1.000	147,000	147,000	122,800	182,500	98,600	65,500	79,400
Interest during construction		22,500	22,500	15,000	22,400	12,100	9,000	9,700
Salvage value	0.30454	-148,100	-148,100	-130,400	-46,400	-58,000	-42,500	-29,800
Total present worth		21,400	21,400	7,400	158,500	52,700	32,000	59,300
Average annual equivalent cost	0.08807	1,900	1,900	700	14,000	4,600	2,800	5,200
Annual operation and maintenance		77,900	75,000	77,900	35,400	36,000	22,200	46,500
Annual net return from sale of crops		---	---	---	---	8,500	5,000	---
Total average annual equivalent cost		79,800	76,900	78,600	49,400	32,100	20,000	51,700

Appendix C-2

ECONOMIC EVALUATION OF ALTERNATIVES - TOTAL CAPITAL

Item	Interest Factor	A-1	A-2	A-3	B	C-1	C-1a	C-2
Capital cost	1.000	588,000	588,000	491,200	730,000	349,500	262,000	317,500
Interest during construction	1.000	22,500	22,500	15,000	22,400	12,100	9,000	9,700
Salvage value	0.30454	-148,100	148,100	-130,400	-46,400	-58,000	-42,500	-29,800
Total present worth		462,400	462,400	375,800	706,000	348,600	228,500	297,400
Average annual equivalent cost	0.08807	40,700	40,700	33,100	62,200	30,700	20,000	26,200
Annual operation and maintenance		77,900	75,000	77,900	35,400	36,000	22,200	46,500
Annual net return from sale of crops		---	---	---	---	8,500	5,000	---
Total average annual equivalent cost		118,600	115,700	111,000	97,600	58,200	37,200	72,700

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

DRAFT ENVIRONMENTAL STATEMENT -- WASTEWATER TREATMENT SYSTEM FOR THE CITY OF JACKSONVILLE, OREGON

Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

1. Type of Statement: Draft (X) Final ( )

2. Type of Action: Administrative (X) Legislative ( )

3. Description of Action:

The objective of this project is to provide an institutionally acceptable wastewater disposal system for the citizens of Jacksonville, Oregon, located 5 miles west of the City of Medford in Jackson County, Oregon. This Draft Environmental Impact Statement identifies alternatives for providing the city with wastewater facilities designed both to meet the needs of the residents of the city and maintain environmental quality. The City of Jacksonville covers approximately 1,300 acres of land and has a population of 2,070 (1975 estimate). In 1967, part of the city was declared a National Historic Landmark.

Since 1973 the City of Jacksonville has had sewer connection limitations which were imposed by the Oregon Department of Environmental Quality because the present treatment facilities were unsatisfactory for adequate treatment of generated waste.

The City of Jacksonville is surrounded by the Bear Creek Valley Sanitary Authority (BCVSA), which provides sewerage service to the City of Medford and surrounding areas. Jacksonville has not become a part of the BCVSA due to the city's past concern for potentially adverse impacts on its historic character as a National Historic Landmark.

In March 1976 the City of Jacksonville initiated a Step 1 grant application to find a means of resolving the waste treatment problem.

4. Summary of Environmental Impacts and Adverse Environmental Effects:

The magnitude of the environmental impacts will vary according to the alternatives proposed. Alternatives A-1 through C represent the hookup to existing or the construction of new treatment facilities while Alternative D represents no action.

Short-term impacts such as temporary loss of vegetation, disruption of wildlife, traffic and utility problems, dust and aerial pollutants, noise, visual impact, safety hazards, spoil disposal and water quality impairments will occur in varying degrees using Alternatives A-1, A-2, B, C-1, C-1a and C-2. No short-term impacts will be associated with Alternative D.

The long-term impacts associated with Alternatives A-1 and A-2 indicate a potential for changes in population distribution and size, project cost and effects on land use patterns; the major impacts of Alternative B will be its effect on groundwater, vegetation and wildlife, archeological resources, population size and distribution and project cost. Impacts resulting from Alternatives C-1 and C-2 will be similar except for variations in effect on groundwater and vegetation and wildlife.

Impacts of Alternative C-1a (no growth) will be similar to those of Alternative C-1 except that the magnitude of effect will be less. Secondary impacts on Jacksonville resulting from population growth will be minor because of the no-growth feature of the alternative.

The major impacts involving use of Alternative D would see a continuation of odor problems, a continued moratorium on building construction and the likelihood of future action by the Department of Environmental Quality.

5. Alternatives Considered:

Alternative A-1 - Bear Creek Valley Sanitary Authority Annexation. BCVSA would extend the west Medford trunk to connect to the existing Jacksonville sewage system. Capital costs -- $735,000. Average annual operation/maintenance costs -- $77,900.

Alternative A-2 - Bear Creek Valley Sanitary Authority Lease. A hookup by Jacksonville to BCVSA would have the same result as Alternative A-2; however, the financial agreement would be different. Capital costs -- $735,000. Average annual operation/maintenance costs -- $75,000.

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

DEC 29 1976

REPLY TO ATTN OF: M/S 443

To: All Interested Governmental Agencies, Public Groups and Citizens

Pursuant to Section 102 (2) (c) of the National Environmental Policy Act of 1969 and implementing Federal Regulation, I am forwarding for your review and comment this draft Environmental Impact Statement (EIS) for a wastewater system to be located in the City of Jacksonville, Jackson County, Oregon. The City has applied for Federal assistance in financing the proposed project pursuant to the Federal Water Pollution Control Act Amendments of 1972 and implementing Federal Regulations.

If you have any comments on this Draft EIS or wish to provide additional information for inclusion in the Final EIS, we would appreciate hearing from you. All comments received will be used by Region X personnel in evaluating the effects of awarding the requested grant.

It is anticipated that receipt of this document will be acknowledged by the President's Council on Environmental Quality in the Federal Register on Friday, January 14, 1977, initiating a forty-five day review and comment period. Comments received through February 28, 1977 will be considered.

Additional copies of this document are available for review in the EPA Region X Library, the Jacksonville City Library, and the Jackson County Library. Please send your comments to:

Richard R. Thiel, P.E., Chief
Environmental Impact Section, M/S 443
U.S. Environmental Protection Agency, Region X
1200 Sixth Avenue
Seattle, Washington 98101

Region X will hold a public hearing to receive oral and written testimony concerning the Draft EIS and the environmental impacts associated with the proposed action. Notification of the date, time and location will be announced approximately 15-days prior to the event in the local newspaper.

Sincerely,

Donald P. Dubois
Regional Administrator

Alternative B - Local Treatment and Use of Reclaimed Water by the U. S. Forest Service. A package-activated sludge plant would be installed at the site of existing lagoons, and treated sewage would be piped to a 500-acre U. S. Forest Service seedling farm and spray irrigated. Capital cost -- $730,000. Average annual operation/maintenance costs -- $35,400.

Alternative C-1 - Aerated Lagoons With Adjacent Agricultural Use. Sewage would be treated in aerated lagoons and disposed of by spraying the treated sewage onto a 77-acre agricultural site adjacent to the treatment site. Capital costs -- $394,500. Average annual operation/maintenance costs -- $36,000.

Alternative C-1a - Aerated Lagoons with Adjacent Agricultural Use (No Growth). Sewage would be treated as with Alternative C-1 and disposed of by its being sprayed onto 50 acres of agricultural land adjacent to the treatment site. Capital costs -- $262,000. Average annual operation/maintenance costs -- $22,200.

Alternative C-2 - Aerated Lagoons with Spray Disposal. Treatment would be identical to that of C-1; however, the disposal site would be on 80 acres of forest land in the hills to the southwest of Jacksonville. Capital costs -- $317,500. Average annual operation/maintenance costs -- $46,500.

Alternative D - No Action Alternative. This alternative would involve a continuation of existing conditions in which sewage would be inadequately treated prior to its discharge into Daisy Creek. Associated with this alternative would be a continued moratorium on construction of sewer connections.

6. The Following State, Federal and Local Agencies, as well as Other Interested Groups, were Invited to Comment on the Environmental Impact Statement:

FEDERAL AGENCIES

COUNCIL ON ENVIRONMENTAL QUALITY

U.S. DEPARTMENT OF AGRICULTURE

U.S. DEPARTMENT OF DEFENSE

U.S. DEPARTMENT OF INTERIOR

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL ENERGY OFFICE

NATIONAL WILDLIFE FEDERATION

NATIONAL MARINE FISHERIES SERVICE

ADVISORY COUNCIL ON HISTORIC PRESERVATION

MEMBERS OF CONGRESS

MARK O. HATFIELD
U.S. SENATE

JAMES WEAVER
U.S. HOUSE OF REPRESENTATIVES

ROBERT W. PACKWOOD
U.S. SENATE

STATE

ROBERT W. STRAUB - GOVERNOR OF OREGON

BRAD MORRIS - STATE REPRESENTATIVE DISTRICT 51

OREGON STATE CLEARINGHOUSE

DEPARTMENT OF ENVIRONMENTAL QUALITY

REGIONAL AND LOCAL

JACKSON COUNTY BOARD OF COMMISSIONERS

JACKSON COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

JACKSON COUNTY HEALTH DEPARTMENT

JACKSON SOIL AND WATER CONSERVATION DISTRICT

CITY OF JACKSONVILLE

CITY OF JACKSONVILLE LIBRARY

CITY OF JACKSONVILLE PLANNING DEPARTMENT

CITY OF MEDFORD

CITY OF CENTRAL POINT

BEAR CREEK VALLEY SANITARY AUTHORITY

INTERESTED GROUPS AND INDIVIDUALS

T. FLATEBO AND ASSOCIATES

1000 FRIENDS OF OREGON

NORTHWEST ENVIRONMENTAL DEFENSE CENTER

OSPIRG

OREGON ENVIRONMENTAL COUNCIL

ROGUE VALLEY COUNCIL OF GOVERNMENTS

SOUTHERN OREGON HISTORICAL SOCIETY

THIS DRAFT ENVIRONMENTAL IMPACT STATEMENT WAS MADE AVAILABLE TO THE COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) AND THE PUBLIC ON JANUARY 14, 1977.

I. INTRODUCTION

Purpose and Objectives

The National Environmental Policy Act of 1969 (NEPA) requires that all agencies of the federal government prepare a detailed Environmental Impact Statement (EIS) on proposals for projects that may significantly affect the quality of the human environment. NEPA requires that agencies (in this case the Environmental Protection Agency [EPA]) include in their decision-making process all considerations of environmental aspects of proposed actions, the environmental impacts of the proposed project and its alternatives, and a discussion of ways to avoid or minimize adverse effects. The EIS is to be a "full disclosure" document and must follow specific regulations of the EPA as contained in 40 CFS, part 6, as published in the Federal Register, Vol. 40, No. 72, April 14, 1975.

Because the City of Jacksonville project can be 75 percent funded by the EPA, as a part of Construction Grants Program authorized by the Federal Water Pollution Control Act amendments of 1972 (PL 92-500), it requires NEPA action. After reviewing the Step 1 grant application from the City of Jacksonville for the planning and construction of a wastewater treatment facility, it was determined by the EPA that an EIS was needed. The decision was based on the potential adverse effects of future growth on the historical integrity of Jacksonville, on changes in land use patterns and effects on agricultural land.

This EIS has been prepared as a "piggyback" document which will allow the draft EIS and draft facilities plan to be prepared concurrently. The "piggyback" approach allows for an evaluation of a variety of alternatives and an option to discard those deemed environmentally and socially unsound. This process also reduces the period of time required to evaluate and subsequently approve a project since the EIS is often prepared after a draft facilities plan is drawn up, a process which tends to lengthen the time needed to select a final alternative.

Data for this EIS were compiled from various existing studies of Jackson County and the Cities of Jacksonville and Medford, field reconnaissance and numerous personal contacts with involved agencies and individuals. A complete listing of references appears in the Bibliography.

The EIS process encourages public input into the decision-making process. This EIS is prepared in draft form to be widely circulated for public comment. Announcements in the local press and a public hearing will be held to solicit responses. After a 45-day public comment period, all replies will be addressed and the EPA decision recommending a grant fundable project will be published as the Final Environmental Impact Statement. Following a 30-day comment period on the Final EIS, the EPA Regional Administrator will announce his decision concerning a grant award for the city.

Background of Past Events

Questions and controversies relating to the collection, treatment and disposal of sewage in the Jacksonville and Medford area arose prior to the EPA decision to prepare an EIS on Jacksonville's proposed project.

The City of Jacksonville in 1963 constructed a sewage collection and treatment system having a design capacity for a population of 1,600. That design capacity was exceeded in 1970 and the Oregon Department of Environmental Quality (DEQ) has limited further connections to the existing system.

In 1966 the Bear Creek Valley Sanitary Authority (BCVSA) was formed to provide sanitary sewage collection and treatment facilities on a regional basis. The authority encompasses approximately 220 square miles of incorporated and unincorporated land, including the City of Talent. A large portion of the unincorporated area within the Authority has been divided into various districts, including West Medford, South Medford, White City and Westside. Jacksonville is surrounded by the West Medford Trunk District.

In 1973 the BCVSA submitted an application for planning, design and construction grant assistance in building an interceptor for the West Medford Trunk District that would be sized to support Jacksonville's sewage, which would be transported to the City of Medford Sewage Treatment Plant. In September 1973 the EPA established that an EIS was not necessary for the proposed construction of the West Medford interceptor. This interceptor was constructed and terminates 1.36 miles from Jacksonville.

The following is a summary of events from 1973 leading to this EIS:

Date	Event
January 24, 1974	The City of Jacksonville requested that an EIS be prepared on the proposed BCVSA project. The city expressed concern about potential degradation of its historic character (it is a National Historic Landmark).
February 7, 1974	A meeting was held with representatives of Jacksonville, BCVSA, Jackson County and EPA. The city proposed that they provide their own sewage treatment with EPA assistance. EPA indicated, however, that such an alternative was likely to be less cost-effective than the BCVSA project. County representatives assured the city that zoning along the interceptor route would restrict development and preserve the city's historic values.
March 28, 1974	EPA notified the city that it felt that the project was acceptable if the grant was conditioned on the city's acceptance of BCVSA service.
August 23, 1974	The State Historic Preservation Office notified EPA that the BCVSA project would not adversely affect the city's historic character, based on a pipeline sized to support 6,000 people.
October 1975	Construction completed on portion of BCVSA interceptor to Pioneer Avenue. This leaves 7,200 feet of incompleted line to the Jacksonville lagoons. Construction of the remaining portions was not undertaken because no agreement could be reached between Jacksonville and BCVSA.
December 19, 1975	DEQ certified to EPA a Step 1 grant application from Jacksonville.
March 2, 1976	EPA's Oregon Operations Office recommends EIS on Jacksonville's proposed project.
March 16, 1976	EPA notifies City of Jacksonville of EIS intent. Memorandum of Understanding to prepare joint Facilities/Plan - EIS mailed to Jacksonville.

Date	Event
March 24, 1976	City of Jacksonville signs Memorandum of Understanding. City agrees to "piggyback" EIS.
April 15, 1976	Meeting held with representatives of Jacksonville and EPA to discuss "piggyback" EIS. Issue paper outlining EPA's environmental concerns delivered.
April 28, 1976	City of Jacksonville releases Request for Proposals to potential EIS consultants.
June 1-15, 1976	City of Jacksonville selects Jones & Stokes Associates for EIS preparation and EPA approves selection.
June 17, 1976	Meeting with EPA, City of Jacksonville, T. Flatebo and Associates and Jones & Stokes Associates to discuss Facilities/Plan - EIS preparation.
June 21, 1976	EPA's Notice of Intent to prepare EIS released.
July 6, 1976	Jones & Stokes Associates, Inc. began preparation of the preliminary draft EIS.

Although the City of Jacksonville hired Jones & Stokes Associates, Inc. to prepare the draft and final EIS, the U. S. Environmental Protection Agency (EPA) has ultimate responsibility in the planning and approval of the environmental documents.

Project and Environmental Objectives

An important element of any project is its objectives. Well defined objectives are essential to establishing a rationale for a project and later to provide guideposts to determine if identified alternatives are justifiable or viable.

The replacement of the Jacksonville wastewater treatment and disposal system is deemed a necessity in part because of institutional requirements -- that is to meet EPA and DEQ regulations for wastewater disposal. For the purposes of this EIS, one facilities objective and four environmental objectives appeared relevant. These objectives are:

Facilities Objective

- Provide an institutionally acceptable wastewater disposal system for the citizens of Jacksonville.

Environmental Objectives

- Minimize the adverse environmental effects of wastewater treatment and disposal.
- Minimize the social-economic costs of wastewater treatment and disposal.
- Provide for the reuse of treated wastewater.
- Maintain the historical quality of Jacksonville.

Important Issues and Considerations

In the course of preparing this EIS, it became clear that there were several key issues relating to the proposed sewage interceptor and disposal system. These issues became evident after discussions with City of Jacksonville officials, personnel of various state and federal agencies and from reviewing relevant correspondence.

The issues listed below are to be identified and evaluated in the Environmental Setting and Environmental Impact sections of this report. Those issues remaining unresolved and/or of greater scope than covered in this EIS will be discussed in Chapter VIII - Issues to be Resolved. Of particular importance to this project are the following:

1. The impact of the project and/or of subsequent growth on the historical qualities and integrity of Jacksonville.
2. The impacts and ramifications of Jacksonville connecting with a regional sanitary authority.
3. Projected growth in the Jacksonville service area for each alternative.
4. Response of traffic and circulation patterns to growth in relation to present and planned roads, streets and highways.

II. ENVIRONMENTAL SETTING

Physical and Biological Features

General Location

The City of Jacksonville is located in southwest Oregon near the City of Medford, Jackson County. Jacksonville is approximately 170 miles south of Eugene, 32 miles from Grants Pass and 5 miles west of Medford. The area lies on the western edge of the Bear Creek Valley at an elevation of approximately 1,570 feet (Figure 1).

Jacksonville is bordered on the south and west by mountainous terrain and on the north and east by the flat margins of the Bear Creek Valley. Most residential and commercial development in Jacksonville is located in and around the intersections of South Stage Road and the Jacksonville Highway.

Study Area

For purposes of evaluating the various alternatives and impacts of those alternatives, two service area boundaries were defined (Figure 1).

Alternative A-1 and A-2 Service Area. A boundary encompassing nearly 13 square miles was defined as the service area for the Bear Creek Valley Sanitary Authority (BCVSA) alternative. The interceptor system is sized to include an area larger than the City of Jacksonville.

Alternatives B, C-1 and C-2 Service Area. A boundary encompassing the City of Jacksonville plus a proposed relatively small urban growth area constitute the service area for the land disposal and crop irrigation alternatives. The treatment system would be sized to handle only Jacksonville and its designated urban growth area. The urban growth area refers to areas tentatively identified by the City of Jacksonville as allowing for future urban development (to year 2000).

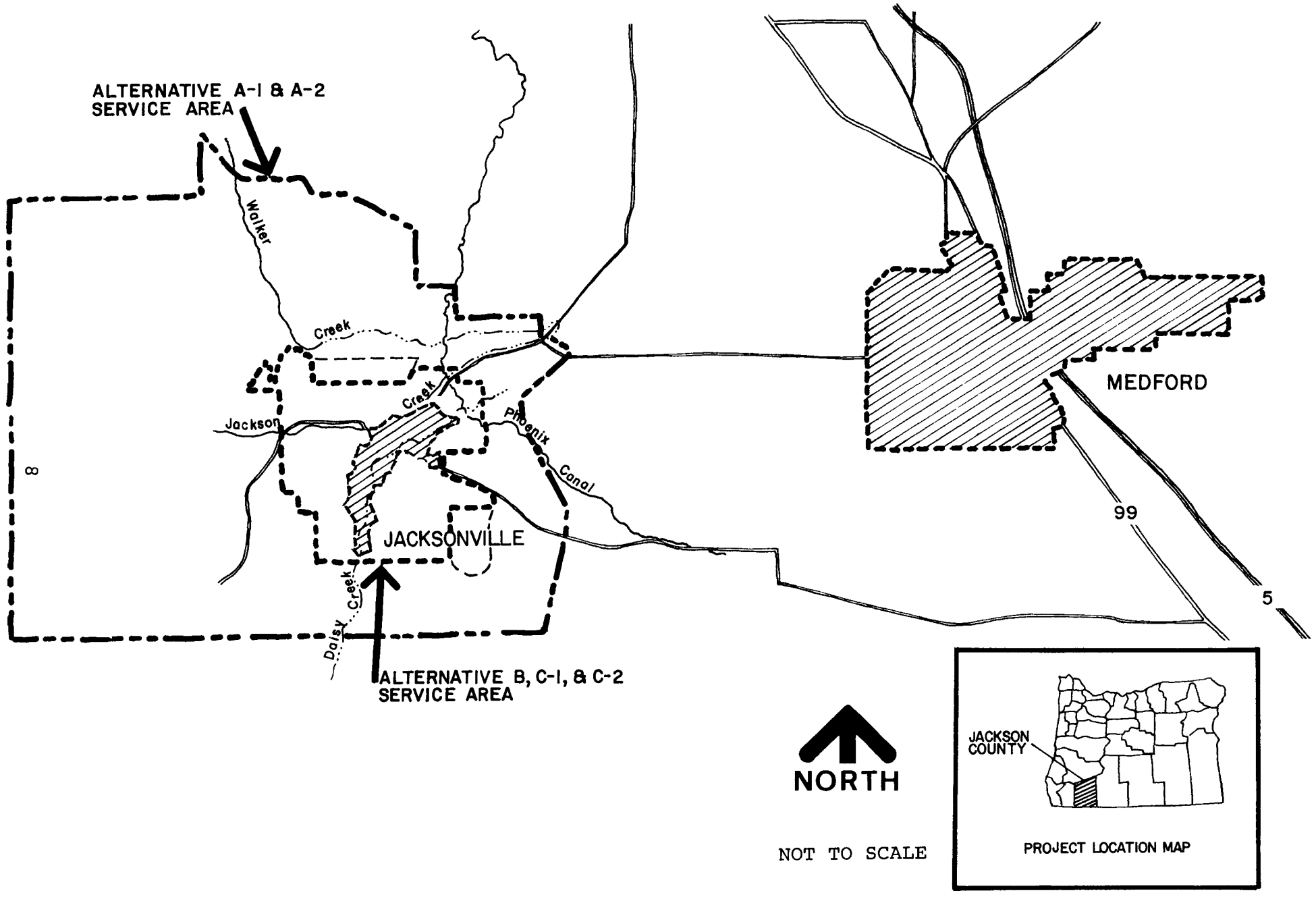


FIGURE I. THE CITY OF JACKSONVILLE AND ENVIRONS

Topography and Drainage

The Jacksonville study area is located on a fan and low terrace at the western edge of Bear Creek Valley. Elevations vary from 1,400 to 1,600 feet above sea level. Most of the study area lies along the eastern margin of the Siskiyou Mountain range.

The study area is bisected by numerous small streams most of which are ephemeral and draining in a generally northeasterly direction toward the Rogue River. Major water courses in the area include: Jackson Creek, Walker Creek, Griffin Creek, Horn Creek, Bear Creek, Daisy Creek, Phoenix Canal and Hopkins Canal.

Climate

The weather in the Jacksonville area is characterized by hot dry summers and mild wet winters. The annual average temperature recorded at Medford Experimental Station is 52.4°F and ranges from an average low of 37°F to an average high of 71°F (Figure 2).

Spring temperatures (April through June) are typically cool with average daily temperatures in the high 40's to low 50's. Temperatures usually reach their maximum late in July and continue high through August. During this period, daytime temperatures average 88°F with occasional readings of 100°F or more. The dominance of moist marine air masses provides for relatively mild fall and winter months with temperatures occasionally falling below freezing.

Average annual precipitation measured at the Medford Experimental Station is 21.3 inches per year. The higher, mountain elevations receive considerably more precipitation, which can exceed 70 inches per year.

Air Quality

The Jacksonville/Medford area has been characterized as having a long-term problem of particulate emissions. Federal primary (health) standards and secondary (welfare) standards were exceeded in 1970. Since that time particulate air quality has improved to a point where federal health standards were not exceeded in 1975; however, secondary welfare standards were not met.

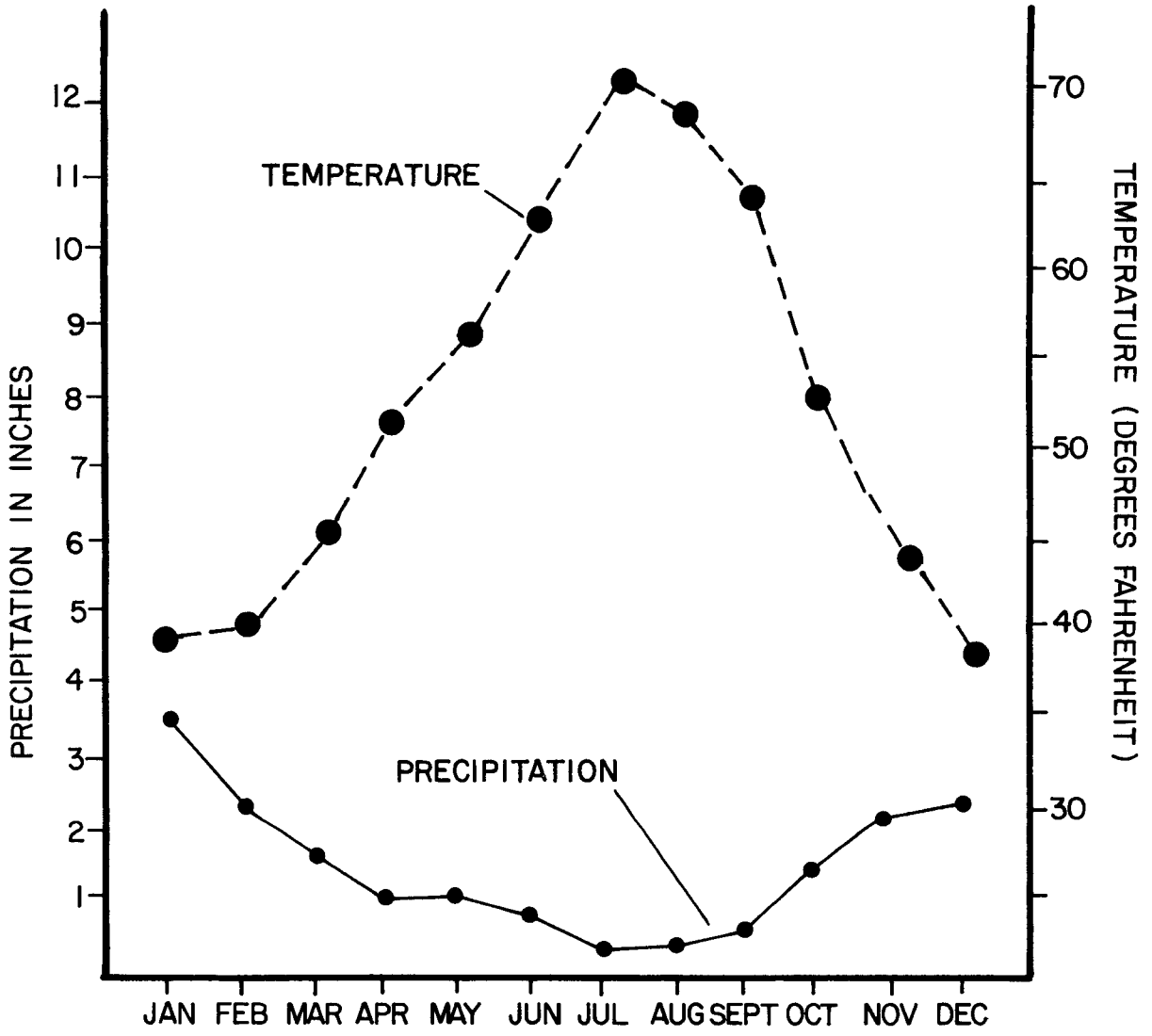


FIGURE 2. MEAN MONTHLY PRECIPITATION AND TEMPERATURE IN MEDFORD, OREGON (US DEPARTMENT OF COMMERCE, 1975).

The Jacksonville/Medford area is considered to be an Air Quality Maintenance Area (AQMA). The need for an AQMA plan is now being evaluated. If an AQMA plan is needed, a draft report will be developed by July 1977 and adopted by July 1978.

During the winter, November through February, temperature inversion tendencies are high in the Bear Creek Valley; this phenomenon occurs in part because of the topographical conditions of the area. It is during these winter months that past violations of air standards have occurred.

Estimates of particulate emissions in Jackson County show wood processing industries and industrial fuel combustion contaminants to be the major source of particulate pollutants in the county (Table 1). Other major sources stem from slash burning and motor vehicles.

In August 1976 DEQ began monitoring photochemical oxidants in the Medford area. Since then, federal standards for oxidant levels have been exceeded 17 times. The major oxidant sources appear to be motor vehicles and plywood veneer dryers.

Sulfur dioxide emission standards have never been exceeded in Jackson County.

Geology

The Jacksonville study area lies on the eastern side of the Klamath Mountain physiographic division of Oregon on the western fringe of the Bear Creek Valley. The mountains to the west of Jacksonville rise 2,000 to 5,000 feet and consist largely of pre-tertiary strata that have been folded, faulted and in places intruded by granite rocks and serpentine masses.

Since Jacksonville lies on the edge of the Bear Creek Valley, a number of geologic formations occur within the study area.

Recent Alluvium (QAL) - The Bear Creek Valley to the east of Jacksonville consists of recent alluvial deposits resulting from the meandering of Bear Creek. These alluvial deposits make up a majority of the prime agricultural lands of the area.

Applegate Group (Tra) - Much of the land to the west of Jacksonville is part of the Applegate group. The formation resulted from folding and metamorphism producing a series of steeply-dipping metavolcanic and metasedimentary layers.

Table 1

SUMMARY: ESTIMATES OF ANNUAL PARTICULATE EMISSIONS IN JACKSON COUNTY

Source	Tons/Year Pollutant Emission Particulates
Fuel combustion --	
Industrial	2,648
Residential/commercial	93
Process loss sources --	
Wood processing industries	2,178
Food/agricultural, mineral, chemical	119
Transportation sources --	
Motor vehicles	526
Off-highway fuel use	24
Solid waste sources --	
Wigwam waste burners, etc.	346
Miscellaneous area sources --	
Slash burning	2,213
Other	365
TOTAL	8,512

Source: Department of Environmental Quality, Ober, pers. comm.

Hornbrook Formation (Kh) - Portions of Jacksonville lie on or adjacent to (north and south) the Hornbrook formation. The rocks were folded and deformed during the late middle Cretaceous period and lie upon older formations. Gold has been mined from conglomerate at the base of this formation in Jacksonville.

Granitic Intrusive Rock (gd) - A small mass of intruded granitic rock lies north of Jacksonville. The commonest rock types are diorite, quartz diorite and granite (Baldwin, 1964).

During 1977 the State of Oregon, Department of Geology and Mineral Industries, will be preparing a comprehensive geological survey of Jackson County (Lilley, pers. comm.).

Geologic Hazards

The geologic hazards of the Jacksonville area have not been well identified. It is expected that during 1977 the State of Oregon, Department of Geology and Mineral Industries, will comprehensively map the geologic hazards of Jackson County.

Earthquake Faults. According to the USGS geologic quadrangle map of the Medford area, no evident or concealed faults are present in the Rogue Valley or along the immediate margins of hills west of Jacksonville (USGS, 1956). A more comprehensive survey of earthquake hazards will likely be conducted during 1977.

Erosion. The soils on most hillsides of 20 percent slope or greater are considered to have a high erosion hazard. In the Jacksonville area these consist of Brader, Debenger, Ruch, Manzanita, Vannoy and Voorhies soil series. A high erosion factor means that soil movement is expected to accelerate in response to rainfall and runoff.

Areas of gentler slopes (1 to 20 percent) generally have a moderate or low erosion hazard.

Flooding. Flooding can be caused by heavy rainfall and melting snow or a combination of the two. Stream flooding is a potential hazard to property along virtually all streams in the Jacksonville area. The hazard is increased where residential development borders streams and wherever higher elevation watersheds are of sufficient size to generate substantial runoff during storms.

In 1965 the U. S. Army Corps of Engineers prepared an interim floodplain information report on Jackson County in which flood hazards on major waterways of the county were delineated.

Flood hazards were not identified along small creeks (Jackson, Daisy, Walker) but were shown on the major waterways such as Bear Creek and the Rogue River.

Edaphic Features

According to a U. S. Soil Conservation Service study conducted in Jackson County in 1974, the Jacksonville area is underlain by ten soil series -- Brader, Central Point, Coleman, Cove, Debenger, Manzanita, Medford, Ruch, Vannoy and Voorhies. The patterns of distribution of the soil series are strongly influenced by parent material and physiographic location. The soils tend to be grouped into three physiographic categories:

- Low Terraces - The Medford, Central Point, Coleman and Cove soils represent low terrace areas that tend to be poorly drained and limited by permeability and drainage.
- Fans - Ruch and Manzanita are well-drained with a permeability limiting factor.
- Hillslopes - The hillslopes consist of well-drained Vannoy, Voorhies, Brader and Manzanita soils (see Figure 3).

Virtually all of the soils (except for Central Point series) have moderate or severe limitations for septic tank drainfield use. These limitations are due to slow percolation, restrictive clay layers and in some areas a high water table.

Much of the land to the east-northeast of Jacksonville is classified for agricultural uses by the Soil Conservation Service as Class I or II, while the steeper areas directly north and southeast of the city are designated as Class III and IV. A majority of the land west of the city is classed V or higher.

Soil classes are based on an agricultural capability system designed by the Soil Conservation System. These classes are defined as follows:

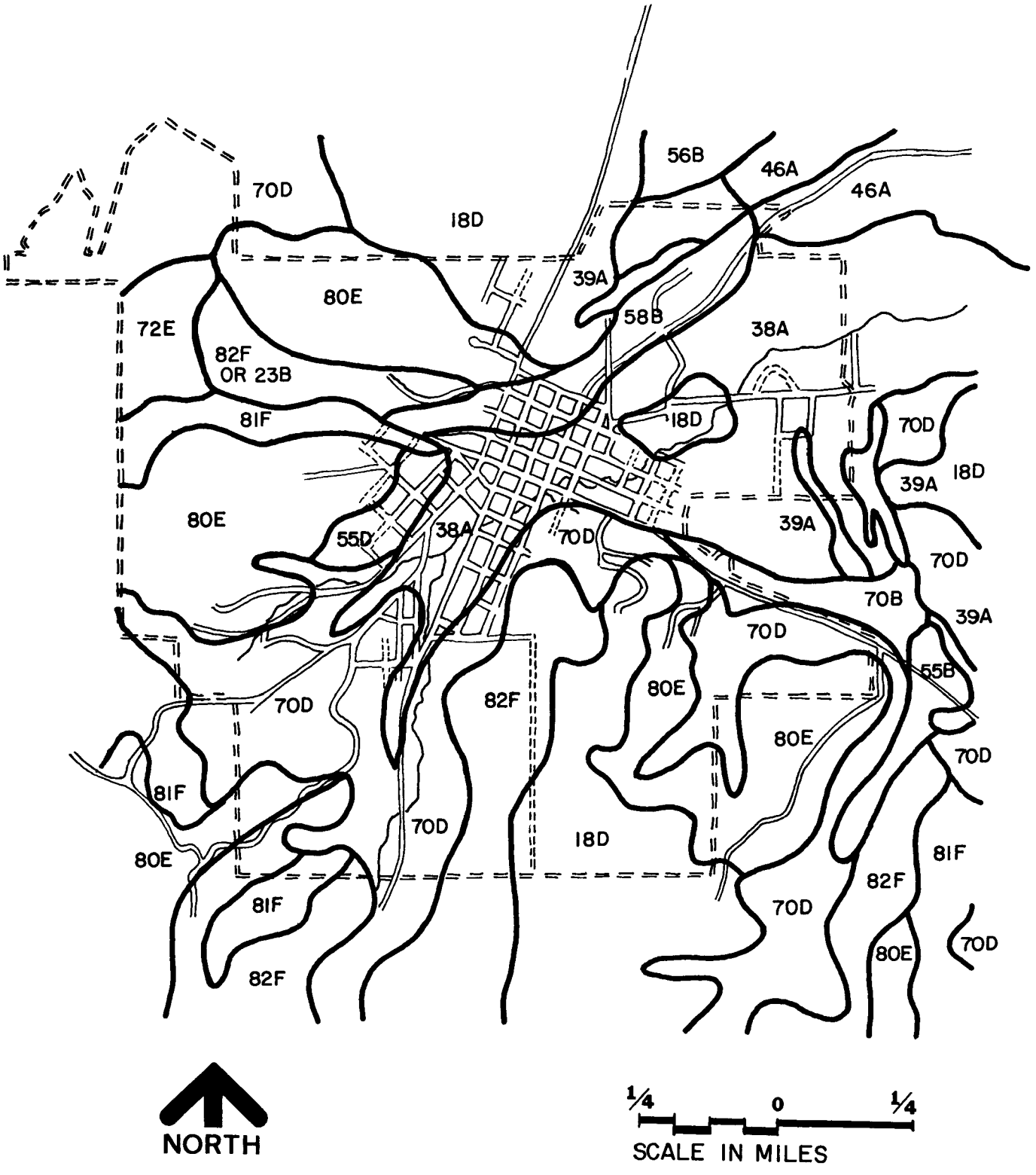


FIGURE 3. SOIL MAP – JACKSONVILLE AREA, OREGON

FROM: USDA, SOIL CONSERVATION SERVICE

SOIL SURVEY LEGEND

City of Jacksonville

Symbol	Mapping Unit	Percent Slope
18D	Brader-Debenger loams	7-20
38A	Medford silty clay loam	0-3
39A	Cove clay	0-3
46A	Central Point sandy loam	0-3
55B	Ruch silt loam	2-7
55D	Ruch silt loam	7-15
56B	Coleman loam	2-7
58B	Ruch gravelly loam, gravelly substratum	2-7
70B	Manzanita loam	2-7
70D	Manzanita loam	7-20
80E	Vannoy silt loam	12-35
81F	Vannoy-Voorhies complex	35-70 North
82F	Voorhies-Vannoy complex	35-60 South

Class I -- Soils having few limitations that could restrict their use.
Class II -- Soils having moderate limitations that reduce the choice of plants or that require moderate conservation practices.
Class III -- Soils having severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV -- Soils having very severe limitations that reduce the choice of plants, require very careful management, or both.
Class V - Soils which are not likely to erode but have other limitations are impracticable to remove, or whose uses are limited to pasture, range, woodland, or wildlife.
(Soil Conservation Service, 1974)

Biotic Resources

Jacksonville is located in the Klamath Mountain physiographic province of Oregon in the rain shadow of the Siskiyou Mountains. The summers are warm and dry and evapotranspiration far exceeds the precipitation of the winter months. Much of the natural vegetation in the Jacksonville area reflects the xeric conditions of the area.

Vegetation. Much of the Jacksonville study area is in a "semi-natural" vegetative condition, because most of the area has been subjected to major human activities such as logging, clearing, grazing or burning (or a combination of these).

Agricultural. Portions of Jacksonville lie on the edge of Bear Creek Valley, much of which is under agricultural use. Vegetation in the valley is a mosaic of irrigated pasture, alfalfa, pear orchards, truck crops and riparian habitat. Uncultivated edges of agricultural lands are typified by annual grasses such as wheat, grass, bentgrass, brome and wildrye and weed and forb species such as yellowstar thistle, yarrow, wild carrot and American vetch.

Riparian. Riparian vegetation along waterways of the study area is characterized by Oregon ash, black cottonwood, bigleaf maple, red and white alder, willows and blackberry.

Oak Woodland and Shrub Communities. The hills to the north, west and south of Jacksonville are vegetated by deciduous oak woodland -- California black oak, Oregon white oak, deerbrush, white-leaved manzanita, poison oak and birchleaf mountain mahogany and scattered ponderosa pine and cedar (Franklin and Dyrness, 1969).

The more xeric areas and disturbed sites are characterized by open grasslands with scattered oak stands and sclerophyllous shrubs such as narrow-leaf buckbrush and tanoak.

Mixed Conifer/Pine Forests. Much of the land on the foothills bordering Jacksonville is vegetated with a diversity of plant species, while Douglas fir is a dominant species; ponderosa pine is present in some areas, along with deerbrush, poison oak and manzanita.

Appendix A-1 identifies the more common vegetation of the study area, while Figure 4 and Table 2 show the present vegetative cover types of the study area.

Fauna. The faunal resources of the Jacksonville area consist of two major groups -- freshwater and terrestrial.

Freshwater Fauna. A majority of the streams within the study area originate in the eastern Siskiyou Mountains and flow in a northeasterly direction to Bear Creek and thence to the Rogue River.

Some of the streams in the area include Jackson, Walker, Griffin, Horn, Bear and Daisy Creeks. Appendix A-3 lists those fish species most common to the streams of the area.

Terrestrial Fauna. A wide variety of terrestrial wildlife species are associated with the agricultural, riparian and oak woodland and shrub communities of the Jacksonville area. Common birds, reptiles, amphibians and mammals are identified in Appendix A-2.

The black-tailed deer (Odocoileus hemionis columbianus) is the most common of the big game mammals in the Jacksonville area. Black bear (Ursus americanus) and mountain lion (Felis concolor) occur in the more remote portions of Jackson and nearby Josephine Counties.

Band-tailed pigeon (Columbia fasciata), mountain quail (Oreortyx picta), California quail (Lophortyx californicus), mourning dove (Zenaidura macroura) and ring-necked pheasant (Phasianus colchicus) are found in varying numbers throughout the region. The ring-necked pheasant, California quail and mourning dove occur in greatest numbers in the agricultural areas to the east of the City of Jacksonville.

Threatened and Endangered Wildlife. Three species of wildlife identified by the U. S. Department of Interior (1973) and the Oregon Wildlife Commission (1975) as endangered or threatened with extinction, could occur within the project area. Those animals are listed in Table 3.

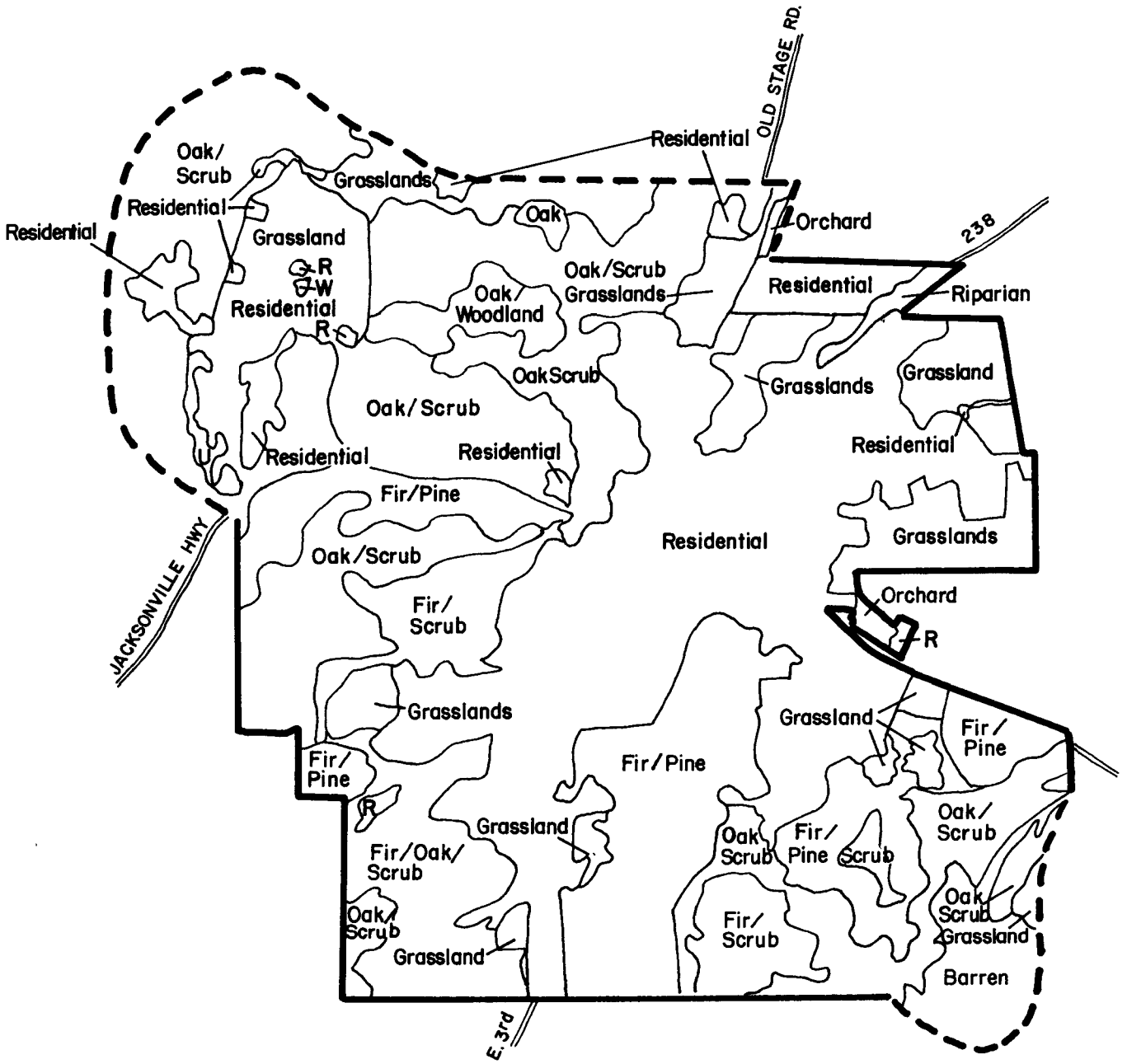


FIGURE 4 VEGETATION AND LAND USE CITY OF JACKSONVILLE AND THE URBAN GROWTH AREA.

Table 2

VEGETATION AND LAND USE -- CITY OF JACKSONVILLE AND URBAN GROWTH AREAS

Land Use or Vegetative Type	Approximate Acres	
	City of Jacksonville	Urban Growth Area*
Residential	411	12
Grasslands	123	48
Riparian	10	--
Orchard	3	3
Oak/scrub	256	214
Oak	12	15
Fir/scrub	87	--
Fir/pine	298	--
Fir/oak/scrub	74	--
Barren	--	36
TOTAL AVERAGE	1,274	328

* Urban growth area refers to areas tentatively identified by the City of Jacksonville as allowing for future urban development (to year 2000).

Table 3

ENDANGERED AND THREATENED VERTEBRATE SPECIES
WHOSE DISTRIBUTION INCLUDES THE
SOUTHEAST LINCOLN STUDY AREA

Common Name	Scientific Name	Present Status			
		Federal[1]		State[2]	
		FR	T	T	E
Peregrine falcon	Falco peregrinus tundrius	X			X
Northern bald eagle	Haliaetus leucocephalus alascans			X	
Northern spotted owl	Strix occidentalis caurina			X	

[1] Federal Status

FR Federal Register - Species is on the official endangered species list, Federal Register, June 4, 1973.

T Those species identified by U. S. Fish and Wildlife Service, 1973. Threatened Wildlife of the United States.

[2] State Status

T Threatened.

E Endangered

Source: Oregon State Wildlife Commission, January 1975.

Only one species, the northern spotted owl, is likely to reside in the study area. The other listed species could occur in the study area for at least part of the year.

Aesthetic Values

Much of the land surrounding Jacksonville is agricultural, accompanied by natural vegetation, thus providing a diverse scenic environment encompassing oak woodland/conifer woodland, riparian vegetation and agricultural acreage.

The hills and uplands to the west of Jacksonville provide the major visual setting for the city. In addition, the location of the City of Jacksonville on the western edge of the Bear Creek Valley allows for a broad panoramic view eastward across the valley to the Cascade Mountain Range.

The City of Jacksonville is an historic landmark because of the presence of many buildings representative of the era from the 1850's to the early 1900's. The historic and quaint nature of Jacksonville attracts many visitors and tourists to the city each year.

The aesthetic quality of the Jacksonville area generally results from the maintenance of the historic values of the city coupled with the natural beauty of the surrounding lands.

Water Resources and Water Quality

Surface Water. The study area contains reaches of three small creeks -- Jackson Creek, Walker Creek and Daisy Creek. Jackson Creek is a perennial creek maintained almost exclusively by agricultural return water during the summer low flow period. Walker Creek is an ephemeral creek and may cease to flow during the dry summer months. Daisy Creek is naturally an ephemeral creek; however, wastewater discharged from the Jacksonville sewage ponds presently maintains a continuous flow. These creeks generally react immediately to rainfall and exhibit peak flows within a few hours of a storm.

The quality of surface waters in the Jacksonville area varies throughout the year. In streams receiving wastewater the quality is typically poorest during the low flow summer months. Jackson, Griffin and Daisy Creeks are representative of streams that have been degraded by wastewater inflows and agricultural irrigation return water.

Several streamways also receive inflow from septic tanks and drainfields which malfunction periodically.

Groundwater. Groundwater resources are of somewhat limited quantity in the study area. Agricultural irrigation in the Bear Creek Valley places a high demand upon the groundwater resources. However, groundwater levels have remained somewhat static because much of the water used for irrigation subsequently percolates back into the groundwater table. A combination of agricultural irrigation recharge and natural accretion has probably prevented overdrafting of the groundwater resources. However, replenishment of the groundwater with agricultural return waters has brought about some degradation of the groundwater quality.

Water Use and Supply. The City of Jacksonville derives its water supply from the City of Medford via an 8-inch pipeline. Prior to the Use of Medford water, Jacksonville obtained water from Jackson Creek.

As of 1970, Jacksonville used an average of 289,000 gallons of water per day to serve a population of 1,600 through 600 service connections. Water from the Medford pipeline is stored in three reservoirs which have a capacity of 1.26 MG (million gallons). Water must be pumped to these reservoirs for storage and then distributed to Jacksonville via a gravity flow system.

According to the Jackson County comprehensive areawide water and sewerage plan prepared by Stevens, Thompson and Runyon, Inc (1973), the present average daily water demand for Jacksonville is 0.289 mg, or 181 gallons per capita per day average consumption. This is somewhat lower than the national average of 200 gpcd (gallons per capita per day). Per capita water consumption is expected to continue to increase to 210 gpcd. With projected increases in population and per capita water consumption, it will be necessary for Jacksonville to expand the 8-inch water line to 14 inches and to provide an additional 1.0 MG storage system.

Existing Sewage Disposal Conditions

In 1963 the City of Jacksonville constructed a sewage collection and treatment system consisting of 7 miles of 8- to 15-inch diameter sewers and a 2-cell sewage stabilization pond with approximately 9 acres of surface area.

The stabilization ponds were designed for a population of 1,600 -- a population size which was achieved during 1970. The present population (1975) of Jacksonville is estimated to be 2,070 with approximately 628 customer units connected to the sewerage system.

The State Department of Environmental Quality (DEQ) has established a maximum 5-day BOD loading of 35 pounds per acre per day for cell lagoons. Under present conditions the present facilities are being loaded above capacity and DEQ has restricted further connections until a new treatment system can be provided. DEQ has established in the NPDES permit for Jacksonville, that the average 5-day BOD shall not exceed 54 pounds per day with a weekly average not to exceed 108 pounds per day and with a daily maximum of 162 pounds.

In June 1973, the DEQ limited the City of Jacksonville to 25 sewer connection permits in order to limit the overloading of the sewage system. In November 1974, an additional 25 permits were allocated, with a request that existing malfunctioning septic systems be given priority to connect to the sewage system.

In April 1976, at the request of the City of Jacksonville, the DEQ surveyed subsurface disposal systems on South Oregon Street. As a result of the survey, 9 permits were allocated to those systems found to be malfunctioning or questionable.

Homes in some portions of Jacksonville are still on septic systems. Many function properly while others periodically malfunction because of poor maintenance or the inherent problems of subsurface sewage disposal in the Jacksonville area.

Appendix B shows the sewage flow for the City of Jacksonville for the years 1973 through 1975. The flow data show that infiltration/inflow is of considerable magnitude during high rainfall months.

Archeological Resources

Very little archeology study has been accomplished in the Rogue River drainage basin, particularly in the vicinity of Bear Creek Valley. The earliest published work was accomplished by Luther Cressman (1933a; 1933b) in 1931 and 1932 at Gold Hill, Oregon. He recovered what may be some early flexed burials. Included among the grave offerings were large obsidian blades and leaf-shaped projectile points. Later material overlaid the burials.

Wilbur Davis excavated several sites in the Lost Creek and Elk Creek vicinities in 1967, 1968, 1972 and 1973 (Davis, 1968, 1970, 1974). Davis' work was a forerunner to hydroelectric dam construction on the two streams. Davis' work has established a cultural history along the upper Rogue River extending back at least 6,000 years. Encompassed within this 6,000-year period are four provisionally-defined phases (Davis, 1974).

The only upland survey published to date in the vicinity of Jacksonville produced negative results. This was Wilbur Davis' (1964) survey of the Oregon Caves National Monument.

As stated in the regulations for preparing environmental impact statements Federal Register, Vol. 40, No. 72), the EPA is subject to the requirements of the National Historic Preservation Act of 1966 and the archeological and Historic Preservation Act of 1974.

For purposes of this EIS, an archeological survey of the alternative pipeline routes was conducted by David Brauner of Oregon State University. The results of the survey are presented in the impact section of this document, while an account of the cultural background of the early inhabitants of Jackson County is presented in Appendix E.

Historical Resources

Historical Background. A discussion of the discovery, settlement and early growth of Jacksonville, Oregon, is presented as Appendix E of this EIS. A more contemporary look at Jacksonville is presented as a discussion of the Socio-Economic Features immediately following this next section on the federal and state designation of Jacksonville as an historic place.

Federal and State Inventory of Historic Sites. In August of 1967 Jacksonville was dedicated as a National Historic Landmark, a distinction that led to its being placed upon the National Register of Historic Places and making it one of four residential communities to be so dedicated in the United States. Originally, the historic area was comprised of and confined to 4-1/2 square blocks within the downtown area. In 1972, however, the historic core was expanded to include a majority of downtown buildings. Also included was the site where gold was originally discovered near Jacksonville.

Socio-Economic Features

Description

The City of Jacksonville is located some five miles west of Medford in the mid-western portion of Jackson County. It is readily accessible from a northern exit off Interstate Highway 5 or by northern and southern routes from within the City of Medford. There is access from other highway routes, but access is less direct.

Jacksonville is located in the western portion of Jackson County on the edge of the Siskiyou Mountain Range. To the north are rolling hills and agricultural lands, while the southern boundary is marked by rolling and gently sloping hillsides; to the east are its prime agricultural lands.

Jacksonville City Government consists of a mayor, the city council, city administrator, and a planning assistant supported by Comprehensive Employment Training Act (CETA) funds and a clerical staff. Support services include an all-volunteer fire department whose members are paid a $2.00 gratuity per response to a fire, and a volunteer chief who receives an annual allotment of $300.00 for his services. There are three full-time salaried policemen. Equipment can be dispatched from nearby communities on a need basis.

The evolution of Jacksonville has been that of a bustling town, prominent in county and state affairs and economically significant (mid to late 1800s), to one of little or limited significance (early to mid 1900s), to one of little or limited significance (early to mid 1900s), and culminating in its present status as a historical landmark.

The city has strived to maintain this historic image in part through its architecture. Many of the buildings within the historic section (downtown) are not original, while several that can claim originality are thought to be structurally unsound. The effort nevertheless continues to be made to preserve the historical imagery regardless of the structural condition of buildings.

Jacksonville's citizenry have a presumed commitment to preserve Jacksonville's historic character and integrity. Their primary concerns center around community growth, the wastewater treatment plans and associated growth, economic dependence, and outside interference in community matters.

The people of Jacksonville are faced with major divisive issues over the town's historical preservation and its potential development in other directions. The majority of the residents interviewed are not opposed to a slow, well

defined, and well controlled growth (Interview: Jacksonville City Government, Citizen interviews). This majority would prefer a controlled growth with the maintenance and expansion of historical features. No isolatable faction or individuals support wholesale and rapid residential, commercial, industrial, or other development for the City of Jacksonville.

The community can best be described as a "bedroom community", one that is dependent upon other areas to provide jobs for its residents. Housing and property values are in an acute state in Jacksonville. Although adequate housing is available, it is very expensive. City government is undermanned and the tax base is small. Support services consist of a volunteer fire department and part-time police agency.

The key areas of planning and growth in Jacksonville proper as defined by city government are: 1) the downtown core area, 2) the Stage Coach subdivision to the southeast, 3) the northwest trailer court, and 4) the Paradise Ranch subdivision, also to the northwest. Jacksonville is a conglomerate of residential areas including the affluent, the modest, and the poor. The condition of residential areas further illustrates the diversity of wealth and attitudes within Jacksonville's population.

Population

Present Population - Jacksonville. Jacksonville's population is heterogeneous and consists of the following, locally defined categories:

1. Native or long-time resident
2. Newcomer -- active and retired
3. California immigrant -- active and retired

Although there are no statistics to account for the percentages of people that comprise these population categories, Jacksonville claims some 2,070 persons in its 1975 population, nearly 2 percent of the county's total of 110,700. The influx of California immigrants presents an interesting phenomenon in that residents of Jacksonville have historically thought that Californians were buying all their lands for residence purposes as well as for speculation. Research by the Jackson County Tax Assessment Office indicates that this belief was prevalent in the late 1800s and still persists. No reason is given for this attitude, but the assessor's office claims this wholesale purchase of such lands by Californians is not true now, nor has it ever been. The county shows no large land transactions from out-of-state buyers. Indications are that most of the buying of land in and around Jacksonville is done by county or state residents (Interview: Jackson County Department of Tax Assessment, 1976).

Jacksonville's growth since 1940 has been slower than that of Medford or the county. Table 4 indicates the growth of Jacksonville from 1940-1975 in comparison with that of the City of Medford and Jackson County.

Jacksonville's slower growth is probably attributable to reduced economic opportunity for its residents. In fact, Medford has been the chief attraction in terms of county economic opportunity, while Jacksonville has appealed to people who desire to live in a rural environment and work in an urban area.

Jacksonville's age composition shows a slightly higher percentage of persons 45 years and older than does the remainder of the county or the state (see Table 5). It is noteworthy that a slightly higher percentage of people age 65 and over reside in Jacksonville. The largest concentration of people age 65 and over in the State of Oregon is found in Lincoln County (18.2 percent). Jacksonville's percentage is 17.9 percent, which is a strong indication of the attractiveness of the city as a retirement community. The presence of large numbers of retirees also represents a unique attitudinal adjustment for the town. The median age for Jacksonville residents is 34.6 years, or 4 years higher than the county median age.

Figure 5 portrays the present city limits of Jacksonville along with its proposed urban growth boundaries (UGB). An urban growth boundary is in the process of being designed for the southeast, north, and northwest sections of the city. Growth also can be expected along the western foothills, which already sustain abundant housing. Planners for Jackson County generally concur with Jacksonville's proposed growth patterns and plans and would not interfere unless the UGBs were designed to invade the prime agricultural lands to Jacksonville's east and toward Medford (Interview: Jackson County Department of Planning and Development, 1976). Jacksonville's most recent annexations have been to the north and to the east -- a trailer park and the Stage Coach subdivision.

Housing is said to be experiencing a rapid, inflationary trend in Jacksonville. Presently, a modest three-bedroom home with a bath and one-half will bring $40,000 on the real estate market. Some of the less affluent people who work in Jacksonville are thus forced to locate their families in trailer parks or in other outlying, less expensive areas (Interview: Jacksonville City Government, 1976).

Table 4 Jacksonville's Population Growth in Relation to Medford and Jackson County, by Years, 1940-1975.

	1940	1950	1960	1970	1975	Numerical Change 1940-1975	Percent Change 1940-1975
Jacksonville	761	1193	1172	1611	2070	+1804	+172
Medford	11281	17305	24425	28454	34000	+22179	+201
Jackson County	36213	58510	73962	94533	110700	+74481	+206

Source: Bureau of Municipal Research and Service, 1958; State of Oregon, 1974; Jacksonville City Planner, 1976.

Table 5 1970 Age Characteristic of Jacksonville, Jackson County, and the State of Oregon, in Percentages

Age Category	Jacksonville	Jackson County	State of Oregon
Under 20	33.7(est.)	36.0	37.0
20-44	27.0	39.6	31.0
45-64	21.5	22.2	21.0
65 and over	17.9	12.0	11.0

Source: State of Oregon, 1974; Plambeck, 1975.

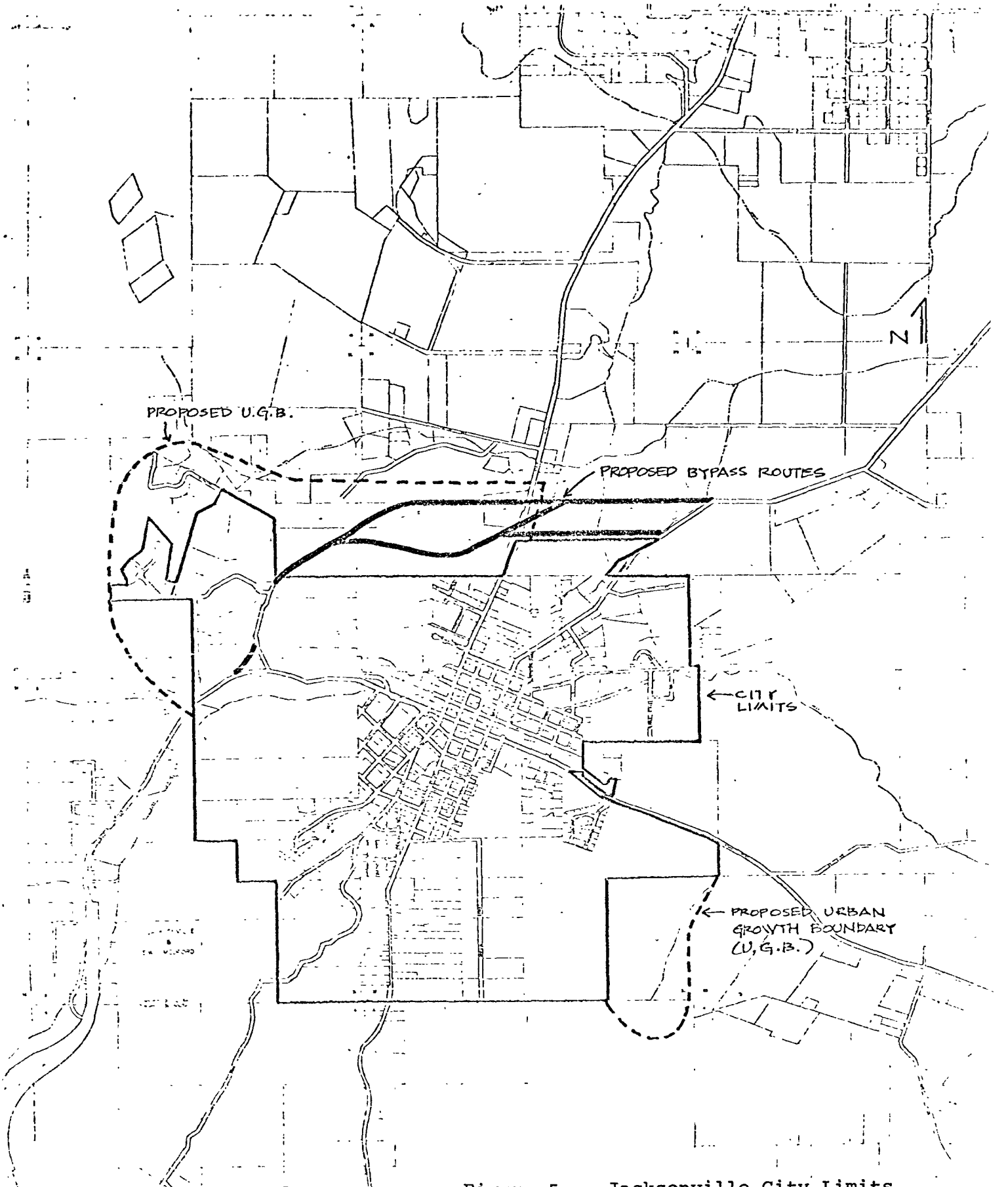


Figure 5. Jacksonville City Limits and Proposed Urban Growth Boundaries (UGB).

Present Population - Surrounding Area. For purposes of this EIS, present population estimates were made for the area surrounding Jacksonville that constitutes the likely service area for Alternatives A-1 and A-2 (Figure 1). No census data have been derived from that specific area; however, some estimates from county census tracts are available. The present population of the service area is approximately 500 (BCATS census data; Hogg, pers. comm.) (Figure 6).

Projected Population - Jacksonville. The population projections for the City of Jacksonville are presented in Figure 6. Jacksonville's realizable population growth in the future will depend upon a host of intervening variables. Among them are the projected selection of a wastewater treatment plan, the availability of additional housing and associated property values, the expansion of city services, and a more diverse and expanded economic base. Also of importance is Medford's continued appeal as an employment center for the county.

The population projections in Figure 6 were derived by applying a variety of population study techniques. For example, the estimates made by the Bonneville Power Administration (BPA) are computed from the County Census District (CCD) of which Jacksonville is a part. BPA applied trend findings for past population growth percentages in the CCD to a population estimator (for Jacksonville) which has been developed by Portland State University. This technique assumes that the factors which led to the spatial distribution of population in Jackson County in the past decade would continue to operate in subsequent decades (Interview: Jacksonville Assistant Planner, 1976).

The preliminary population projections made by the City of Jacksonville (Figure 6) were based on a variety of assumptions bearing on growth policy, regional economic conditions, desirability of living in Jacksonville and provisions of public services. The 5 percent growth represents the approximate historical growth rate of Jacksonville, while the medium and high projections represent growth rates characteristic of recent moderate (1968 to 1975) and high (1968 to 1972) population increases. A more complete description of the assumptions for population projections is presented in Appendix F.

Jacksonville's largest population surge since 1860 occurred between 1940-1950 when it increased by 56 percent. Historically, the county and the City of Medford have grown at much faster rates and have realized larger percentage increases than has the City of Jacksonville. In all

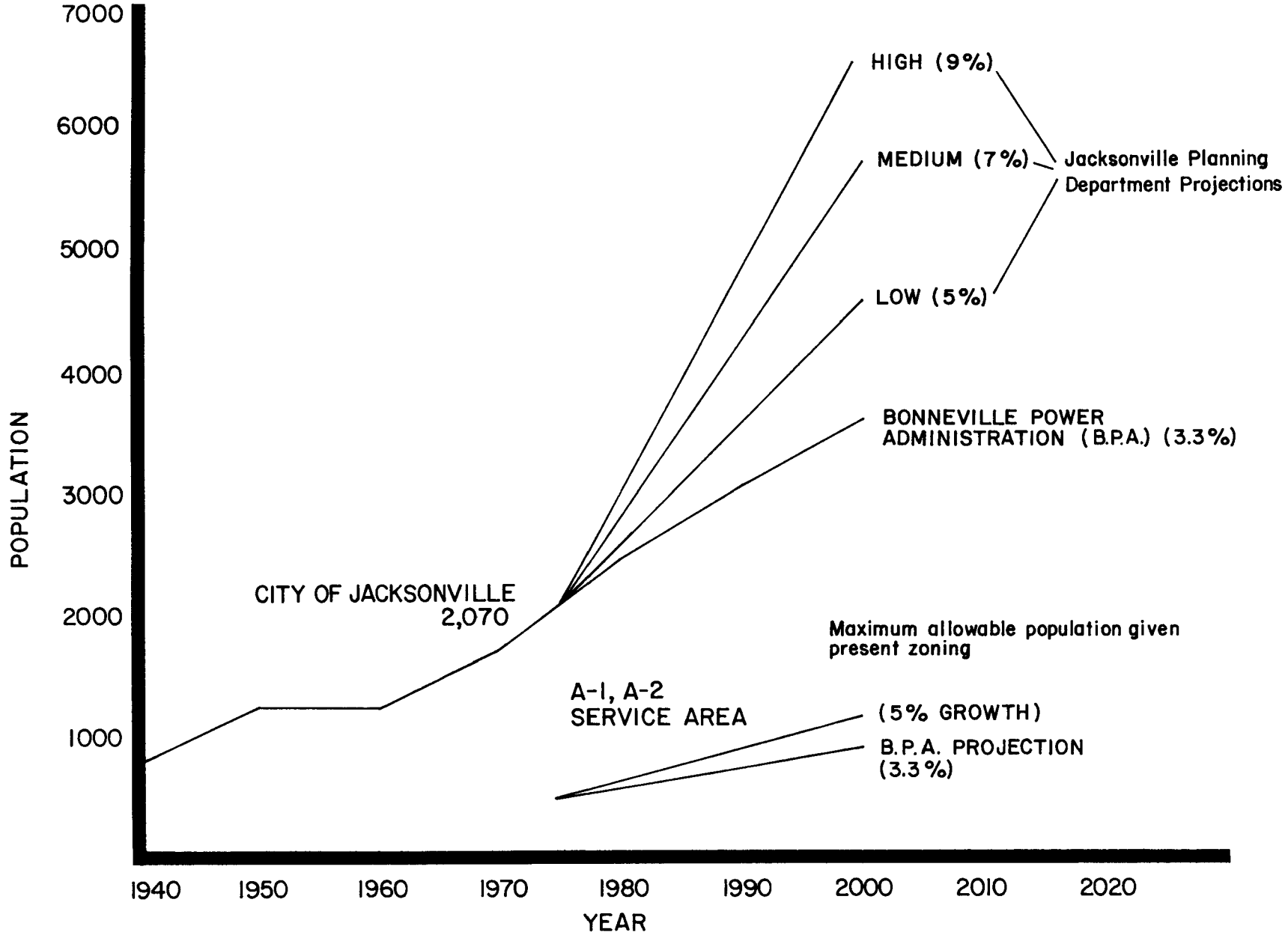


FIGURE 6 POPULATION PROJECTIONS TO THE YEAR 2000 FOR JACKSONVILLE AND THE SURROUNDING SERVICE AREA.

likelihood this trend will continue for some time into the future. Medford, therefore, will continue to be the area's chief economic attraction, although some people will still choose Jacksonville for residential settlement. Jacksonville's continuing desirability for retirement is difficult to project. The city will probably continue to attract higher percentages of individuals from age 65 and over even though recreation is not as much as a factor here as it is in coastal Lincoln County.

Projected Population - Surrounding Area. The service area for Alternatives A-1 and A-2 encompasses approximately 6,550 acres. Based on the present zoning classifications of rural-residential and open space development (1 dwelling per 5 acres) for the land, and 3.3 persons per household, a maximum of 4,323 persons could inhabit the area. Using a 5 percent growth estimate, the population could reach 1,050 by 1997 (Figure 6). It is unknown whether this total will ever be achieved because of factors such as 1) potential zoning changes, and 2) constraints to development such as slope, soil type, etc. A population approaching 3.3 percent growth (Figure 6) appears to be a more realistic estimate.

Urban Growth Boundary. As a requirement of the 1973 Land Use Act, the City of Jacksonville is preparing an urban growth boundary (UGB). This UGB represents an area outside of the present city limits that would allow for projected urban development to the year 2000. This boundary size is based on a format established by the Land Conservation and Development Commission (LCDC) whereby the following factors are considered: 1) retention of soils with agricultural classifications I-IV (U. S. Soil Conservation Service); 2) provision of support services such as sewer and water; 3) a genuine need to accommodate the proposed population growth; and 4) county coordination and agreement with the proposed boundary area.

The urban growth boundary as now identified has, in concept, been approved by the Jacksonville Planning Commission. The final boundary size has not been established or approved by Jackson County or LCDC.

Economy

Jacksonville diverges from the general resource economics pattern of the county in that forest products neither dominate the employment picture nor do they furnish the income for most Jacksonville residents. Almost half of the local Jacksonville work force is engaged in logging or lumbering. A nearly equal number of people work in agriculture around Jacksonville but do

not necessarily live there. Jacksonville possesses few commercial or industrial enterprises that serve areas beyond the immediate community, and this worker category is smaller than might be expected. Some "cottage-type" industry is developing, largely in the area of enterprises to attract more tourist dollars. In recent years, Jacksonville has become a "bedroom community" to Medford with nearly three fourths of Jacksonville workers deriving their incomes from Medford payrolls.

Agriculture and Farming. Adjacent to the Town of Jacksonville are nearly 3,000 acres of Class 1 farmland, some of the best in Jackson County. Most of this acreage is devoted to seed production, alfalfa, fruit orchards, some pasturage for sheep, cattle and horses, and a few vegetable crops. Farmlands adjacent to Jacksonville comprise about 3 percent of the total cropland in Jackson County (Interview: Oregon State University Extension Service, 1976).

Most of the farms, with the major exception of an Oregon State University experimental farm, are family operations. Some of these farms have been in production for more than a generation. The major lands in production include those to the immediate north and east of Jacksonville. According to 1970 data, approximately 1.6 percent of the labor force of Jackson County was in the farmer and farm manager category, whereas 8 percent of the work force was involved in agriculture, including forestry and fisheries. Considering these data to be reasonably typical of Jacksonville, they would translate into estimates of a farmer-farm manager population of 12 persons and an agricultural work force of slightly over 55 persons, not including seasonal labor. Actual census or survey data are lacking, however.

One of the major issues surrounding development in Jackson County involves the maintenance of agricultural lands. In Jacksonville this same issue emerges with most people and agencies articulating a strong desire to maintain Jacksonville's separateness from Medford. At the same time there is substantial pressure for development of these lands. Even though Medford possesses an almost equivalent open space within its municipal boundaries, the fear of encroachment and urban sprawl is quite strong. The potential is there for the loss of lands. Within the past few years open lands have been lost to housing and other developments, some of which show little or no planning.

Commerce and Industry. According to the Oregon State offices of the Research and Statistics Laboratory, Jacksonville's manufacturing and processing industries are few and have a small work force. Data reported for 1976 show 56 persons employed in logging while petroleum and stainless steel (metal fabrication) employ only 4 persons.

Other commerce includes a telephone utility, banking and small business operations, including restaurants and curio shops. According to a 1974 report by Haynes and Cox, only 7 percent of their survey respondents were actually employed in Jacksonville. Recomputing their data, by housewife deletion, this places an estimate of the Jacksonville work force at approximately 500 persons, about 12 percent of whom are estimated to be employed in Jacksonville. Since the work site for loggers working for Jacksonville firms is not within the town per se, it is estimated there is an in Jacksonville work force of approximately 120 persons, half of whom are in manufacturing or processing of wood products and the other half in retail or wholesale trade or commercial enterprises.

Tourism. Tourism is a very important activity in Jacksonville, but the financial return from visitors is not great. Few data are available to indicate the magnitude of the tourist dollar for Jacksonville. Since Oregon has no sales tax an accurate tourist revenue assessment, based on retailer's records, cannot be made.

In the absence of motel facilities in Jacksonville, tourist traffic surveys are nonexistent. The only data available that would offer some indication of tourism figures are those provided by the Jacksonville museum. Those data are presented in Table 6.

Employment. Table 7 shows Jacksonville to have a high percentage of managerial and administrative personnel, laborers, and retired persons relative to the county population. Conversely, Jacksonville has relatively low percentages of professional -- technical, clerical-kindred, craftsmen-kindred, operatives, service workers and unemployed. The data suggest a generally affluent population in Jacksonville even through there is a slightly higher percentage of laborers than for the whole county. Few Jacksonville residents occupy service-related positions or lower level organizational positions.

Table 6 Visitors to the Jacksonville Museum

		Nr. increase	%income
1970	1,092,561	95,173	+8.7
1971	1,187,734	91,518	+7.7
1972	1,279,252	77,963	+6.1
1973	1,357,215	63,215	+4.7
1974	1,420,430	130,014	+9.2
1975	1,550,444		

Table 7
Employment Categories: Jackson County and Jacksonville

	Jackson County (1970)	Jacksonville (1973)
Professional, Technical and Kindred Workers	13.0%	10%
Managers and Administrators	9.9%	12%
Salesworkers	8.2%	8%
Clerical and Kindred	15.3%	5%
Craftsmen and Kindred	12.9%	9%
Operatives	9.6%	6%
Laborers (except farm)	6.3%	9%
Service Workers	13.2%	6%
Private Household	1.3%	1%
Unemployed	8.5%	2%
Retired	28.6%	34%

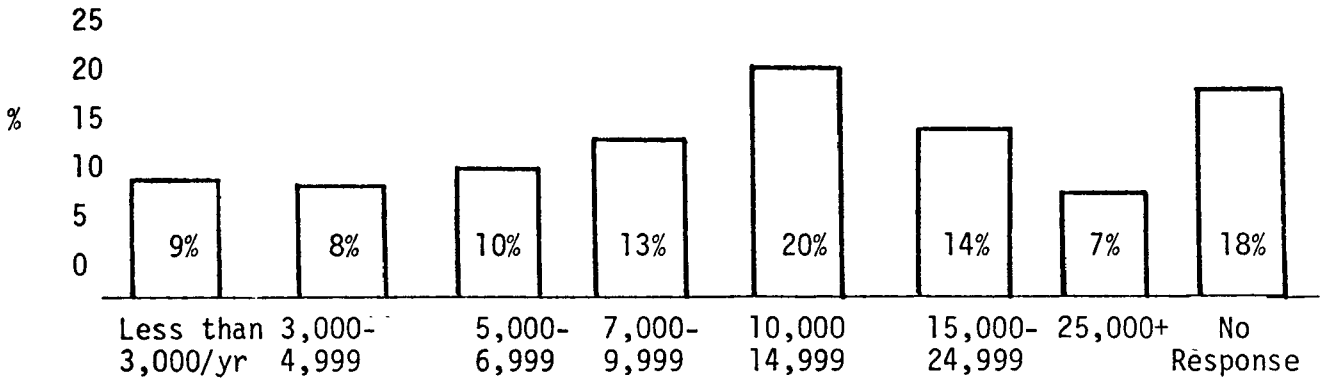
*An estimated 20,000 persons in Jackson County were receiving Social Security in August, 1976. Relative to a workforce of 50,000, the above computation is made. No adjustment has been made for widow - widower benefits.

Income data reflect the same judgments. Table 8 shows the income distribution for Jacksonville. Considering that 34 percent of the people represented in the figure in Table 9 are retired, the figures are all the more significant with respect to affluence. Jackson County data for 1970 are not fully comparable but show the following in comparison with Jacksonville.

While the data in Table 9 continue to suggest Jacksonville's general affluence, median income data place Jacksonville's position at approximately $10,000 per annum as compared to a 1970 figure of $9,624 for Jackson County families. Adjusting for inflation in the four-year period, but not accounting for the higher percentage of retirees in Jacksonville, the Jackson County median wage is well above Jacksonville's. A differential of $1,000 is estimated to have existed in 1975. The conclusion, therefore, is that Jacksonville manifests proportionately as much poverty and as many lower income households as the whole county. The remainder of the Jacksonville population, a substantial portion, ranges in the middle to upper strata in economic means and their activities tend to mask the nonaffluent elements.

As previously mentioned, Jacksonville's labor force consists of nearly 500 persons, only 12 percent of whom work in Jacksonville. Including the some 60 other persons employed by Jacksonville firms, approximately one quarter of the people living in Jacksonville have an employment base there. Forty-three percent work in Medford (Haynes and Cox, 1974) and another very small percentage of workers are employed in other valley towns or work outside the immediate locale. This pattern has persisted over the past 7 years insofar as 74 percent of Jacksonville's population has been stable in the county during the period (Haynes and Cox, 1974).

Table 8
Income Distribution for Jacksonville



Source: Haynes and Cox, 1974.

Table 9
Income Categories: Jackson County and Jacksonville

	Jackson County (1970)	Jacksonville (1973)[1]
0-$3,999	17.03%	16.1%
$4,000-%5,999	12.81%	10.5%
$6,000-$11,999	45.26%	32.7%
$12,000+	24.89%	40.8%

[1]Adjusted to 100% of those reporting income as reported by Haynes and Cox (1974).

Land Use

Present Land Use. The majority of lands in and around Jacksonville are in some form of agricultural use or are in open space. Slope requirements, drainage, and soil characteristics nevertheless keep many of these open lands from being suitable for subdivision or for recreational development (Interview: Bear Creek Valley Sanitary Authority, 1976). Land planted in crops is significant; for example, Jacksonville's environs claim nearly 3 percent of the total county lands are in crops (horticulture).

Residential areas of Jacksonville are scattered intermittently in most directions, excluding the east. The most recent annexations by the city have been to the north and northeast, but the southern and western foothills show signs of residential sprawl. The western foothill regions could sustain quite a bit more residential development before saturation occurs (Interview: Jacksonville City Engineer, 1976). The core area of the downtown portion of Jacksonville is presently reaching its saturation point as there is little or no room for growth, either in residential or commercial areas. This growth must be directed elsewhere.

Jacksonville's commercial enterprises are very small in scope and do not offer a wide variety of services to residents. As a result, most people visit Medford or other communities for commercial services (Interview: Jacksonville City Government, 1976). Jacksonville's commercial services are primarily confined to the downtown area. Large shopping centers do not exist.

Industry is very limited in Jacksonville. Table 10 illustrates a land use summary based on 1969 statistics. It should be noted that Jacksonville claims some 22 percent of its lands to be vacant.

Land outside of but adjacent to Jacksonville falls within the jurisdiction of the Jackson County Department of Planning and Development. The assistant planner for the City of Jacksonville is currently revising and updating land use policies in order to conform to the goals and guidelines of the Land Conservation and Development Commission (LCDC) as well as enacting the Citizen Involvement Program. The city assistant planner has worked periodically with county planners in Medford in an attempt to anticipate growth demands that may be placed on Jacksonville in the future.

Table 10

Jacksonville Land Use Summary
October 1969

	Acres	Percentage
Agriculture	429.63	36.25
Vacant	262.63	22.16
Residential	298.86	25.22
Trailer Park	19.57	1.65
Commercial	9.90	.83
Hotel-Motel	.00	.00
Industrial	.36	.03
Utility	.03	.01
Institutional	21.11	1.78
Public	3.56	.30
Schools	16.65	1.40
Park & Recreation	3.56	.30
Streets	119.34	10.07
Total	1,185.20	100.00

(Courtesy Jacksonville Assistant City Planner)

Roads and Highways. The City of Jacksonville is transsected by two major highways -- Highway 238 running from Medford westerly and northwesterly to Jacksonville and Grants Pass, and the South Stage Road southeast to Phoenix. Old Stage Road to Central Point is also a heavily-traveled highway.

The 1975 average daily traffic loads for various points along the Jacksonville Highway and Old Stage Road are shown in Table 11. Future highway improvements have been planned for the Jacksonville Highway because of the heavy traffic volumes within the City of Jacksonville and on the northern portion of the Jacksonville Highway to Grants Pass. The proposed Jacksonville Highway bypass north of the city would virtually eliminate through traffic in Jacksonville thereby reducing much of the present traffic congestion. The proposed routing of the bypass is shown on Figure 7.

The Oregon Department of Transportation has also proposed a highway improvement for the Grants Pass-New Hope Road section of the Jacksonville Highway. That proposed improvement will include the portion of the Jacksonville Highway from Harbeck Road in Grants Pass to the New Hope Road northwest of Jacksonville (Schwab, pers. comm.).

Parks and Recreation. Numerous state, federal and county park areas are located within a 20-mile radius of the City of Jacksonville. The Klamath Mountains to the west of Jacksonville are a popular recreation area and, as a result, the U. S. Forest Service and Bureau of Land Management maintain six picnic and campground areas.

The State of Oregon maintains three wayside and campground areas and a 2,000-acre upland game and waterfowl management area in the vicinity of Jacksonville.

Two recreational facilities are proposed for the Jacksonville area -- a recreation trail from Ashland to Jacksonville and the 380-acre county administered-Britt Botanical Garden and Arboretum on the south side of Highway 238 to the west of Jacksonville.

Solid Waste. The collection and disposal of solid waste in Jacksonville is accomplished by a franchised, commercial (private) collection service. The "City Sanitary Service" collects refuse in the communities of Jacksonville, Phoenix, Central Point, Medford and White City.

Table 11

AVERAGE DAILY TRAFFIC COUNTS FOR THE JACKSONVILLE HIGHWAY AND OLD STAGE ROAD TO CENTRAL POINT

Location	1975 ADT (Average Daily Traffic) All Vehicles
Jacksonville Highway	
West city limits of Jacksonville	3,100
0.01 mile east of Oregon Street	4,100
0.01 mile west of 5th Street	5,000
0.01 mile north of California Street	4,400
0.01 mile north of F Street	4,700
North city limits of Jacksonville	4,600
0.01 mile west of Hanley Road	4,100
0.01 mile east of Hanley Road	4,600
Old Stage Road	
0.02 mile north of Jacksonville Highway in Jacksonville	1,700
0.02 mile north of F Street	1,200
North city limits of Jacksonville	940
0.02 mile south of Old Military Road	820

Roads and Highways. The City of Jacksonville is transsected by two major highways -- Highway 238 running from Medford westerly and northwesterly to Jacksonville and Grants Pass, and the South Stage Road southeast to Phoenix. Old Stage Road to Central Point is also a heavily-traveled highway.

The 1975 average daily traffic loads for various points along the Jacksonville Highway and Old Stage Road are shown in Table 11. Future highway improvements have been planned for the Jacksonville Highway because of the heavy traffic volumes within the City of Jacksonville and on the northern portion of the Jacksonville Highway to Grants Pass. The proposed Jacksonville Highway bypass north of the city would virtually eliminate through traffic in Jacksonville thereby reducing much of the present traffic congestion. The proposed routing of the bypass is shown on Figure 7.

The Oregon Department of Transportation has also proposed a highway improvement for the Grants Pass-New Hope Road section of the Jacksonville Highway. That proposed improvement will include the portion of the Jacksonville Highway from Harbeck Road in Grants Pass to the New Hope Road northwest of Jacksonville (Schwab, pers. comm.).

Parks and Recreation. Numerous state, federal and county park areas are located within a 20-mile radius of the City of Jacksonville. The Klamath Mountains to the west of Jacksonville are a popular recreation area and, as a result, the U. S. Forest Service and Bureau of Land Management maintain six picnic and campground areas.

The State of Oregon maintains three wayside and campground areas and a 2,000-acre upland game and waterfowl management area in the vicinity of Jacksonville.

Two recreational facilities are proposed for the Jacksonville area -- a recreation trail from Ashland to Jacksonville and the 380-acre county administered-Britt Botanical Garden and Arboretum on the south side of Highway 238 to the west of Jacksonville.

Solid Waste. The collection and disposal of solid waste in Jacksonville is accomplished by a franchised, commercial (private) collection service. The "City Sanitary Service" collects refuse in the communities of Jacksonville, Phoenix, Central Point, Medford and White City.

Table 11

AVERAGE DAILY TRAFFIC COUNTS FOR THE JACKSONVILLE HIGHWAY AND OLD STAGE ROAD TO CENTRAL POINT

Location	1975 ADT (Average Daily Traffic) All Vehicles
Jacksonville Highway	
West city limits of Jacksonville	3,100
0.01 mile east of Oregon Street	4,100
0.01 mile west of 5th Street	5,000
0.01 mile north of California Street	4,400
0.01 mile north of F Street	4,700
North city limits of Jacksonville	4,600
0.01 mile west of Hanley Road	4,100
0.01 mile east of Hanley Road	4,600
Old Stage Road	
0.02 mile north of Jacksonville Highway in Jacksonville	1,700
0.02 mile north of F Street	1,200
North city limits of Jacksonville	940
0.02 mile south of Old Military Road	820

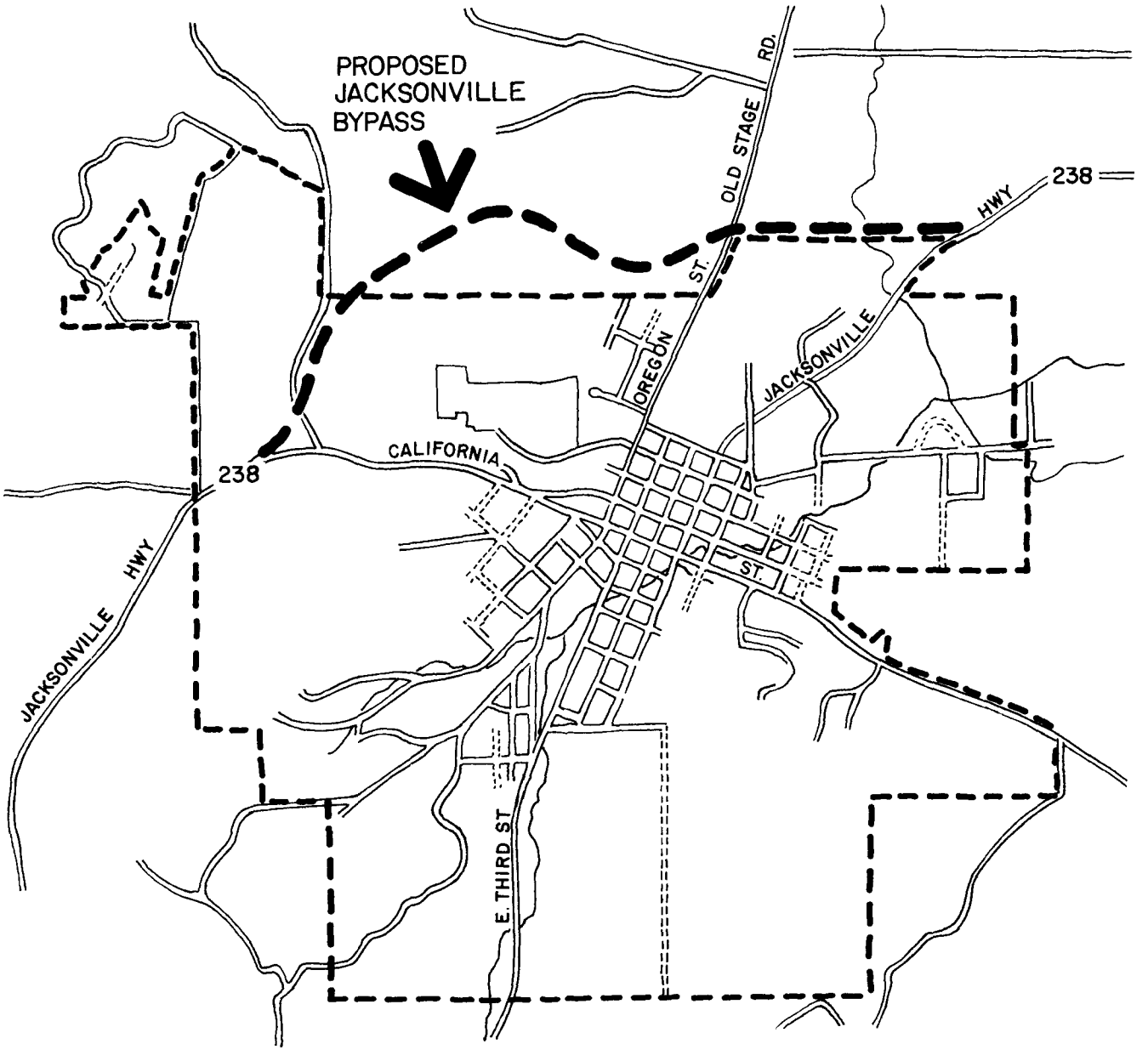


FIGURE 7 PROPOSED JACKSONVILLE BYPASS, HIGHWAY 238

A modified landfill site is located west of South Stage Road to the south of Jacksonville. This disposal site, known as the South Stage site, receives waste from the City Sanitary Service and portions of Pat's Sanitary Service in Eagle Point. In addition to the franchised use of the site, many members of the public haul and dispose of their own wastes.

The disposal site was begun in 1962 and is projected to be used until 1980.

Zoning. Present zoning classifications for the City of Jacksonville and the service area surrounding the city are presented in Figures 8 and 9. Legends pertaining to each map follow.

Future Land Use.[1/] Future use designs, constraints and needs placed upon land are becoming more and more critical as population pressures increase. These pressures occur not only because of natural increases in the birth rate, but they also stem from the whims of people who wish to migrate to what they feel are more attractive areas for either retirement or living purposes. Future land use projections thus are subject to a host of the same intervening variables that impinge upon accurate population projections. In the majority of cases, present land use patterns, practices and problems are merely intensified for the future.

Many of the concepts within the Jacksonville General Plan have not been formalized. The urban growth boundaries of the city have not been finalized along property lines. The planners and Commission are cognizant of this fact, however. Although the general plan is not intended to be a rigid instrument, its basic objective is to maintain the city's historic character while still providing a high degree of liveability for its residents (Interview: Jacksonville Assistant City Planner, 1976).

Plans are designed so that the core downtown area, or older and more congested area of the city, can maintain a certain historical and aesthetic quality. The General Plan outlines that continued care be given to this area simply for added insurance against over-development. The hillside and additional upland areas to the south and west

---

[1/] Much of this material is derived from the Jacksonville General Plan. For a more detailed description consult the General Plan.

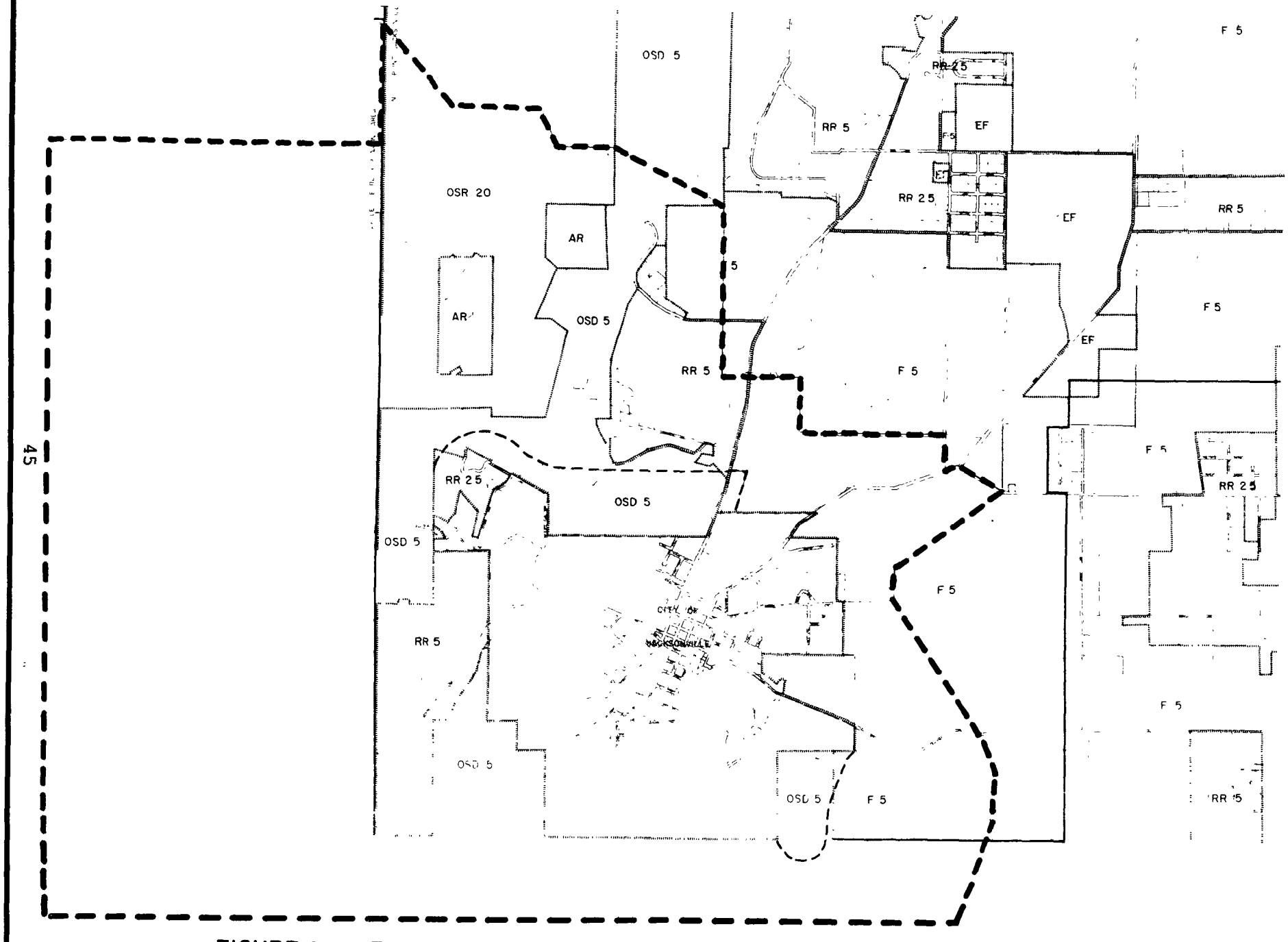


FIGURE 8 ZONING – JACKSON COUNTY AREA SURROUNDING JACKSONVILLE

LEGEND - ZONING JACKSON COUNTY AREA
SURROUNDING JACKSONVILLE

OSR-20 - Open space reserve - 1 dwelling/20 acres

AR - Aggregate resource

OSD-5 - Open space development - 1 dwelling/5 acres

RR-2.5 - Rural residential - 1 dwelling/2.5 acres

F-5 - Farm - 1 dwelling/5 acres

RR-5 - Rural residential - 1 dwelling/5 acres

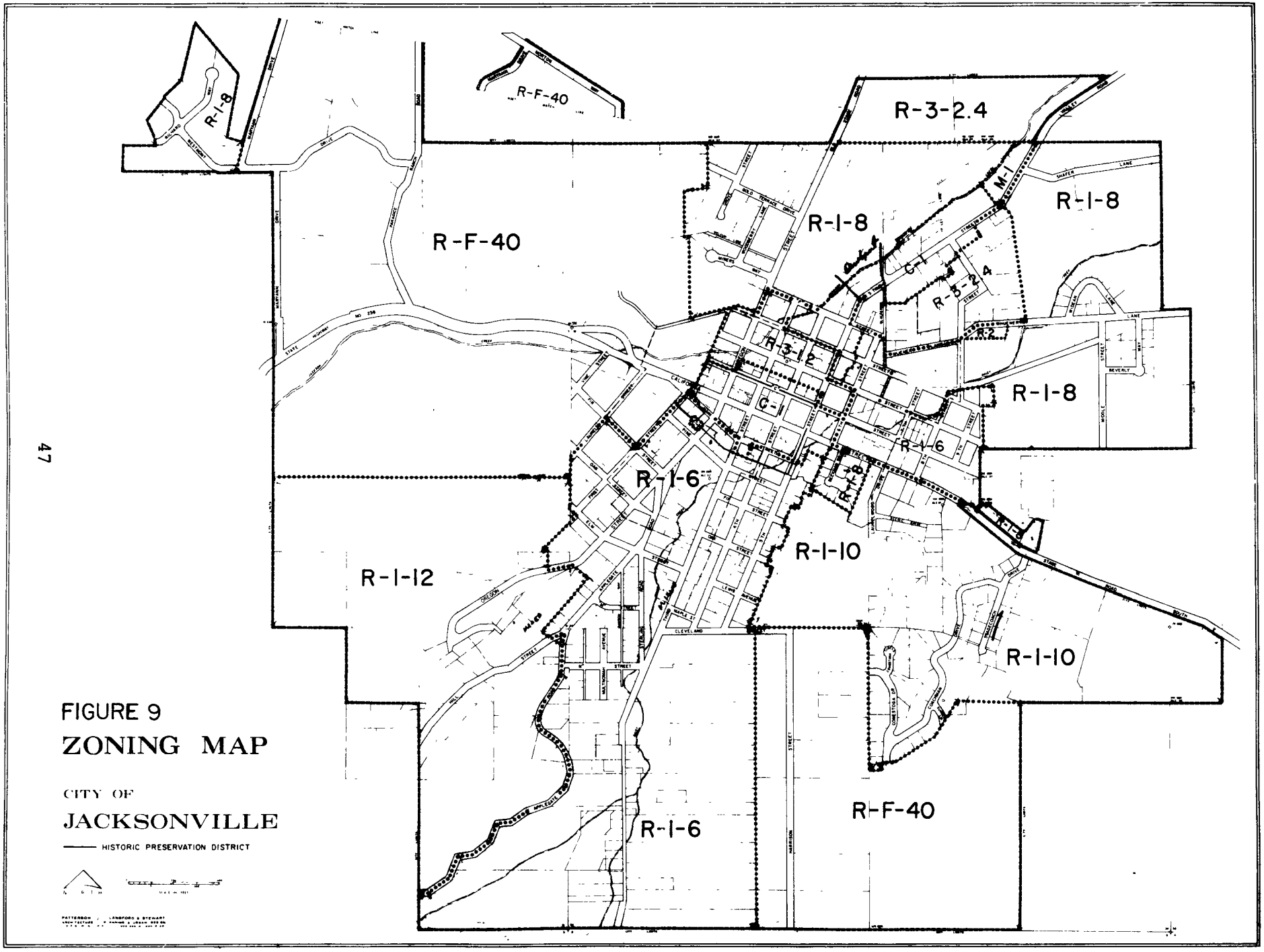


FIGURE 9

ZONING MAP

CITY OF

JACKSONVILLE

—— HISTORIC PRESERVATION DISTRICT

LEGEND TO JACKSONVILLE ZONING MAP

Zoning District	Minimum Site Area	Map Symbol and Abbreviated Designation
Residential-Farm District	20,000 sq. ft.	R-F-20
Residential-Farm District	40,000 sq. ft.	R-F-40
Residential-Single Family District	6,000 sq. ft.	R-1-6
Residential-Single Family District	8,000 sq. ft.	R-1-8
Residential-Single Family District	10,000 sq. ft.	R-1-10
Residential-Single Family District	12,000 sq. ft.	R-1-12
Residential-Two Family District	5,000 sq. ft.	R-2
Residential-Multiple Family District	1,200 sq. ft./Unit	R-3-1.2
Residential-Multiple Family District	2,400 sq. ft./Unit	R-3-2.4
Residential-Multiple Family District	3,600 sq. ft./Unit	R-3-3.6
Commercial-Retail District	----------	C-1
Commercial Service-Industrial District	----------	M-1

of the city are designated to be developed with foresight in order to maintain their scenic quality as a natural setting. Restrictions are placed on the number of roadways or streets that can be built and limits are set on the removal of natural vegetation which would promote erosion if unchecked. Most of the routine development can occur in the more level areas of the city, either outside or relatively close to the city limits. Patterns of growth could continue with a degree of continuity within these areas (cf. Jacksonville General Plan).

Another principal objective is to establish and provide residential choices for existing and future populations of Jacksonville. A summary of these recommendations is provided below:

1. Residential growth is to be encouraged only in a controlled and orderly fashion from existing areas to avoid unnecessary and costly parcelization.

2. All residential developments are to be consistent with the physical environment.

3. Ranges of densities will be provided for designated residential areas.

4. Types of residential uses will be consistent with housing densities and character.

5. Zone residential areas are to avoid the intrusion of other incompatible uses; e.g., industry.

6. Density levels should conform with topographic constraints.

Commercial areas and future developments represent a potential problem for Jacksonville in terms of its ability to maintain the historical character of the downtown area and attempt to meet the needs of its anticipated population growth. In order to accommodate any type of population growth and its demands, Jacksonville will need to significantly increase its commercial opportunities beyond those that presently exist; the alternative will be increased dependency on Medford. The city plan does not reflect the feeling that the downtown core area is an appropriate locale for commercial growth. It calls for the maintenance of small scope, tourist-oriented, commercial enterprises. The plan will call for locating other, larger enterprises such as shopping centers, to the north.

The General Plan, thus far, makes no real mention of accommodation of industrial growth -- either light or heavy types. It suggests that light industry could possibly be located in the commercial area with conditional uses.

The future demand and need for public facilities has also been identified in Jacksonville. Schools, parks, emergency support services, and other agencies and institutions will need to be expanded.

One of the city's most critical needs will be to expand its highway arterials to avoid congestion, not only from residents but also from traffic posed by tourism. This is to include not only primary thoroughfares, but those which are secondary. Expanded width and the inclusion of community sidewalks will be vital in some residential and subsequent commercial areas. Measures should be taken to make roadways as efficient as possible without detracting from appearances.

Land Use Planning

Land use planning in Jacksonville and Jackson County is undertaken by the City of Jacksonville and the county level planning authority. The local planning authorities in the State of Oregon are established by the 1973 Land Use Act. By the provisions of this act, all local city or county planning jurisdictions are required to develop and maintain comprehensive land use plans which conform with adopted statewide planning goals.

State Authority. The 1973 Land Use Act established the Oregon Land Conservation and Development Commission (LCDC). The commission consists of seven members appointed by the Governor and subject to approval by the legislature. Each commissioner is appointed to a four-year term of office but may be removed for cause by directive of the Governor. No member is allowed to serve on the commission for more than two full terms (SB 100, 1973, ORS, Ch. 197.5).

Following its creation in 1973, LCDC began the task of formulating a series of comprehensive statewide planning goals to be used in coordinating local planning efforts throughout Oregon. After conducting a series of public hearings and reviewing existing state land use planning goals, a series of 14 goals with accompanying guidelines for compliance were adopted by the commission on January 1, 1975. All local planning authorities were then directed to produce comprehensive land use plans and to submit them to LCDC by January 1, 1976, for commission review. By law, local planning authorities

who fail to meet the required deadline can have their planning responsibilities carried out for them, at local expense, by the LCDC planning staff. Those local authorities unable to meet LCDC's deadline may be allowed extensions, provided that evidence of satisfactory progress in completing their comprehensive plans is provided.

In November 1976 the City of Jacksonville requested and was granted a planning extension until January 1, 1977 and was given until January 1979 to submit a final plan to the LCDC.

The County of Jackson was also given a planning extension until January 1, 1977, with a plan due date of January 1981.

The authority of LCDC includes coordinating the statewide planning effort and granting planning and siting permits to individuals or public agencies for land use activities of statewide significance. Activities which may be of statewide significance are defined in the 1973 Land Use Act as follows: 1) the planning and siting of public transportation facilities; 2) the planning and siting of public sewerage systems, water supply systems and solid waste disposal sites and facilities; and 3) the planning and siting of public schools (Oregon statutes related to comprehensive land use planning, ORS, Ch. 197.4).

Local Planning Authority. Local planning responsibilities are undertaken by the City of Jacksonville and Jackson County.

City of Jacksonville. Planning for the City of Jacksonville is accomplished by the Planning Commission and the city planning staff. The planning staff has been working to fulfill the city's requirements for land use planning within and directly adjacent to the city limits.

County Authority. A planning commission consisting of nine members from various geographic locations in Jackson County is appointed by the County Board of Commissioners, each to serve a four-year term. The Planning Commission has authority to recommend adoption of plans and zoning ordinances in the county, while the County Board of Commissioners has the sole responsibility to adopt comprehensive land use plans and zoning ordinances for its jurisdiction. A County Planning Director is designated by the commission to oversee the operations of the Planning Department and serve as the chief administrative arm of the County Planning Commission.

At the present time, Jackson County has a comprehensive plan that was adopted by the planning commission in June 1972 and endorsed by the Board of Commissioners in July of that year. The zoning ordinance was adopted in 1973 and the Subdivision Ordinance in 1959. A revised comprehensive land use plan, as defined by SB 100, for Jackson County is not yet completed. However, it is scheduled to be finalized in January 1981.

III. ALTERNATIVE WASTEWATER TREATMENT FACILITIES

Introduction

U. S. Environmental Protection Agency rules and regulations for the preparation of an EIS (CFR, part 6) require that alternatives to a proposed project be developed, described, and objectively weighed when significant resource tradeoffs are involved. During the preparation of this draft Environmental Impact Statement (EIS), a number of alternative projects were evaluated in conjunction with the preparation of a Facilities Plan by T. Flatebo & Associates. In this draft EIS, information and data are submitted to allow an independent comparison of the environmental and financial cost differences among the available alternatives without nominating one alternative for implementation. The reasons why an alternative is selected as the best must be objectively determined and stated in detail, and the information needed for this determination will not be available until after the public hearing.

At the present time, construction within the City of Jacksonville is restricted by controls on new sewer connections issued by the State of Oregon Department of Environmental Quality. This restriction was imposed because the design capacity of the existing sewage treatment lagoons is presently being exceeded. In addition, the treatment lagoons discharge to Daisy Creek, and this is a violation of the Proposed Water Quality Management Plan, Rogue River Basin. The City of Jacksonville's existing NPDES (National Pollutant Discharge Elimination System) prohibits the direct discharge of treated wastewater to Daisy Creek after July 1, 1977.

Constraints on Alternative Development

In the conjunctive development of project alternatives, by the EIS and Facilities Planning Engineers, there were certain institutional constraints imposed upon facility selection and cost of implementation. The principal constraints influencing the development of alternatives for the City of Jacksonville are:

1. PL 92-500 - Federal Water Pollution Control Act Amendments of 1972.

2. EPA Secondary Treatment Information, Federal Register, Vol. 38, No. 1959, August 17, 1973.

3. EPA Cost-Effectiveness Analysis Guidelines, Federal Register, Vol. 39, No. 29, February 11, 1974.

4. Oregon State Department of Environmental Quality, Water Quality Standards.

5. Oregon State Department of Environmental Quality and EPA, National Pollutant Discharge Elimination System (NPDES) Permit.

Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, assigns EPA responsibility for the establishment of waste discharge criteria for all federally-funded wastewater treatment facilities. In addition, PL 92-500 provides three dates by which wastewater treatment facilities must meet certain effluent quality criteria. By July 1, 1977, all municipal treatment facilities should be capable of producing an effluent which meets EPA secondary treatment requirements. By July 1, 1983, all municipal treatment facilities should be providing treatment to a level referred to as "Best Practicable Waste Treatment Technology" (BPWTT). An EPA goal is that by July 1, 1985, municipal wastewater treatment facilities will reach a condition of zero discharge of pollutants. Although this latter requirement is generally undefined and the nature of any future actions uncertain, the general definition of pollutant should be considered as any material in a discharge which adversely affects the beneficial uses of receiving water.

The EPA "Secondary Treatment Information" defines effluent quality requirements for achieving secondary treatment and thus compliance with PL 92-500. The requirements for secondary treatment stipulate effluent concentration limits for biological oxygen demand, suspended solids and pH. The secondary treatment definition was recently revised to exclude fecal coliform bacteria limits (Federal Register, Vol. 41).

The EPA "Cost-Effectiveness Analysis Guidelines" provide a uniform method for calculating the cost of wastewater treatment projects, and they have been used as a portion of the cost evaluation in this EIS. These guidelines delineate the planning period to be utilized in the alternative evaluations, the elements of cost which must be included, the method of handling prices for various components of the system, the interest rate which must be utilized, the service life of various facilities, and salvage value to be utilized for the proposed works. The guidelines provide a uniform method for comparing the cost of various alternatives for a given project, as well as the cost of any given project in the state. Therefore, while the monetary costs developed in the Cost-Effectiveness Guidelines may not always represent the "true cost" of a project, they do approximate the cost and present a uniform method for comparing alternative projects.

The Oregon State Department of Environmental Quality (DEQ) has established minimum water quality requirements for receiving waters of the state. These criteria are contained in Section 11--010 of OAR Chapter 334, and they state, in general, that the highest and best wastewater treatment should be provided and that the control of waste discharge shall in every case be the best practical method. In February 1976, the DEQ completed a Proposed Water Quality Management Plan, Rogue River Basin, to comply with EPA requirements (PL 92-500, 303) for performing comprehensive basin planning for all river basins in the state. This document summarized and discussed existing water quality data, water quality standards, and nutrient problems, among other subjects. The only discussion of alternative projects pertained to past reports and no attempt was made to develop any new alternative.

The Oregon State Department of Environmental Quality and the EPA must review and certify all NPDES permits for wastewater discharge. The purpose of an NPDES permit is to establish specific effluent and receiving water quality requirements which must be met by a treatment plant facility. In formulating alternatives, only those that will meet the probable NPDES requirements are considered feasible. It should be noted that each wastewater discharger must possess a NPDES permit prior to discharge, and each permit is prepared to respond to the particular discharge situation.

Regionalization

The objective of a regionalized system is to provide the most cost-effective method for collection, treatment, and disposal of wastewater. It should be understood that regionalization does not imply or require that only one treatment facility be utilized, or that an entire area must be sewered, but rather that planning must be done for an entire region, and not on a piece-meal basis. The term "cost-effectiveness" comprises three very important costs: monetary or dollar costs, environmental costs, and social costs. One other equally important factor in considering alternatives is that of meeting federal and state water quality standards and treatment requirements. Within this chapter, only monetary costs are considered since subsequent chapters describe the environmental and social impacts of the project alternatives. Typically, environmental and social costs are not monetary but judgmental. The cost-effective project is that project which is judged to have the lowest overall monetary, social and environmental cost.

Several advantages can be obtained by regionalization -- economy of scale in construction, operation and maintenance, wider distribution of costs, one operating authority for treatment facilities, treatment process efficiency control, easier inclusion of new residential and commercial developments into the system, and ability to plan for a basin or area as a whole. The principal disadvantage of regionalization is that local governments or agencies often must enter into joint powers or other agreements that extend local responsibilities beyond individual member control. Regionalization in this case encompasses relationships between the City of Jacksonville and the Bear Creek Valley Sanitary Authority.

Flow and Waste Reduction Measures

At the present time, overall water consumption within the city is about 180 gpcd (gallons per capita per day). Thus, average water consumption is somewhat less than the national average, which is about 200 gpcd. A typical trend in non-industrial areas is for about one half of the water purchased to be utilized outdoors for lawn and garden irrigation, car washing, and other uses. The remaining half is utilized indoors, mostly nonconsumptively, and on a national average results in a sewage generation rate of 90-100 gpcd. Records for the City of Jacksonville indicate that summer wastewater flows average about 80 gpcd, or somewhat less than the national average, even though this is the peak tourist season.

During the winter months the average per capita flow is about 135 gpcd, indicating that the sewerage system is accruing additional flow called infiltration/inflow. Infiltration is characterized by seepage of groundwater into pipes due to poor joint construction, cracked pipes or joints, whereas inflow enters through manhole covers, ground drains and house roof drains connected to the sewer. Infiltration/inflow is typically highest during the rainy season, and infiltration is greatest during high groundwater conditions. The quantity of infiltration/inflow depends to a large extent on the size of the sewer system, the "tightness" of the collection system, and whether roof drains are connected to the sewer system.

For the Jacksonville system, it would be anticipated that once the excessive infiltration-inflow is corrected, the overall quantity should fall in the general range of 10-20 gpcd, making the average winter wastewater production about 100 gpcd, not the 135 gpcd calculated.

Rather than comparing on a per capita basis, another method is to compare average daily summer and winter flows. This information is presented in the following table for years 1973, 1974, and 1975. The summer months are May through September and winter months are January through April and October through December.

Year	Summer		Winter		Percent Increase of Average Daily Winter Flow Over Summer Flow
	Average Daily Flow, Gallons/Day	Total Rainfall, Inches	Average Daily Flow, Gallons/Day	Total Rainfall, Inches	
1973	112,477	1.22	138,165	17.68	22.8
1974	120,261	0.32	187,396	18.77	55.8
1975	131,712	2.03	180,401	12.73	37.0
Average of 1973-1975	121,483	1.19	168,654	16.39	38.8

As shown, an average increase of winter flow over a summer flow of 38.8 percent occurred over a 3-year period.

The City Engineer has indicated that all of the existing collection system was installed in 1964 under one contract, and that all joints in the collection system are tight. Flow measurements taken during the winter of 1975-1976 at 10 key manholes located throughout the city indicated flow increases between wet and dry winter conditions (rainy vs. dry) of anywhere between 130 percent and 400 percent. Since that time more than 12 manhole covers have been raised, which will probably lessen the quantity of inflow during the winter of 1976-1977. In addition, the City of Jacksonville is initiating an analysis to determine sources of infiltration and inflow.

Based upon summer month water usage, it appears that water conservation measures to reduce sewage flow are not an issue because both water use and wastewater production are below the national average. The high rate of infiltration/inflow may require that remedial measures be taken.

Wastewater Management Options

Possible Alternatives

During the preliminary analysis of wastewater treatment/disposal alternatives a wide range of wastewater management alternatives were considered. Of these alternatives some were identified as being non-viable and were eliminated from further consideration in the Facilities Plan. The alternative concepts that were screened out initially and the reasons for doing so follow:

1. Local Orchard Irrigation. A requirement of EPA's Construction Grants Program is that land application of treated effluent must be considered as one means of meeting the 1983 and 1985 goals of PL 92-500. Use of reclaimed water for orchard irrigation initially appeared desirable primarily because many existing orchards could use additional water supplies, and also because there are many potentially farmable parcels of land which do not now have sufficient water for such a purpose.

The use of treated wastewater for orchard irrigation was dismissed because of the method of irrigation presently utilized. When orchards are irrigated, there is no control of the tailwater (runoff). Any resulting tailwater is simply discharged into nearby creeks, which then carry it to the next lower elevation irrigation canal. While this practice is now considered acceptable, it would not be acceptable if reclaimed water were used for irrigation. The principal reason this practice is not accepted relates to public health considerations and the inability of the city to control the ultimate destiny of the water initially used for orchard irrigation.

2. Percolation Pond Disposal. In many parts of the western United States treated wastewater is percolated to groundwater basins, a practice which not only results in a low cost method of disposal, but also beneficially recharges the groundwater basin in a majority of situations. For percolation ponds to perform satisfactorily, the soil must be of a relatively high permeability and the depth to the groundwater table should be in the range of 15 to 20 feet. Although the soil in the general vicinity of the treatment facility is marginally suitable for percolation, the shallow depth to groundwater was the principal reason for dismissing this alternative from further consideration. In much of the area near the existing lagoons, the depth to groundwater is so shallow that alfalfa can be grown without surface irrigation. In order to gain a greater depth to groundwater, a pond would have to be located at a higher elevation than the valley floor, and in these areas, rocky, impermeable strata are found beneath the overlying alluvium. Thus, there was no general area determined suitable for percolation ponds.

3. Direct Creek Discharge. Under certain conditions, an acceptable form of effluent disposal is by direct discharge to a water course. An important criterion in permitting such discharge is the amount of dilution which is afforded by the water course. In some situations, if sufficient dilution is not available, direct discharge may still be suitable if a high quality effluent is produced, and then filtered prior to

discharge. In the case of the City of Jacksonville, any direct discharge would be to Daisy Creek, which, although it probably provides sufficient dilution during the winter months, is essentially dry during the summer months if no wastewater is discharged.

The screening out of this alternative disposal concept was based primarily upon probable adverse public health situations which could be expected in the urbanizing area downstream of the probable discharge location. In addition, such a discharge would violate both the Basin Water Quality Control Plan and the city's present NPDES permit.

4. Evaporation. Although normally not a beneficial use of a water resource, it is possible to evaporate treated wastewater as a method of disposal. This concept was screened from further consideration because of the relatively large area of land required. Using an average annual evaporation rate of 35 inches and an average annual precipitation rate of 20 inches, a required evaporation surface area of 357 acres would be required in 1996. Since roughly 5 percent of additional land area would be required for dikes, an estimated 375 acres would be required. Since the only feasible location for ponds of this magnitude would be the flat valley floor, the majority of which is Class 1 farmland, the concept was eliminated from further consideration.

Treatment and Disposal Alternatives

Each of the treatment and disposal concepts, considered feasible after the initial technical and environmental screening, is briefly described to acquaint the reader with their general characteristics. The two processes which will be considered are activated sludge and aerated lagoon treatments. Two separate disposal alternatives considered are land application for beneficial use of reclaimed water and land application solely as a form of effluent disposal.

The Activated Sludge Process

Activated sludge treatment uses bacteria to decompose the organic matter in sewage (Figure 10). During this process the bacteria convert the organic matter into more bacteria, i.e., multiply in number and mass, and some mass must be removed from the process in a form called sludge. Following removal from the liquid portion of the process, sludge is first treated by maintaining it for a lengthy period without a food supply in order to reduce its volume; it is then de-watered using a sand drying bed and, when dry, transported to a disposal area.

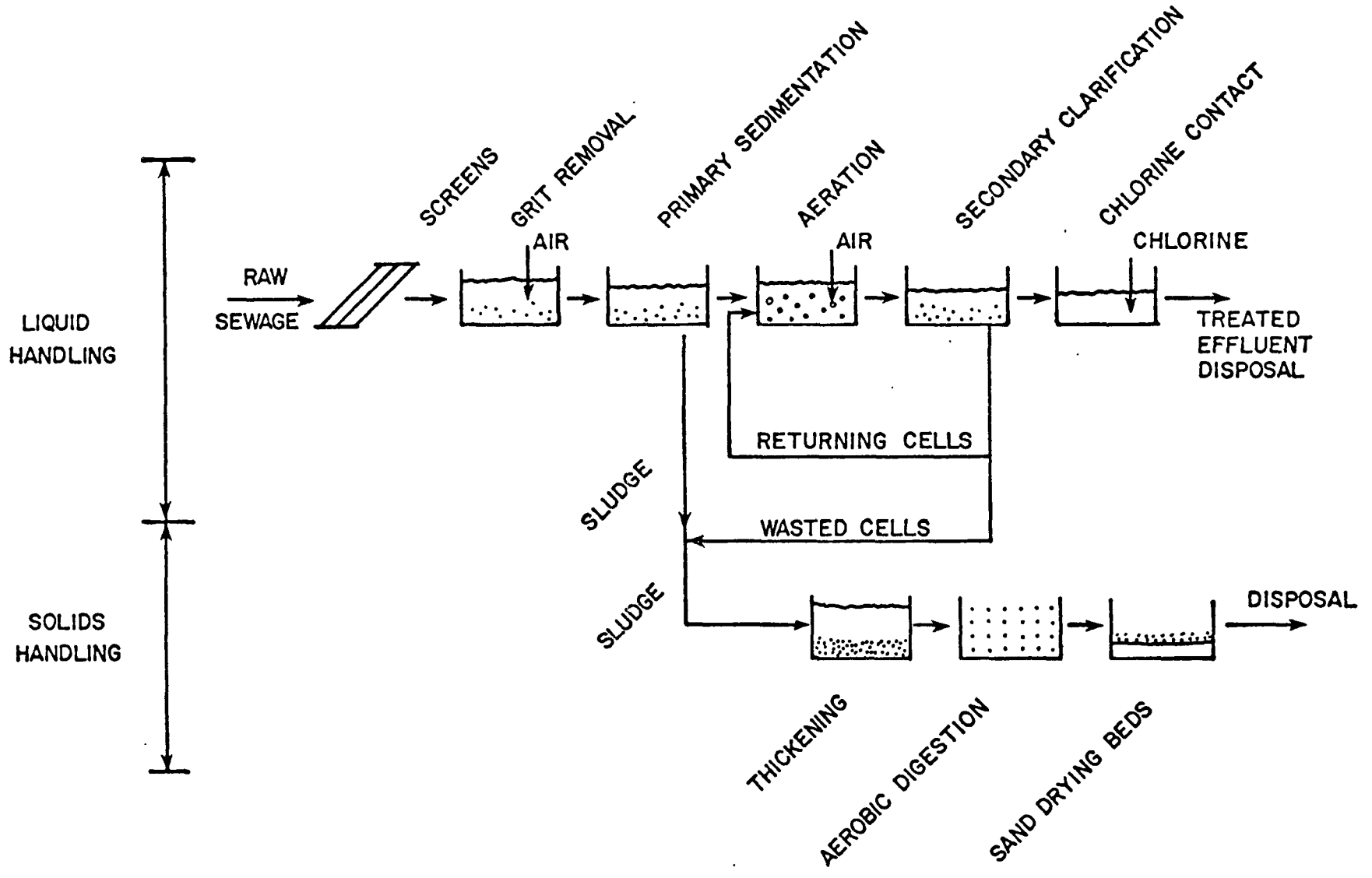


FIGURE 10: PICTORIAL FLOW DIAGRAM OF ACTIVATED SLUDGE TREATMENT

The Aerated Lagoon Process

This treatment process consists of using two separate ponds, one for aeration and one for sedimentation (Figure 11). In the aeration pond, which has floating mechanical aerators driven by electric motors, bacteria grow and convert organic matter to more bacteria, as in the activated sludge process. The second pond is required for sedimentation of suspended bacteria and further stabilization of wastewater by algae. Sludge must not be removed from the process, as it is all biologically destroyed due to the relatively long detention time. Occasionally, once every ten to twenty years, the lagoons must be dewatered to remove an accumulation of grit and humus soil.

Land Application for Beneficial Use or Disposal

Treated effluent, from either the activated sludge or the aerated lagoon processes, can be applied to land for beneficial use or disposal. The method of application is essentially dependent on the ultimate objective as well as physical and biological factors involved. Three basic land application approaches have been set forth by EPA (1973) -- irrigation, overland flow and infiltration-percolation.

Irrigation. This is the most widely used type of land application in the United States. There are three basic methods of effluent irrigation -- spray, ridge and furrow and flood. The type of irrigation system to use depends upon soil drainability, topography, economics and the crop involved (Environmental Protection Agency, 1973). For crops which are utilized directly by the consumer without intermediate processing, public health considerations preclude use of sprinkler application or any method where direct contact is possible with the edible portion of the crop. Many studies have been conducted by the State of California relative to the possible airborne transmission of pathogens or virus by sprinkler application, and these studies indicate such transmission to be possible only within a very short distance. Prevention of public health problems is accomplished by providing a buffer zone, fencing and by excluding the public from contact areas.

Overland Flow. This method of disposal consists of flowing wastewater over land having limited drainability and a slope of 2 to 6 percent. The wastewater is utilized by vegetation and some evaporation and percolation occurs; however, because of runoff the remaining wastewater must be discharged by another means. Because of the limited permeability of the soil, groundwater will not be affected by this method (Environmental Protection Agency, 1973).

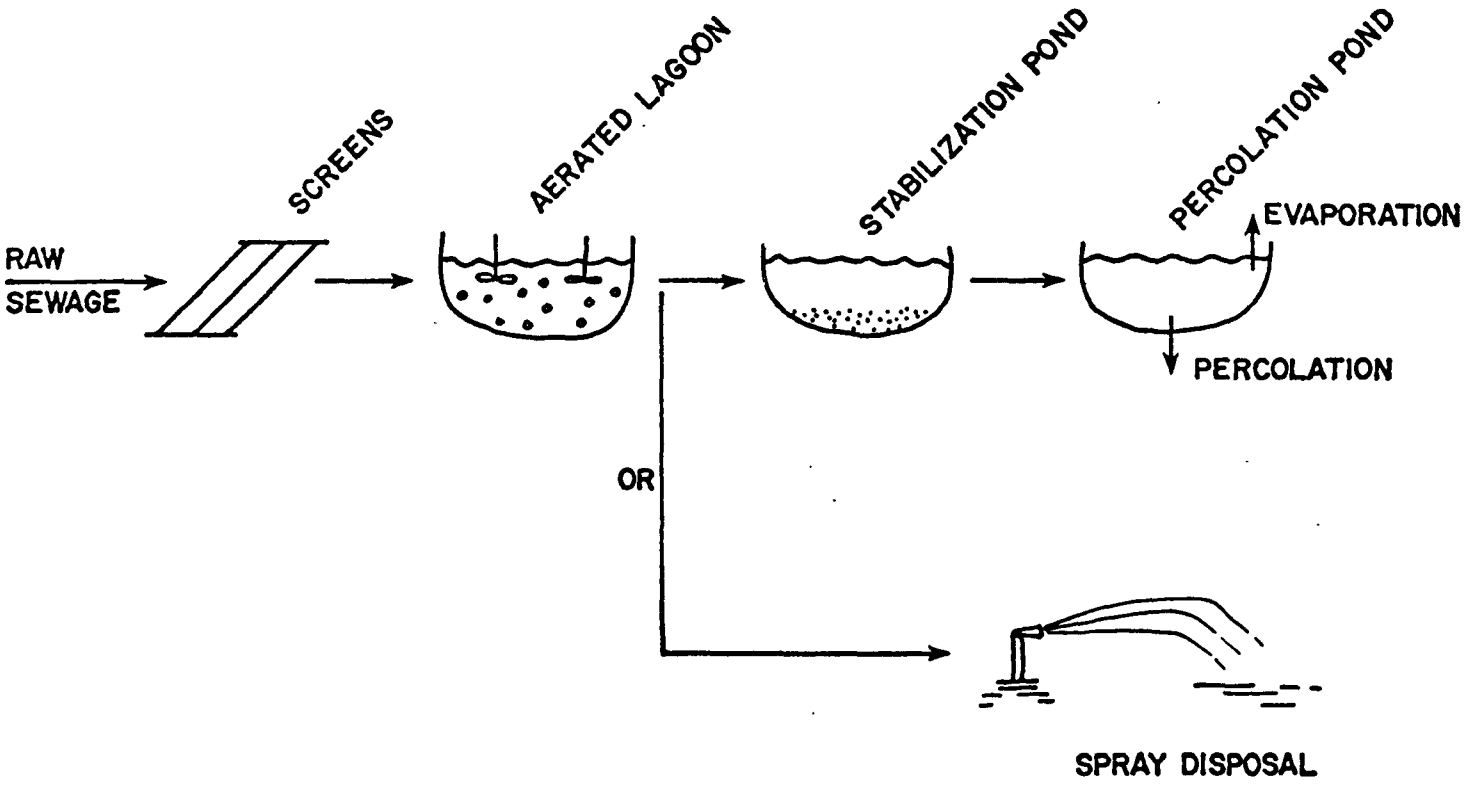


FIGURE 11: PICTORIAL FLOW DIAGRAM OF AERATED LAGOON TREATMENT

Infiltration-Percolation. With this method of application, wastewater may be applied either by spreading or spraying. Because effluent can infiltrate at a high rate, less land is required for the same volume than for the two other alternatives (Environmental Protection Agency, 1975). The rate of application is governed only by the ability of the soil to evaporate/percolate the effluent. Land used for a pure disposal application is normally marginal land, and quite often is land which is too hilly or remote for other uses. Most water is lost through percolation and evaporation.

Treatment Plant Site Options

Should the City of Jacksonville proceed independently of the Bear Creek Valley Sanitary Authority (BCVSA), there is only one location considered feasible for a treatment facility. This is the location of the City of Jacksonville's existing treatment facility, which is located south of the Jacksonville Highway, about 1,600 feet west of its intersection with Hanley Road and north of Daisy Creek.

Should Jacksonville participate with BCVSA by either lease or annexation, the treatment facility would be the existing City of Medford treatment plant which is located near White City and discharges directly to the Rogue River.

Land Application Site Options

Three site options are considered feasible for land application, two for beneficial use application and one for disposal application. One beneficial application site is owned by the U. S. Forest Service, which is in the process of developing a seedling farm. This site occupies an area of about 250 acres and is located on the general northwest corner of Hanley Road and Ross Lane. The Hopkins Canal forms the northeast boundary. This site is presently used for cattle pasturage.

Another site for possible beneficial application is a 77-acre parcel of land immediately across Daisy Creek and southeast of the existing City of Jacksonville treatment facility. If this site were utilized, it would be used to grow alfalfa under a controlled irrigation program operated by the city. The site is presently utilized to grow alfalfa.

The only feasible site selected for application solely for disposal is an 80-acre parcel located above and southwest of the existing county landfill. This site is vegetated with a mix of oaks, fir and pine.

Sludge Disposal Options

The disposal of sewage sludge is necessary whenever activated sludge wastewater treatment is employed. A number of options are possible for the alternatives requiring sludge disposal.

Direct Land Disposal. This option would involve disposing sludge directly onto a land area. The sludge is usually plowed under when dried. Land disposal would be suitable for alternatives involving activated sludge treatment.

Incineration. Sludge incineration is a means of reducing the volume of sewage sludge to an ash or small volume of sludge. The residue must ultimately be disposed of in a landfill or onto farmland. There are several methods of incineration -- multiple hearth, flash-drying and fluidized bed. With adequate dewatering (to approximately 30 percent solids) the process can be self-sustaining, without the need for supplemental fuel except for warmup and heat control (Metcalf and Eddy, Inc., 1972). When using raw sludge in a multiple hearth or fluidized bed system, the heat necessary for incineration can be obtained from combustion of volatile matter in the sludge.

Landfill Disposal. A sanitary landfill can be used for the disposal of stabilized or unstabilized sludge. The most likely location would be at the South Stage site south of Jacksonville. That site is approximately 2 miles from the existing sewage lagoons.

Sludge Dewatering and Drying. The most commonly used method is to spread wet sludge on a bed for drying. The dried sludge is transported to a farmland disposal site, landfill site, or is made available to the public for use in gardens and flowerbeds. Drying beds are now utilized at the regional treatment plant.

Implementation Options -- Financing and Organization

A variety of facilities may be required for implementation of the alternative projects: a wastewater treatment facility, an outfall to land application sites, land application sites, an interceptor sewer, and pumping stations. The questions listed below may be as important to some city residents as the technical and environmental aspects of the project.

1. How will new facilities be paid for?

2. How will the cost of required facilities be allocated to residents within the city?

3. How will the facilities be operated?

There are various ways to accomplish the above actions, and they should be dealt with in detail before a project becomes operational. These subjects are discussed at a general level of detail in the following text and should be kept in mind while reviewing the alternatives and their environmental and social impacts.

First, how will the facilities be paid for? This project, as a part of EPA's Construction Grants Program, is eligible for 75 percent federal funding of treatment facilities, pumping stations and interceptor pipelines. The remaining 25 percent is the local share and would have to be paid for by the city. It should also be noted that land and right-of-way purchase is not an eligible cost and would not be paid for with EPA grant funds.

The 25 percent local share of treatment, interceptor, and pumping facilities will probably be financed by general obligation bonds sold by the city, bonds which would be repaid by money collected from ad valorem (property) taxes, and possibly a portion of the monthly sewer service charge. Usually, however, a lower interest rate can be obtained if the bonds are repaid by only ad valorem taxation and this is a commonly followed procedure. General obligation bonds must be approved by voters within the city and are limited by Oregon State Statute to 13 percent of the assessed valuation of the city.

Secondly, how will the cost of required facilities be allocated? As discussed, the 25 percent local share of treatment, outfall, interceptor, and pumping facilities is generally paid for by ad valorem taxes and this would be allocated according to the assessed valuation of the property in the city. Allocation of operation/maintenance costs would be governed by Federal Guidelines for Revenue and Repayment programs, but since Jacksonville has no major industry, they would most likely be allocated uniformly on a per connection basis.

Thirdly, how would the various proposed facilities be operated? Should either lease or annexation to BCVSA be selected, BCVSA would assume responsibility for operation/maintenance of all new facilities constructed as a part of this project and, in the case of annexation, would include operation of

Jacksonville's collection system. Should facilities be constructed to serve only Jacksonville, the facilities would be operated by the city, requiring at least one full-time operator and probably one part-time operator. The city would also be responsible for the operation of all land application areas, except the alternative using the U. S. Forest Service seedling farm. At this site the Forest Service would take delivery of the effluent and assume the operating responsibility.

Existing Wastewater Treatment Facilities

The City of Jacksonville presently owns and operates an existing stabilization pond treatment facility. This facility consists of two ponds which are operated in series, the total surface area of the ponds being about 9 acres. Prior to discharge to Daisy Creek chlorine is added to the pond effluent in order to provide disinfection. This treatment facility was constructed in 1963 in conjunction with the sanitary sewer system and payments will be required on the bonds until 1987.

The Bear Creek Valley Sanitary Authority provides sewerage service to a 220-square mile service authority. The sewage is treated at the 10 mgd Medford treatment plant. This plant operates using the activated sludge process, and discharge is to the Rogue River. It is anticipated that this plant will be expanded to 20 mgd in 1977 and 30 mgd in 1985.

Population Capacity of Project Facilities

For purposes of sizing the various project facilities, two population projections were utilized.

Alternatives A-1 and A-2. For alternatives which discharge to the BCVSA (Alternatives A-1 and A-2), the required interceptor extension of the West Medford Trunk from its present terminus at Pioneer Avenue and the Jacksonville Highway would be sized not only for Jacksonville, but also for those areas that are presently within BCVSA that drain naturally toward the Pioneer Avenue terminus. Although the interceptor would be sized greater than required for Jacksonville alone, Jacksonville would pay only for a pro rata share based on flow if the project selected is for Jacksonville to lease capacity from BCVSA. Based on 100 gpcd and a peaking factor of 2.5, the 24-inch interceptor is sized for an estimated design flow of 5.24 mgd, which is expected to provide capacity for 20,943 people. The 15-inch portion of the interceptor will have a design flow of 2.13 mgd.

The peaking factor is based on the projected highest instantaneous flow for the sewerage system. Interceptor systems must be designed to handle the peak load flows (which usually occur in the morning and in the evening) rather than the average flow.

Alternatives B, C-1 and C-2. For those alternatives that provide capacity for only the City of Jacksonville the various project facilities will be sized on the basis of a projected 7 percent growth. Based on a 7 percent growth, the 1997 population would be 5,300.

Facilities are projected to be sized as follows:

Facility	Sized to serve needs until year
Interceptors	2027
Pumping stations	
Wet wells	2027
Pumps	1997
Treatment facilities	1997
Outfalls	2027
Land application sites	1997

These facility components are planned to provide capacity for the projected population until the year shown above. For pumps, treatment facilities, and land application sites, a 1997 population of 5,300 people could be accommodated. For interceptors, outfalls, and pumping station wet wells, a 2027 population of approximately 9,500 could be accommodated.

Alternative C-1a (no growth). This alternative will have facilities designed to support the 1975 Jacksonville population of 2,070. The aerated lagoons will have a design capacity of 0.25 mgd, which based on 100 gallons of wastewater per capita per day could support a population of 2,500 or approximately 430 more than the 1975 population.

Theoretically, if no further population growth occurs within the city, the facilities could serve the needs of Jacksonville for an indefinite time period.

Description of Evaluated Regional Treatment and Disposal Alternatives

Alternative A-1 - Bear Creek Valley Sanitary Authority Annexation (BCVSA)

Using this alternative, the City of Jacksonville would annex to the BCVSA. BCVSA would extend the West Medford Trunk to connect to the headworks of the existing Jacksonville sewerage system. The existing lagoons would be removed, the land regraded to its original form and probably sold. Extension of the West Medford Trunk from its present terminus at Pioneer Avenue and Jacksonville Highway would require 4,800 feet of 18- and 24-inch pipe and 2,400 feet of 15-inch pipe. The probable alignment of the West Medford Trunk extension and the location of the existing BCVSA facilities which would be utilized are shown on Figure 12.

The capacity of this new pipeline would be 2.13 mgd in the 15-inch section where it connects to the existing Jacksonville system and 5.24 mgd in the 24-inch section where it would connect to the existing West Medford trunk at Pioneer Avenue.

At a flow generation rate of 100 gpcd this pipeline could serve 8,533 people where it connects to the Jacksonville system and 20,943 people where it connects to the existing West Medford trunk.

The capital costs of implementing Alternative A-1, assuming construction begins in 1977, are estimated to be $735,000, as shown in Table 12. The average annual operation/maintenance costs are $77,900, which would be collected directly by BCVSA at a rate of $3.80 per connection per month.

Alternative A-2 - Bear Creek Valley Sanitary Authority Lease

In this alternative, the City of Jacksonville would contribute raw sewage to the BCVSA system, as in Alternative A-1, but the city would not be a member of BCVSA. The city would be required to purchase capacity in the existing Bear Creek interceptor and share in the construction costs of the West Medford Trunk extension. The existing lagoon treatment facility would be abandoned, the site regraded and the land would be sold.

The differences between a lease arrangement and annexation to BCVSA relate not only to the methods used for payment of capital and annual costs, but also to maintenance of the Jacksonville sewerage collection system. Relative to capital cost differences in a lease arrangement, capacity purchase

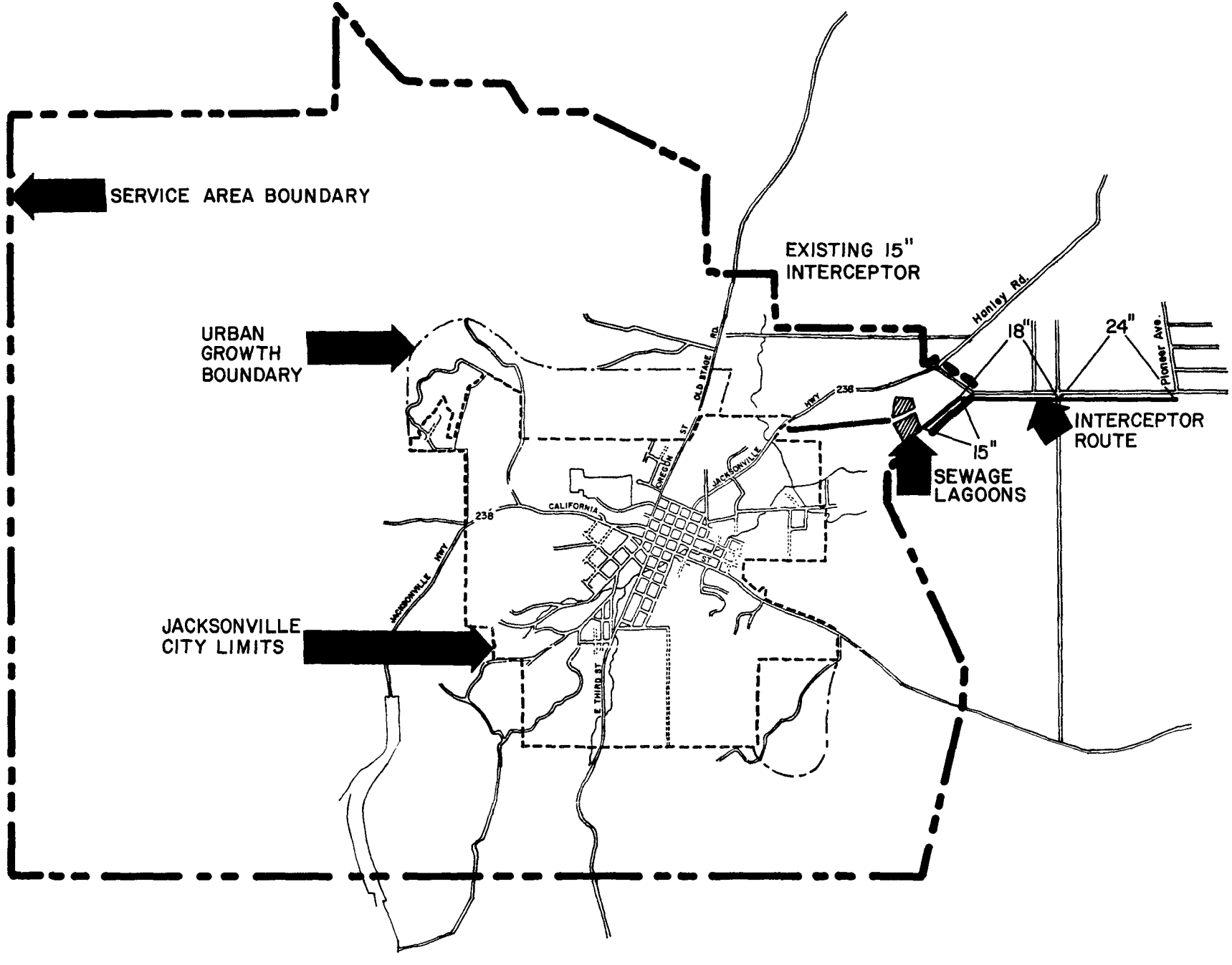


Figure 12 Service Area and Routing of Interceptors for Alternatives A-1 and A-2 (Annexation or Lease with BCVSA)

Table 12

Alternative A-1
Bear Creek Valley Sanitary Authority Annexation

Item	Cost Dollars[1]	Life, Years	Salvage Value, Dollars
Capacity purchase in Bear Creek interceptor	102,000	50	61,200
West Medford Trunk extension	476,000[2]	50	285,600
Abandonment of existing treatment facility	10,000	--	42,500
Total construction cost	588,000		
Salvage value at year 20			346,800
Existing site - salvage value			42,500
Contingencies and engineering, 25 percent	147,000		
Total capital cost	735,000		
Annual operation and maintenance cost	77,900		

[1] Costs above do not include $40,200 bond payoff on existing lagoon system.
[2] This is the City of Jacksonville's pro rata share of a total estimated construction cost of $600,000.

in the Bear Creek interceptor would have to be paid in a lump sum, rather than on a larger term annual payment method. Operation/maintenance costs in a lease arrangement must be paid to BCVSA monthly by the City of Jacksonville, while, if Jacksonville annexed, these costs would be included in BCVSA's monthly user charge, which would be collected by BCVSA directly from the user. Another difference concerns maintenance of Jacksonville's existing collection system, which would be done by the city in a lease situation; it would be done by BCVSA if the city is annexed to BCVSA and the cost would be included in the BCVSA monthly charge.

The capital costs of lease or annexation are the same, $735,000, as shown on Table 13. Average annual costs are estimated to be $75,000, and would be collected by the city as a monthly charge.

Alternative B - Local Treatment and Use of Reclaimed Water by U. S. Forest Service

In this alternative the City of Jacksonville would install a package activated sludge treatment plant at the site of the existing treatment lagoons. Effluent from the treatment plant would be stored at the plant site until required for use at the U. S. Forest Service seedling farm. An estimated 9 acres of storage pond having an initial storage volume of 29 mg would be required. This would be accomplished by use of the two existing lagoons. To meet 1997 quantity requirements 24 acres of storage ponds having a storage capacity of 77 mg would be needed. To accomplish this, additional storage ponds having a surface area of 15 acres would be constructed.

Treated and chlorinated effluent will be delivered to the seedling farm by gravity, using 11,200 feet of 12-inch diameter pipe. The Forest Service has indicated that water could be utilized at a rate of 750,000 gallons per day between June 1 and October 1, and at occasional rates as high as 3.4 mgd when it is used for frost protection during the fall and spring.

The Forest Service has indicated that the seedling farm will be completed by 1978. The farm irrigation method is expected to be spray irrigation, and the percolating water will be collected by tile underdrains located at an approximate depth of 6 to 8 feet. Most of the water volume collected by the tile underdrains would be reused in order to lessen overall water requirements, but some of the water would have to be discharged to a nearby creek to prevent salt buildup within the system.

Table 13

Alternative A-2
Bear Creek Valley Sanitary Authority Lease

Item	Cost, Dollars[1]	Life, Years	Salvage Value, Dollars
Capacity purchase in Bear Creek interceptor	102,000	50	61,200
West Medford Trunk extension[2]	476,000	50	285,600
Abandonment of existing treatment facility	10,000	0	42,500
Total construction cost	588,000		
Salvage value at year 20			346,800
Existing site			42,500
Contingencies and engineering, 25 percent	147,000		
Total capital	735,000		
Annual operation and maintenance cost[3]	75,000		

[1] Costs above do not include $40,200 bond payoff on existing lagoon system.

[2] This is the City of Jacksonville's pro rata share of a total estimated construction cost of $600,000.

[3] Breakdown of operation and maintenance costs is as follows: Bear Creek interceptor, $500/year; West Medford Trunk, $11,400/year; Kirtland pump station, $10,500/year; treatment, $31,700/year; and Jacksonville sewer system, $20,900/year.

The Forest Service has indicated a desire for the highest quality reclaimed water available, and this is the principal reason for selecting an activated sludge plant rather than using aerated lagoon treatment. Tests are presently being conducted by the Forest Service to determine the compatibility of wastewater from the existing lagoons with requirements of a seedling farm. Although results are not available, no problems are anticipated because the wastewater originates entirely from domestic and commercial activities and there is no industrial influence.

Sludge disposal would consist of drying liquid sludge on a drying bed and transporting dried sludge to the sanitary landfill site south of Jacksonville or by making the sludge available for public use.

The capital cost of implementing Alternative B, assuming construction begins in 1977, is estimated to be $730,000 as shown on Table 14. The average annual operation/maintenance costs are expected to be $35,400. Figure 13 shows the location of facilities which would be required to implement Alternative B.

Alternative C-1 - Aerated Lagoons with Adjacent Agricultural Use

In this alternative an aerated lagoon would be constructed at the existing plant site, and the existing lagoons would be converted to storage/stabilization ponds. Effluent from these storage ponds would be utilized to irrigate alfalfa grown on a 77-acre site just across Daisy Creek to the south of the treatment plant site. Figure 11 shows the location of the required facilities.

The aerated lagoon to be constructed would have a surface area of 0.8 acre. No sludge would be created in the process, although the aerated lagoons and the storage ponds may have to be cleaned every 10-20 years. The reclaimed water used to irrigate the alfalfa would be applied by sprinkler irrigation, and provision would be made to prevent any tailwater runoff from the site by returning any potential runoff back to the storage lagoons. Wells would be installed to monitor the groundwater level under the irrigation area. The city would operate the entire system, but would contract for harvesting of the alfalfa.

Because satisfactory effluent quality could be achieved using aerated lagoons, activated sludge treatment was not considered in this alternative. In addition, the cost of using an activated sludge treatment would be considerably greater than would the use of aerated lagoons.

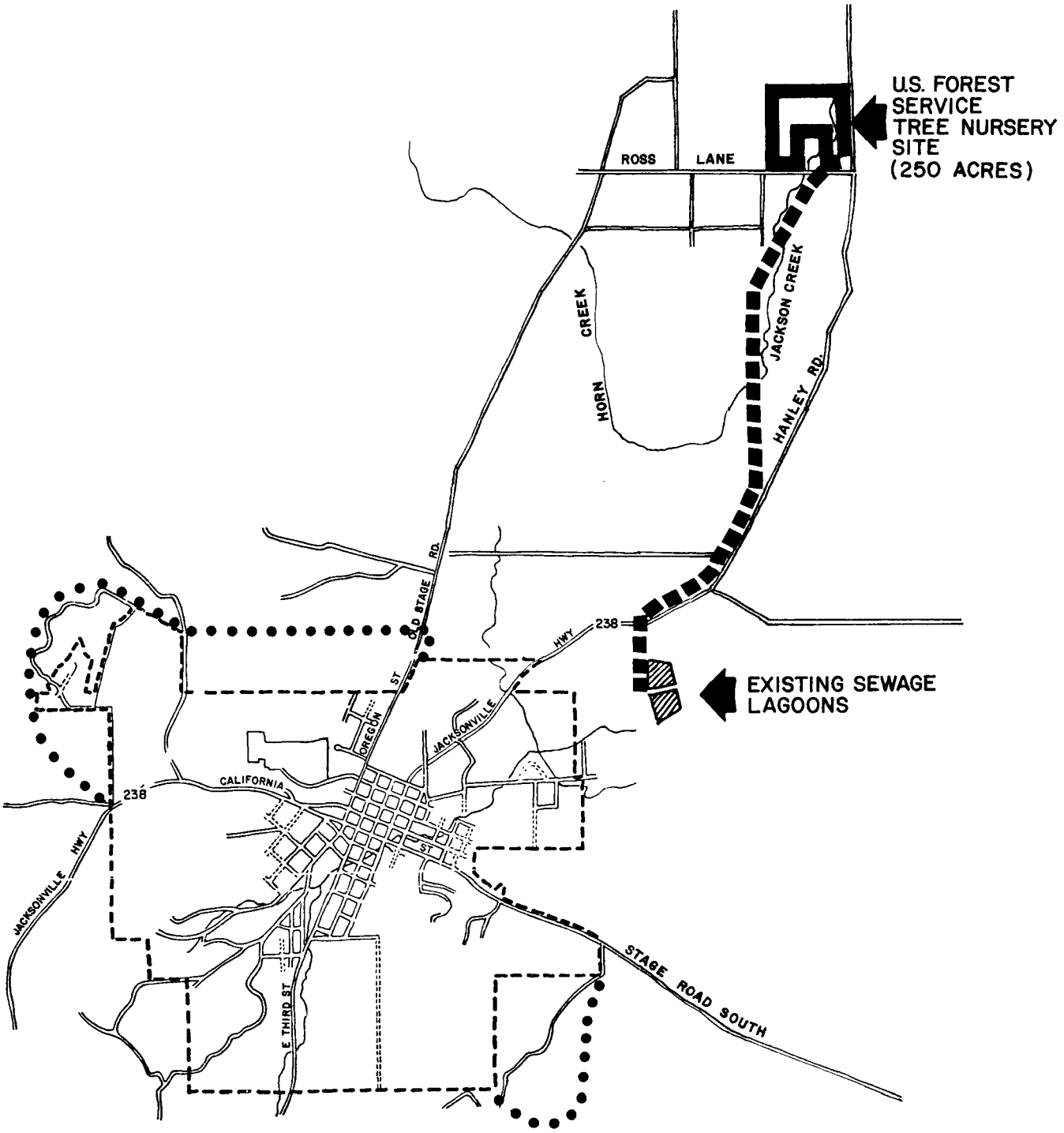


Figure 13. Alternative B (use of reclaimed wastewater by U. S. Forest Service).

Table 14

Alternative B
Activated Sludge Package Plant and
Discharge to U. S. Forest Service Tree Farm

Item	Cost, Dollars	Life, Years	Salvage Value, Dollars
Operation building, W. Lab.	15,000	25	3,000
0.425 mgd activated sludge plant	325,000	20	0
Chlorination pond, W. equip.	22,000	20	0
Expand existing lagoons for storage	54,200	50	32,500
Fence, roads, landscape	10,000	50	6,000
11,200', 12" diameter outfall	133,000	50	79,800
Total construction cost	559,200		
Salvage value at year 20			121,300
Sites and easements	31,000		31,000
Contingencies and engineering, 25 percent	139,800		
Total capital cost	730,000		
Annual operation and maintenance cost	35,400		

The capital cost of implementing Alternative C-1, assuming construction begins in 1977, is estimated to be $394,500, as shown in Table 15. The average annual operation/maintenance cost for operation of the Jacksonville sewerage collection system, the treatment facilities, and the agricultural irrigation area is $36,000; an estimated $8,500 would be returned to the city annually from harvesting of the alfalfa.

Alternative C-1a - Aerated Lagoons with Adjacent Agricultural Use (No Growth)

This alternative is essentially identical to C-1, except that the facilities would be sized to handle the existing population of Jacksonville, with very little capacity for additional growth. The facilities location will be as shown in Figure 14.

Costs of this alternative will be less than those for Alternative C-1 because of the smallness of the required treatment capacity and the fact that less land (50 acres vs. 77 acres) will be necessary for disposal.

The capital cost of implementing Alternative C-1a will be $262,000 as shown in Table 16. The average annual operation/maintenance cost will be $22,200.

Alternative C-2 - Aerated Lagoons with Spray Disposal

This alternative is identical to Alternative C-1, except for the use of the effluent. In Alternative C-2, effluent would not be utilized beneficially but would simply be disposed of on 80 acres of forest land located to the southwest of the county landfill (Figure 15).

Treatment would be in a 0.8-acre aerated lagoon and stored in the existing lagoons when spray disposal is not feasible. From the storage lagoons effluent would be pumped through an 8-inch diameter, 9,600-foot long outfall to the disposal area. Large impulse type sprinklers would be utilized in the disposal area, and provisions would be made to prevent runoff from the disposal site. The city would own and operate the disposal system in order to provide satisfactory operation.

Table 15

Alternative C-1
Aerated Lagoons with Adjacent Agricultural Use

Item	Cost, Dollars	Life, Years	Salvage Value, Dollars
Operation building, W. Lab.	15,000	25	3,000
0.425 mgd aerated lagoon system	40,800	20	0
Modify existing lagoons for storage	10,000	20	0
Chlorination equipment -			
1st 10 years	5,000	10	0
2nd 10 years	5,000	10	0
Pumping station	10,000	20	0
Fence, roads and landscaping	10,000	50	6,000
Agricultural land site preparation (includes return water system)	36,000	30	12,000
Sprinkler system	43,300	20	0
Monitoring wells	5,000	20	0
Total construction cost	180,000		
Salvage value at year 20			21,000
Sites and easements	169,400		
Contingencies and engineering, 25 percent	45,000		
Total capital cost	394,500		
Annual operation and maintenance cost	36,000		

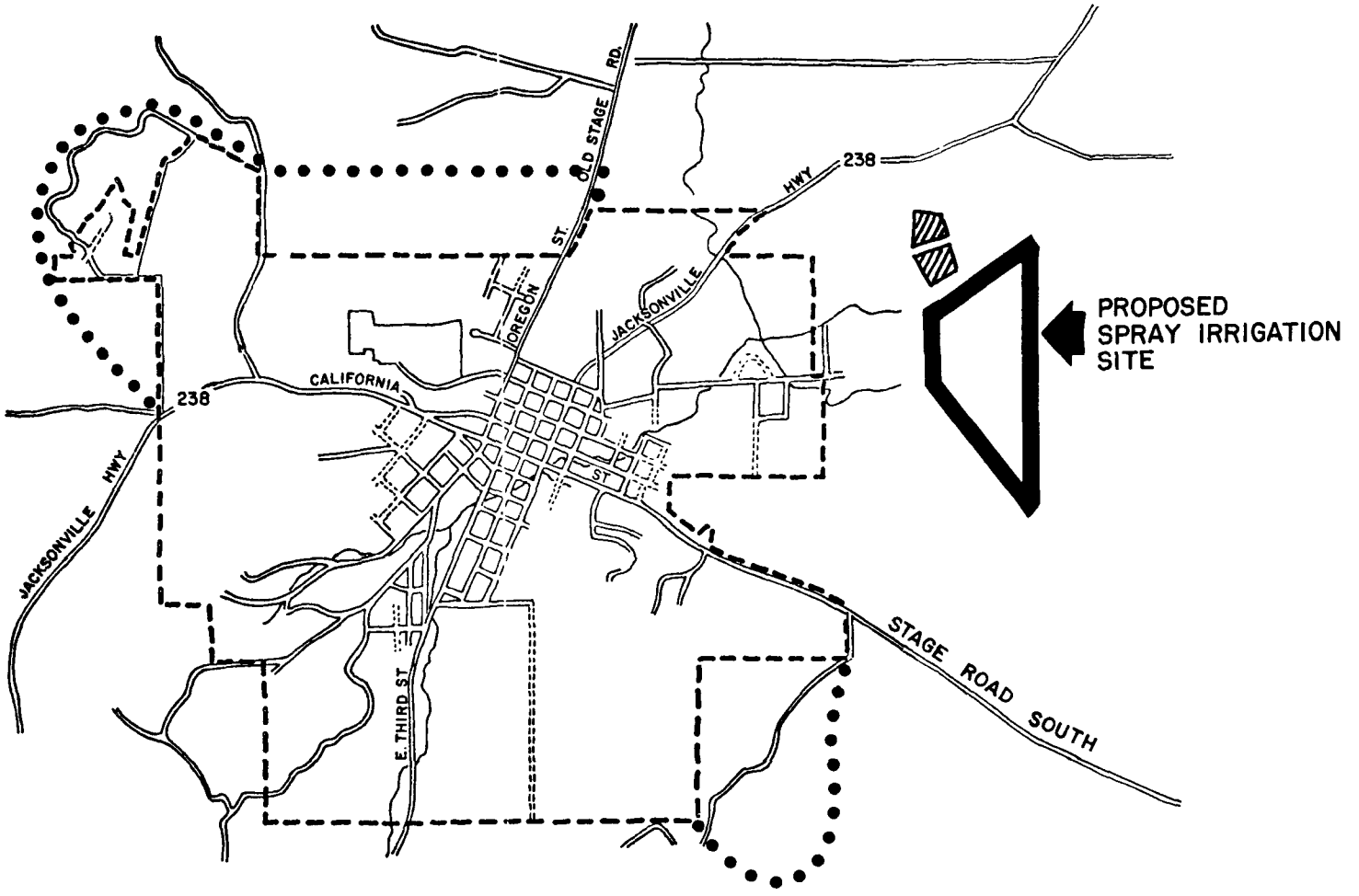


Figure 14. Alternative C-1 and C-1a (aerated lagoons with adjacent agricultural use)

Table 16

Alternative C-1a

AERATED LAGOONS WITH ADJACENT AGRICULTURAL USE -- NO GROWTH

Item	Cost Dollars	Life Years	Salvage Value After 20 Years
Operation building with lab	15,000.-	25	3,000.-
0.25 mgd aerated lagoons	30,000.-	20	0
Modify existing lagoons for storage	10,000.-	20	0
Chlorination equipment	10,000.-	10+10	0
Pumping facilities	8,000.-	20	0
Fence, roads, landscape	8,000.-	50	4,800.-
Prepare site for irrigation	20,000.-	30	6,660.-
Sprinkler system	33,000.-	20	0
Monitoring wells	3,000.-	20	0
Total construction cost	137,000.-		
Salvage value			14,460.-
Land (50 acres)	125,000.-		125,000.-
Total capital cost	262,000.-		
Annual operation and maintenance cost	22,200.-		

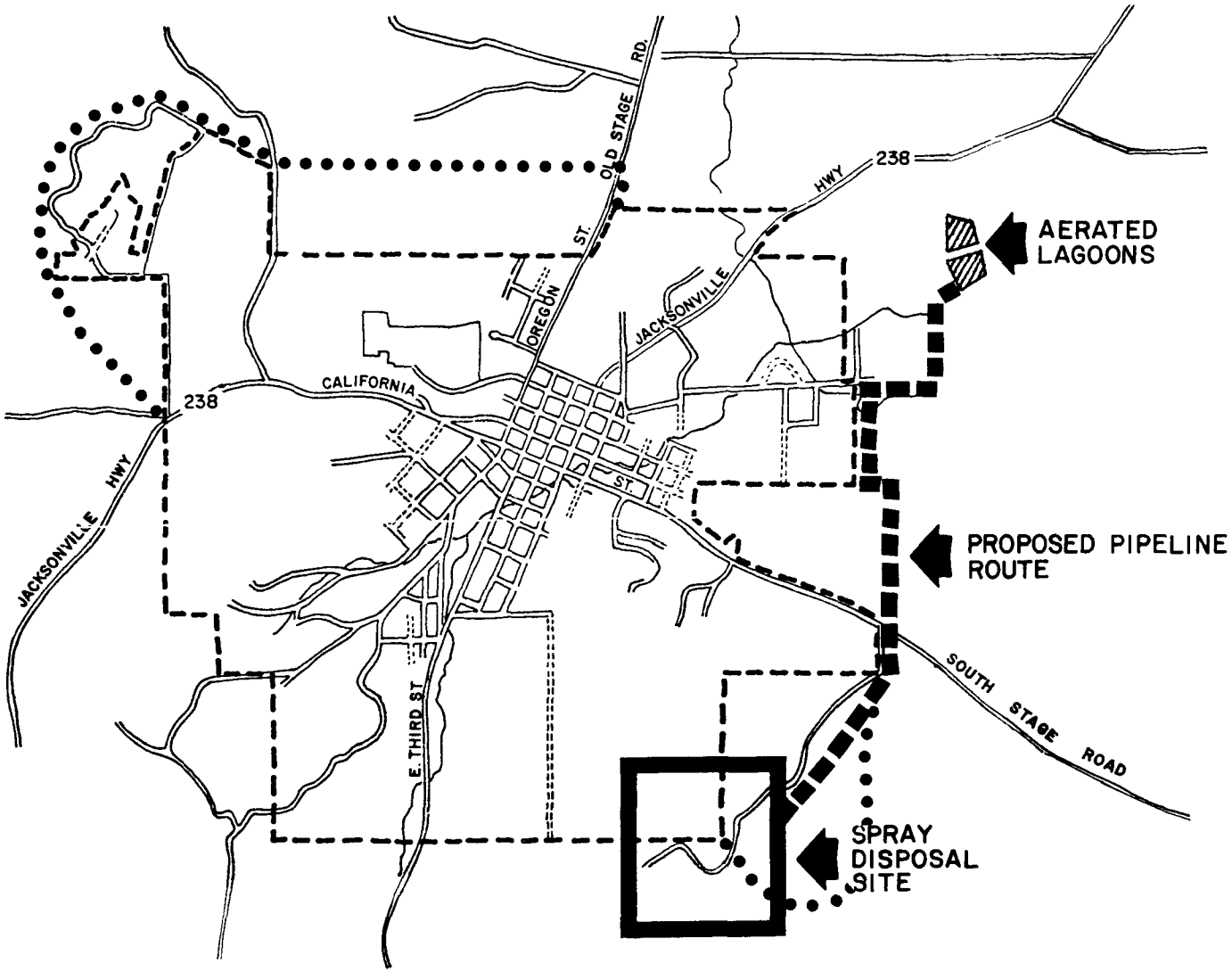


Figure 15. Alternative C-2 (aerated lagoons with spray disposal).

The capital cost of constructing the entire system in 1977 is estimated to be $317,500 as shown in Table 17. Average annual cost to operate the treatment and disposal system as well as the city's sewerage collection system would be $46,500.

Alternative D - No Action Alternative

In this alternative no action would be taken to solve existing treatment and disposal problems. No facilities would be constructed and discharge to Daisy Creek would continue. Probable consequences of this alternative would be violation of effluent quality stipulation in the city's NPDES permit, and the initiation of enforcement proceedings by EPA and/or the State of Oregon. In all probability this would mean that punitive actions could be taken by the various state or federal agencies, coupled with a prospect that Jacksonville might lose any federal aid funds which might now be available. Odor problems at the treatment facility would continue and perhaps worsen. The present ban on new connections would in all likelihood remain in effect.

Cost Comparison and Summary

Two methods can be utilized to compare the overall costs of the proposed alternatives:

1. Total equivalent annual cost to construct and operate over 20 years.

2. Local equivalent annual cost to construct and operate over 20 years.

Equivalent annual cost represents the summation of annual operation/maintenance costs and the annual principal and interest payments to retire the construction bonds. In the case of item 1 above, this number is somewhat misleading because it treats the 75 percent capital cost funded by the federal grant as though interest must be paid to retire a bond. Thus, the second method is perhaps the more realistic method from which to evaluate projects, and certainly gives a truer picture of actual local costs. A comparison of both total and local equivalent annual cost is presented in Table 18. As can be seen, Alternative C-1 is the least expensive monetarily, regardless of the method of comparison utilized. Appendix C presents a more detailed comparison of these costs.

Table 17

Alternative C-2
Aerated Lagoons with Spray Disposal

Item	Cost, Dollars	Life, Years	Salvage Value, Dollars
Operation building, W. Lab.	15,000	25	3,000
0.425 mgd aerated lagoon	40,800	20	0
Modify existing lagoons for storage	10,000	20	0
Chlorination equipment	5,000	10	0
	5,000	10	0
Pumping station and controls	15,000	20	0
Fence, roads and landscape	10,000	50	6,000
Outfall to disposal area, 9,600' of 8" pipe	81,600	50	49,000
Disposal site preparation	31,000	20	0
Sprinkler system	41,000	20	0
Total construction cost	254,000		
Salvage value at year 20			58,000
Sites and easements	40,000		40,000
Engineering and contingencies, 25 percent	63,400		
Total capital cost	317,500		
Annual operation and maintenance cost	46,500		

Table 18

20-YEAR COMPARISON OF TOTAL AND LOCAL COSTS

Alternative	Average Annual Equivalent Cost	
	Total Cost Basis, $/Year	Total Cost Basis, $/Year*
A-1	131,600	83,000
A-2	128,700	80,100
B	97,600	49,400
C-1	58,200	32,100
C-1a	37,200	20,000
C-2	72,700	51,700

* Local cost is the equivalent annual cost of capital facilities after subtracting federal grant, plus the annual operation/maintenance costs.

IV. ANALYSIS OF THE ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

Introduction

Central to the evaluation of the proposed viable alternatives are the various environmental impacts that result. In this chapter, both beneficial and adverse impacts are identified. Primary attention is given to those factors most evidently affected by the proposed actions.

The Environmental Protection Agency guidelines for the preparation of environmental impact statements [40 CFS, Part 6, 6.304(c)] require that primary and secondary environmental impacts, of short- and long-term duration, be evaluated. This EIS identifies the short-term, long-term direct and long-term secondary impacts related to all project alternatives.

> "Primary impacts are those that can be attributed directly to the proposed action.... If the action involves construction of a facility, such as a sewage treatment works..., the primary impacts of the action would include the environmental impacts related to construction and operation of the facility and land use changes at the facility site.
>
> "Secondary impacts are indirect or induced changes. If the action involves construction of a facility, the secondary impacts would include the environmental impacts related to:
>
> i) Induced changes in the pattern of land use, population density and related effects on air and water quality or other natural resources.
>
> ii) Increased growth at a faster rate than planned for or above the total level planned by the existing community." (Federal Register, Vol. 40, No. 72, part III)

Impacts Common to All Alternatives

Many of the impacts of the wastewater treatment and disposal project occur regardless of choice of any particular alternative plan. These common impacts come about as the result of general construction and development activities and operation of the system.

Short-Term Impacts

Short-term impacts are, as the name implies, a short and definite period of impact, usually from the start of construction until completion of the project. Such impacts can usually be effectively mitigated. Common short-term impacts and mitigation measures are presented in Table 19.

Long-Term Direct Impacts

Long-term direct impacts result from the construction, location and/or operation of the facilities and generally remain in force for the life of the project or longer. The time span may be from 20 to more than 50 years. These impacts tend to be on or near a facilities site or pipeline route or in the area of wastewater disposal. Some impacts are generally common to all alternatives in that the magnitude of variation in degree of impact among alternatives is small. These impacts do not greatly influence the selection of a recommended plan from among the alternatives even though the impact may be significantly adverse.

For ease of understanding, the following long-term impacts have been divided according to major areas of concern -- physical and biological resources, social features and financial considerations.

Physical and Biological Resources

The following list indicates those physical and biological resource impacts to be discussed in the subsequent text.

- Water resources - quality and quantity
- Geologic and flood hazards
- Soils
- Air quality
- Vegetation and terrestrial wildlife
- Aesthetics
- Archeological
- Energy

Table 19

SHORT-TERM IMPACTS
JACKSONVILLE SEWAGE TREATMENT ALTERNATIVES

The direct short-term impacts of this project are related to construction activities. These impacts are relatively minor in effect and magnitude and in most cases the adverse impact can be effectively mitigated. The impacts considered, their mitigation and our judgment of the relative level of effect are given in the following matrix.

Short-Term Impacts	Alternatives A-1	A-2	B	C-1	C-1a	C-2	D	Recommended Mitigation Measures
Temporary loss of vegetation	-	-	+	-	-	-	0	o Replant after construction or allow for natural regrowth of shrubs and trees. o Vegetation adjacent to pipelines should be flagged or fenced to keep vegetative destruction to a minimum.
Disruption of wildlife	-	-	+	0	0	+	0	o Vegetation stripping for the pipelines should occur during the late summer or fall months when nesting birds are not present.
Construction-related traffic	+	+	+	+	-	+	0	o Construction should occur, if possible, during the fall periods when traffic volume is lower.
Utility service disruption	-	-	-	-	-	-	0	o Advance notice of anticipated utility disruption should be given. o If a lengthy period of disruption is necessary, utility bypasses should be provided.
Disruption of through and local traffic	+	+	-	-	-	-	0	o Barricades and flagmen should be posted as necessary to guide traffic through construction zones, residents in area should be notified as to location, nature and duration of construction.
Dust	-	-	-	-	-	-	0	o Keep soil wetted down in construction area.
Increased potential soil erosion	-	-	-	-	-	+	0	o If possible, construction should be done during the drier months of the year. o After construction, exposed soil areas should be reseeded using grasses native to the area.
Employment	B	B	B	B	B	B	0	o None necessary.
Economic activity	B	B	B	B	B	B	0	o None necessary.
Safety hazard	+	+	+	-	-	+	0	o All open trenches should be covered or fenced at the end of each work day. o All construction equipment should be secured against unauthorized use.

LEGEND:

- \- Minor adverse impact
- \+ Moderate adverse impact
- B Beneficial impact
- 0 No change from present

Short-Term Impacts	Alternatives A-1	A-2	B	C-1	C-1a	C-2	D	Recommended Mitigation Measures
Aerial pollutants	-	-	-	-	-	-	0	o All vehicles and equipment should be fitted with appropriate pollution control devices that are properly maintained.
Visual impact of construction equipment and construction site	+	+	+	-	-	-	0	o Equipment should be stored in a designated area. All litter should be picked up. o Fence or otherwise screen construction maintenance area.
Spoil disposal	-	-	-	-	-	-	0	o Disposal of spoil material from the pipeline should be coordinated with other ongoing projects needing fill material.
Stockpiling and storage of spoil	-	-	-	-	-	-	0	o All spoil material not needed for backfilling should be removed from the pipeline route or spread over the surface and seeded.
Increased noise	+	+	+	-	-	+	0	o All equipment should have mufflers, properly installed and maintained. o Construction activities should be limited to daylight hours.
Water quality (streams)	0	0	+	-	-	-	0	o Construction activities in streamways should be limited to low flow periods. o Care should be taken not to discharge petroleum or other pollutants into stream.
Temporary blockage of streamways, increased turbidity and disturbance of fish life.	0	0	+	-	-	-	0	o Construction should occur during low flow periods (late summer) and when anadromous fish populations would be least affected.

Water Resources - Quality and Quantity.

o *The construction of a waste disposal system will improve the quality of water in area streams.*

Under present conditions, wastewater from the Jacksonville sewage lagoons discharges into Daisy Creek and thence into Jackson Creek. During the summer months the wastewater and agricultural return flows comprise virtually the entire source of water in Daisy Creek. Under such conditions, the quality of water in the creek does not meet DEQ standards during summer flows. Suspended solids and BOD are often above acceptable standards (DEQ evaluation of permit compliance, 1975).

The construction and operation of any of the alternative treatment and disposal options will eliminate wastewater flow to Daisy Creek. Such action is expected to result in compliance with DEQ water quality requirements.

Improvement in Daisy Creek water quality represents a benefit to downstream users by improving water quality.

The no action alternative will result in continued violation of DEQ water quality requirements and adversely impact the beneficial uses of the stream.

o *The construction and operation of a wastewater disposal system will reduce flows in Daisy Creek.*

During 1975, wastewater flows to Daisy Creek from the sewage ponds varied between 114,000 to 295,000 gallons per day and for the 12-month period averaged 174,000 gallons per day. During the dry summer months this wastewater discharge represents nearly the entire flow in Daisy Creek.

Construction and operation of any of the alternatives will result in a reduction of flow in Daisy Creek. The effects of such a flow reduction are expected to be minor. Under natural conditions, Daisy Creek was ephemeral -- maintaining a flow only during the winter months.

Alternative D, No Action, would result in the continuation of discharges to Daisy Creek and additional flows in future years. The no action alternative would be in violation of the NPDES permit issued by DEQ.

o *Impact on groundwater from land disposal of wastewater.*

Four of the alternatives, B (U. S. Forest Service land), C-1, C-1a (sites near existing sewage lagoons) and C-2 (site at county landfill), represent disposal options utilizing spray irrigation.

Under existing conditions, many portions of the Bear Creek Valley have experienced rising groundwater levels because of increased irrigation of crops. This is perched groundwater which lies atop clay layers in many areas. In areas around Jacksonville the median depth to groundwater is 10 to 14 feet and usually higher during the rainy months.

The quantity of wastewater for Alternatives B, C-1 and C-2 is projected to average 160,000 gallons per day in 1976, 318,000 per day in 1987 and 424,000 in 1997. Alternative C-1a (no growth) will likely average between 160,000 gallons and 212,000 gallons (1976 population x 100 gallons per capita per day).

The impacts on groundwater at the various alternative sites will be as follows:

- Alternative B (U. S. Forest Service land) -- The sewage effluent from the activated sludge plant will be blended with irrigation water in a 1:5 ratio during the summer months and a 1:21 ratio for fall and spring application and sprayed on 240 acres of land. Irrigation needs will amount to 780,000 gallons per day (gpd) from June through September and 3.4 million gallons per day (mgd) during the fall and spring. No water will be utilized during the winter months. The ratio of wastewater to irrigation water will change as wastewater quantities increase. The 1997 ratios of wastewater to irrigation water are projected to be 1:1.8 in the summer and 1:8 in the winter.

  The application of water on the 250 acres will not affect groundwater on the site because the Forest Service is planning to install a subsurface drainage, runoff collection system and sump, thus drainage would be recycled.

- Alternative C-1 (site near sewage lagoons) -- Much of the 77-acre site is underlain by Medford soils; however, several veins of restrictive Cove soils crisscross the site. The Cove soils are characterized by a perched water table, which often surfaces during the wet winter months. These soils also form "dikes" to lateral water movement, causing high water table conditions even in adjacent Medford soils.

The application of wastewater at this site may create a high water table during the winter months, although during early years of operation this will likely be of little impact due to the small quantity of water applied. The application water quantities projected for 1987 and 1997 could cause a more substantial rise in the perched groundwater.

- Alternative C-1a (site near sewage lagoons) -- The soils site description as presented above for Alternative C-1 also applies to C-1a. The major differences in impact will be that only 50 acres of land will be necessary for Alternative C-1a, and the quantity of wastewater applied over the 20-year life of the project will not increase substantially. The impacts on the water table during the later years of operation will not be as great as would occur under Alternative C-1.

- Alternative C-2 (county landfill) -- This alternative site has a slope ranging from 7 to 35 percent and has a combination of Brader loam and Vannon silt loam. Depth to groundwater is greater than 6 feet; however, upon hitting the clay subsoil water tends to move laterally downslope. If the combination of precipitation and spray disposal was excessive, water could outcrop downhill from the disposal site or cause a rising water table.

  This could cause problems wherever physical structures such as roads and buildings would be involved.

  Complete soil surveys would be necessary at the disposal site to determine groundwater movement. Problems of overloading the holding capacity of soils during the wet winter months could be alleviated by storing wastewater in holding ponds.

Flood and Geologic Hazards.

o *Damage to treatment facilities due to flood or geologic hazards.*

The potential for damage to treatment facilities as a result of physical damage from earthquakes or subsurface flooding is slight.

There are no known active or concealed earthquake faults in the vicinity of Jacksonville.

Potential flood hazards exist at all streams within the study area. Unusually high stream discharge could cause damage to sewage lines crossing Daisy Creek (Alternatives C-1, C-1a and C-2) and Jackson Creek (Alternative B).

In order to reduce the potential for such damage, the facilities should be designed to avoid physical damage, i.e. they should be designed to withstand the consequences of 100-year storm flooding. In all alternatives the disposal pipelines should meet strong leakage requirements following construction to help ensure against groundwater infiltration.

Soils.

o *Impact on soils from the application of wastewater.*

Soils will be impacted from application of wastewater in three of the alternatives.

- Alternative B -- The U. S. Forest Service land is underlain by Central Point and Kubli soils. At the present time, the U. S. Forest Service is preparing a detailed soils grid of the site to determine areas of restriction or limitation for growing nursery stock or draining irrigation water.

- Alternatives C-1 and C-1a -- The C-1 site is 77 acres of flat land south of the sewage lagoons. The site for Alternative C-1a is essentially the same except that only 50 acres of land are necessary. Soils include Medford, Manzanita, Ruch and Cove series. The Cove series occurs as veins throughout portions of the site. This soils series is restrictive in terms of irrigation potential. These areas of Cove soil will represent a potential problem for irrigation.

  The remaining soils have good permeability and suitability for irrigation.

  Before this site can be utilized for wastewater disposal, a complete survey of soils, drainage patterns, etc. must be accomplished. The results of the survey would determine whether a subsurface drainage system was necessary, with a collection and redistribution system, as well as what type of application method should be utilized. Generally speaking, small acreage areas (less than 200 acres) are served best by spray irrigation rather than by ridge-and-furrow distribution (flood irrigating) (EPA, 1973).

In all likelihood storage ponds will be needed to hold wastewater for some time during the winter months. Even during other times of the year there may be a gap between the rate and continuity of wastewater production and the ability of the land to accept the application of effluents.

Under both alternatives the wastewater is projected to be applied over 50-acre areas at the rate of 1 inch per week loading. With such a low application rate there are not likely to be any problems with soil clogging due to sodium buildup or biological slimes. As wastewater flows increase, as the population of Jacksonville increases, the rate and area of application will need to be changed to reflect the quantity changes.

- Alternative C-2 -- The soils on the C-2 alternative site above the landfill consist of Manzanita, Brader loam and Vannon silt loam. All soils have good permeability with a slope varying from 7 to 35 percent. There are no known areas of restrictive soils; however, a complete survey should be conducted to establish locations of any such soils and to determine the exact location for spray disposal. With the projected low application rate of wastewater, soil erosion or slumping problems are not expected to occur.

Air Quality.

o *Odor.*

Under normal working conditions, none of the alternatives is expected to create major odor problems. The proper engineering design, combined with the proper operation of wastewater treatment facilities, would control the production and release of odors to concentration levels not detectable beyond the treatment facility boundary.

Alternatives A-1 and A-2 will not produce odors in the Jacksonville area since no new treatment facilities will be located there. In a proportional sense the odor is transferred to the BCVSA plant.

In Alternative B, secondary-treated wastewater will be stored in holding ponds for a short time. To eliminate the chance of odor production, partial disinfection and pond aeration should be provided after secondary treatment. The activated sludge plant associated with this alternative should be located a sufficient distance from residential areas to avoid odor complaints. There should be no detectable odor associated with spray irrigation of the blended, secondary-treated wastewater.

Alternatives C-1, C-1a and C-2 will consist of land disposal of secondary-treated wastewater from aerated lagoons. In a properly operating aerated lagoon system, odors should be negligible. Spray disposal with wastewater which has been secondarily treated and chlorinated will have little odor impact. In the event of a malfunction of treatment processes, Alternative C-2 will have less of an odor impact on residential areas than will C-1 and C-1a.

Alternative D (no action) will result in a continuation of periodic odor problems associated with the present lagoon treatment system. While there are no sensitive stationary receptors in the immediate area surrounding the lagoons, odors are often evident from the Jacksonville Highway.

o *Regional air quality.*

None of the alternative wastewater facilities will create direct adverse effects on the regional air quality. Instead, the major impacts on air quality will result from increased socio-economic development in Jacksonville. Added population growth, as well as increased tourist traffic, will result in increased highway vehicular emissions from off-highway sources (utility engine and construction equipment emissions) and open burning of trash such as wood and landscape refuse.

Because Jacksonville (and the entire Medford area) lies within an air quality maintenance area (with regard to particulates and oxidants) future population growth will have a significant impact on air quality relative to vehicular emissions (Table 20). The projected air emissions from mobile sources as shown in Table 20 are based on a 7 percent population growth (5,745 by the year 2000) for Jacksonville, a 5 percent growth for the rural area, a combination of the two, and a population assuming the capacity of the interceptor system (see population projections in Appendix H).

If the population of Jacksonville were to follow a no growth pattern (Alternative C-1a), pollutant emissions from vehicular sources in Jacksonville would decrease greatly. The total effect on the regional air resources of no population growth in Jacksonville, however, would be difficult to assess. Because air resources are a regional consideration, there will be other factors involved in determining the ultimate air quality of the basin, one of the most significant being population growth in the areas surrounding Jacksonville and Medford.

Table 20

INDEX OF MOTOR VEHICLE AIR POLLUTANT EMISSIONS

Year	Area and Population Basis	Vehicle Miles of Travel[1]	Vehicle Emissions[2] (Pounds Per Day) Carbon Monoxide	Total Hydrocarbons	Nitrogen Oxides	Sulfur Oxides	Particulates
1975	City Mid-Range	30,000	4,041	582	317	15.2	39.0
	Study Area - Low	37,248	5,017	723	394	18.9	48.4
	Study Area - High	37,248	5,017	723	394	18.9	48.4
1980	City Mid-Range	40,686	2,781	484	323	17.9	42.2
	Study Area - Low	49,740	3,399	592	395	21.9	51.5
	Study Area - High	87,114	5,954	1,037	691	38.4	90.3
1985	City Mid-Range	51,318	1,776	305	272	21.5	46.4
	Study Area - Low	62,190	2,153	370	329	26.1	56.2
	Study Area - High	136,986	4,741	815	725	57.4	124
1990	City Mid-Range	61,968	1,544	260	273	26.0	54.6
	Study Area - Low	74,652	1,860	313	329	31.3	65.8
	Study Area - High	186,870	4,655	783	824	78.3	165
1995	City Mid-Range	72,606	1,809	304	320	30.4	64.0
	Study Area - Low	87,102	2,170	365	384	36.5	76.8
	Study Area - High	236,742	5,898	992	1,044	99.2	209
1997	City Mid Range	76,866	1,915	322	339	32.2	67.8
	Study Area - Low	92,088	2,294	386	406	38.6	81.2
	Study Area - High	256,686	6,395	1,075	1,132	108	226
2000	City Mid-Range	83,262	2,074	349	367	34.9	73.4
	Study Area - Low	99,564	2,408	417	439	41.7	87.8
	Study Area - High	286,608	7,140	1,201	1,264	120	253

NOTES: Based on population projections and per capita travel index from Appendix H.

[1] Assuming an average one-way trip length of 6 miles.

[2] Using projected national average vehicle emission factors from U. S. Environmental Protection Agency, 1976, Table D.7-1. 1990 emission factors used for 1995-2000 period.

Table 20 shows the impact on air quality if the population of the surrounding rural area were 1,050 people (1997 projected population) or 12,410 people (population based on interceptor size). The ultimate population will be dependent on a number of factors, among them allowable zoning, economic conditions, desirability of the area, etc.

Vegetation and Terrestrial Wildlife.

o *The construction of sewage facilities will impact vegetation and attendant wildlife.*

Sewage facilities require land and the removal of some native vegetation. This removal of habitat will affect wildlife both directly and indirectly. Subsurface dwelling and sedentary mammals, amphibians and reptiles at facilities locations will be destroyed during construction. Some birds, mammals and reptiles that periodically use facilities sites might be excluded from this use.

- Alternative A-1 and A-2 -- The proposed interceptor connecting the Jacksonville sewerage system to the existing West Medford Trunk line will, for a portion of its length, parallel existing roadway (Jacksonville Highway). Impacts on vegetation and wildlife along this length of sewer line will be minor. For the remainder of its length, the interceptor will parallel Daisy Creek and a fallow field.

- Alternative B -- Portions of the pipeline from the sewage lagoons to the U. S. Forest Service land, will parallel Hanley Road before following fencelines and crossing cultivated fields and Jackson Creek. Impact on vegetation and wildlife along Hanley Road will be negligible; however, portions of the route through and adjacent to cultivated fields and riparian vegetation will have more significant impact. Riparian habitat is among the most valuable to wildlife. The impacts of this pipeline route could be reduced by rerouting to parallel existing roadways or to previously disturbed areas. Paralleling Hanley Road for the entire distance would require use of a pumpstation.

- Alternative C-1 and C-1a -- A wastewater distribution system for irrigation of agricultural land at Site C-1 and C-1a would have an insignificant impact on vegetation and wildlife.

- Alternative C-2 -- The pipeline to disposal Site C-2 will border fencelines, cross existing cultivated fields and grazing lands and foothill areas of oak/fir/pine mixed woodland. Following pipeline construction, much of the vegetation is expected to regrow; however, a somewhat open right-of-way will be maintained for maintenance.

- Alternative D -- Under the no action alternative there will be no additional impact on terrestrial vegetation and wildlife resources.

The most significant impacts on vegetation and wildlife will result from subsequent population growth in Jacksonville and the surrounding service area. While the land to the north and west of Jacksonville is considered poor agricultural land, it is valuable to game and nongame wildlife. Because the majority of future development will likely be away from good class agricultural land, the upland areas will probably be used more and more for residential development. This residential growth will cause a reduction in deer winter range and habitat for other upland game and nongame species.

The degree of impact on this wildlife habitat will depend on the ultimate population, direction of population growth, and state and county policy decisions regarding resource management.

The maintenance of present zoning (one dwelling per 5 acres) in the area surrounding Jacksonville will do a great deal to ensure the maintenance of upland habitat.

Alternative C-1a (no growth) would cause little or no secondary impact on vegetation and wildlife within the City limits of Jacksonville. Much of the land now supporting wildlife is likely to continue that function.

o *Rare, endangered and threatened species.*

The three species deemed rare, endangered or possibly threatened are either seasonal visitors to the study area or occur primarily in habitats outside of the facilities area.

o *Impacts on natural vegetation resulting from application of wastewater.*

Four of the alternatives (B, C-1, C-1a and C-2) would result in the application of wastewater onto vegetated areas.

- Alternative B -- This site is presently fallow in some portions and used for cut and baled hay on others. The U. S. Forest Service will be planting coniferous seedlings and spray irrigating with a blend of irrigation and wastewater. Because this site is presently disturbed and will be disturbed in the future and does not support native vegetation, the impacts of wastewater will be insignificant.

- Alternatives C-1 and C-1a -- The site for these alternatives is also cultivated (alfalfa hay) and when irrigated will also be used to grow alfalfa. The impact of wastewater application on natural vegetation will also be considered insignificant.

- Alternative C-2 -- This alternative site is presented vegetated with a mix of oak, pine and fir. Previous studies on the effects of applying wastewater to woodlands have shown a favorable response of vegetation to irrigation up to about 1 inch per week (Metcalf & Eddy, 1976). Vegetation receiving 2 inches of wastewater per week showed reduced growth due to excessive soil moisture. In some areas of the United States, minerals such as boron and constituents such as total dissolved solids, chlorides, sodium and heavy metals can affect crops or irrigated vegetation. The quality of effluent water from Jacksonville is expected to be satisfactory for land disposal and to be low in boron (a major influencing factor on vegetation), sodium, chlorides and heavy metals.

  The application of wastewater will likely result in some vegetative changes, with those species requiring moist environments being favored and eventually dominating some of the more xeric species.

Aesthetics.

o *Aesthetics impact.*

The impact on aesthetics for all alternatives will be minor.

The activated sludge plant for Alternative B would be located in the vicinity of the existing sewage lagoons off of the Jacksonville Highway. The plant would be set back enough from the roadway to reduce visual impact. The planting of trees and scrubs around the facility would eventually screen the plant from view.

Holding ponds for Alternative B and aerated lagoons for Alternatives C-1, C-1a and C-2 would be raised by a dike system slightly above the natural land contour. The facilities should not be visible from the road. The addition of landscaping with vegetation native to the area would provide a screening of dike areas and other low structures.

The spray irrigators for Alternatives B, C-1, C-1a and C-2 will look much like those presently used for agricultural use.

The major impact on aesthetics will result from the secondary influences of population growth. The open agricultural lands to the east and the wooded hillsides to the west and north represent the focal points of the Jacksonville setting. The future trend of residential development will probably be toward the surrounding hills and away from the more valuable agricultural lands.

Alternatives A-1, A-2, B, C-1 and C-2 will all have an effect on aesthetic values of Jacksonville, with A-1 and A-2 exerting a greater impact on the lands surrounding the city.

The likelihood of major impacts on aesthetic quality are greatly diminished with Alternatives C-1a and D because of the growth-limiting features of each.

Archeological.

o *Impact of the various alternatives on archeological resources.*

- Alternative A - No apparent impact on cultural resources.

- Alternative B - Alternative B would require the construction of 11,200' of pipeline between existing sewage lagoons and U. S. Forest Service property north of Ross Lane. Approximately 80 percent of the proposed line was traversed by the archeologist. No cultural resources were encountered between the sewage lagoons and the line paralleling Hanley Road. The line leaves the road along the eastern boundary of section 41 and heads north, proceeding to Horn Creek. The line then parallels Horn Creek between the boundary of section 41 and Ross Lane.

A major archeological site (site designation pending) was discovered beginning at the intersection of section 41 (east boundary) and Horn Creek. The site parallels both sides of the stream channel on the property of the Oregon State University Experimental Agricultural Station and continues in a northeasterly direction into the adjoining Heffernan property.

Heavy crop cover on the Heffernan property paralleling Horn Creek did not allow direct surface observations. Discussions with the Heffernans and people at the experiment station about cultural resources along Horn Creek suggested either the presence of numerous small sites or a single large site paralleling the old channel.

The impact of the proposed pipeline on these archeological resources can be mitigated by: 1) Continuing the pipeline down the section 41 boundary following Redwood Drive, then down Ross Lane to the spray application site. By relocating the line away from an old stream channel, the likelihood of encountering cultural resources lessens. Such a relocated route would need to be surveyed for cultural resources. 2) Mitigate impact on archeological sites through excavation by professional archeologists. If the route along Horn Creek is selected for construction with no route change, excavation of several archeological sites may be mandatory. The cost of these excavations could exceed $80,000.00 plus a significant delay in construction of the sewage line. 3) Relocating the pipeline route along Hanley Road for its entire length.

The 250-acre tree nursery (spray irrigation site) was not surveyed for archeological resources; however, it is understood that the U. S. Forest Service is in the process of conducting a field reconnaissance.

- Alternatives C-1 and C-1a - A complete archeological survey of this spray irrigation site south of the sewage lagoons was not conducted and informants did not know of any archeological materials having ever been recovered from this area. The likelihood of encountering archeological sites on this area is low, but a systematic archeological survey would be required should this option be selected.

- Alternative C-2 - Alternative C-2 entails the construction of a 9600' pipeline from existing sewage lagoons to a land application site near the present Jacksonville land fill site. The proposed pipeline route was walked by the archeologist with negative results. However, dense grass cover along 50 percent of the route limited surface observations. As with Alternative C-1, informants knew of no archeological sites along this pipeline. The land application site was not surveyed.

Based on limited surface reconnaissance and informant testimony, no cultural resources will be impacted by this pipeline. The land application site would be surveyed if this alternative is selected.

A grant condition of the project chosen would be to minimize the impact on archeological resources.

No surface reconnaissance is absolute. The likelihood that several archeological sites lie buried within alluvial deposits is high. During construction, should any archeological materials be encountered, archeologists from Oregon State University or the State Historic Preservation Office in Salem should be notified and construction halted on that section of line immediately. Prompt action will be taken by the archeologists to minimize construction delays.

Energy.

o *Impact of consumptive use of energy*

All alternatives, except the no action alternative, will have an impact upon energy consumption. Alternative C-2 will require the greatest amount of energy because of the requirement for pumping large amounts of effluent to the hillside disposal area (Table 21).

Energy requirements for Alternatives C-1 and C-1a are identical, while Alternative B represents the least requirement of energy consumption for the alternatives because no pumping will be required.

Social Features

The following list indicates those social impacts discussed in the subsequent text:

- Population growth
- Land use
- Land use planning
- Traffic
- Water supply
- Quality of life and social well being
- Historical value and integrity
- Historic landmark
- Cumulative effects

Table 21

ENERGY REQUIREMENTS
KILOWATT-HOURS/20 YEARS

Alternative	Treatment	Pumping	Total
A-1	UK*	UK	UK
A-2	UK	UK	UK
B	3,226,600	0	3,226,600
C-1	4,204,800	876,000	5,080,800
C-1a	4,204,800	876,000	5,080,800
C-2	4,204,800	4,380,000	8,584,800
D	--	--	--

* UK = Unknown.

Population Growth.

o *Impact on population.*

For purposes of this discussion, population growth and future land use will be considered within the same topic category since they tend to overlap and are similar in scope.

Alternatives A-1 (annexation with BCVSA) and A-2 (lease with BCVSA) provide sewage services to a much larger geographic area than Jacksonville. Sewering of lands outside Jacksonville would be expected to result in a greater density of habitation and thus stimulate growth in this locality.

The selection of Alternatives A-1 and A-2 would result in the construction of a pipeline (sized at 15, 18 and 24 inches in diameter) from the existing 15-inch Jacksonville line to the terminus of the 30-inch West Medford Trunk at Pioneer Avenue. The 24-inch pipeline could service an ultimate population equivalent to 20,943 people, based on peak wastewater flow of 250 gpcd. While Jacksonville will be responsible for a pro rata share of interceptor use, the remaining capacity of the pipelines will be designed to support portions of the West Medford Trunk District of BCVSA surrounding Jacksonville on the north, south and west (see Figure 9).

The flow and equivalent population capacities of pipeline segments are as follows:

	Flow Capacity	Potential Population Pipeline Can Serve
24-inch pipeline; Pioneer Avenue to Hanley Road intersection	5.24 mgd	20,943
15-inch pipeline; existing Jacksonville interceptor, Jacksonville to sewage lagoons plus new section to Highway 238	2.13 mgd	8,533

The interceptor pipeline from Jacksonville as now sized at 15 inches could serve a population of 8,533 people, about 3,200 more than projected under 0.7 percent growth.

Jacksonville encompasses 1,274 acres and has a population of 2,070 or 1.6 persons per acre. Population projections of 5,300 for 1997 on 1,602 acres (present Jacksonville limits plus the urban growth boundary area) would increase the density to 3.3 persons per acre

According to the existing zoning classification (one dwelling per 5 acres), a maximum of 4,323 people could inhabit the service area surrounding Jacksonville. Based on the projected size of the interceptor from Pioneer Avenue to Hanley Road, the A-1, A-2 service area capacity (total capacity minus Jacksonville capacity) will be capable of handling a population of 12,410 people, or approximately 8,087 more than the projected zoning capacity. In order to achieve such a population in the service area, a zoning classification change will be necessary.

Alternatives B, C-1 and C-2 are proposed to support only population growth in the Jacksonville urban growth boundary. By the design of the facility capacity, the growth of the population is expected to be more confined (to that area within the City of Jacksonville and urban growth area) but not necessarily at a slower rate than that of Alternative A-1 or A-2.

Alternative C-1a (no growth) represents an alternative which will allow support of only the existing population of Jacksonville. The 1975 population was estimated to be 2,070* and the plant design of 0.25 mgd of wastewater will support a population of not more than 2,500 people (based on 100 gallons of wastewater per capita per day). The population to be supported under Alternative C-1a is expected to be confined to existing City of Jacksonville boundaries and it will not be necessary to incorporate the urban growth boundary.

Alternative D (no action) is presently and would continue to be restrictive for population growth. Residential and commercial establishments are now denied permits for sewerage hookup because of the inability of the present disposal system to properly treat and dispose of a greater waste volume. The no action alternative would continue this situation and thus restrain growth and maintain the present population.

---

* Note: New population estimates recently made by Portland State University place the 1976 population at 2,120.

o *Impact on population distribution.*

Alternatives A-1 and A-2 would allow for a broader distribution of population throughout the service area (Figure 9) and could provide sewerage for any population growth in the area. While there is a long-term potential for growth in that part of the service area surrounding Jacksonville, the immediate and most rapid distribution of growth would probably occur within the Jacksonville urban boundary because: 1) present city zoning allows for residential development; 2) the city is plotted for residential use; 3) Jacksonville has an existing wastewater collection system which would allow for almost immediate hookup; 4) present zoning surrounding Jacksonville allows only for density of one dwelling unit per five acres; 5) the area surrounding Jacksonville is not sewered; and 6) sewering at the present zoning would probably be too costly to implement.

Changes in zoning classification in parts of the service area outside Jacksonville could accelerate the rate of development in this area. Such a zoning change would be the only means of achieving a population of 12,410 (population capacity of the interceptor) since under the present zoning only a maximum of 4,323 people could reside in the area. Although the extent of rezoning is unknown at this time, one can presume that at some time in the future, it could result in the population shown above. The size of the present population in this part of the service area is estimated to be 500 people.

With Alternatives C, C-1 and C-2, a majority of future growth in the service area will be within the city limits and the designated urban growth area. At a future time when buidable land is eliminated in Jacksonville, growth outside of the city limits will probably accelerate.

Alternative C-1a will result in the maintenance of the existing population distribution within the City of Jacksonville. Because the population will not expand, the buildable land within the city limits will remain as open space. While this alternative would have a major impact on the population distribution of the City of Jacksonville, it will have only a minor effect on the area surrounding the city. Population growth in that area could still occur whether or not Alternative C-1a is implemented.

Alternative D essentially limits any new development in Jacksonville. Surrounding areas that can support a subsurface (septic tank and leach field) system could continue to increase population in response to other growth stimulants. Development will probably occur wherever soils and slope are not limiting to septic systems and land splits occur to bring parcel size into the 5-10 acre range.

All alternatives will require Jacksonville to expand its other city services. Expanded population will call for expansion of water, police and fire services. There is, for example, a 4-hour period during the night in which there are no police on duty. Fire protection will have to be expanded in terms of both men and equipment. Insofar as growth will probably mean a higher per household occupancy, per capita increases in taxes for Jacksonville are anticipated.

Land Use.

o *Impact on land use patterns.*

The major impact upon land use in the Jacksonville area relates to increased residential growth. Jacksonville presently attracts many retired individuals, and people in the 30 to 40-year age category comprise the bulk of the commuting populations. With the construction of a new waste disposal system, sewerage will no longer represent a constraining factor.

The greatest potential impact on land use would derive from tie-in with Bear Creek Valley Sanitary Authority. Sewerage for lands outside of Jacksonville could result in zone changes permitting denser residential development on these lands. Conceivably, this could affect the rate of growth in Jacksonville by transferring some of the basic residential growth potential to the outlying lands.

Alternative A would aid in turning vacant and other lands already planned for such use into residential and commenrcial lots or other developments. While 22 percent of the area of Jacksonville is in vacant lands, not all of this is usable. There are some vacant lands north of the downtown area that are relatively flat and could be developed rather easily and economically. Others are not as suitable for development, and unless land use constraints are overcome, these lands will likely remain undeveloped. Because of the combined land use changes in Jacksonville and the surrounding service area, Alternatives A-1 and A-2 are considered to have the greatest impact.

Although restrictive zoning is now in effect on agricultural lands surrounding Jacksonville, there will probably be a continued diminution that will probably happen regardless of any wastewater treatment. Presently, there are some large agricultural parcels for sale around Jacksonville, but because of soil limitations, they have been for sale for quite some time. The sale price and taxes vs. possible use will ultimately determine the future of these parcels.

While the capacity of the interceptor system in Alternatives A-1 and A-2 is such that substantial population growth could occur within the service area, it is unlikely that this growth will occur in the prime agricultural lands east of Jacksonville. The LCDC has a policy and guidelines relating to the preservation of agricultural land. Both the City of Jacksonville and Jackson County are directing their planning effort toward identifying and preserving agricultural lands.

Other land use changes occurring because of a growing population and residential developments will be the growth of commercial enterprises and the possibility of some light industrial operations. The degree of development of surrounding land, as well as that in Jacksonville is expected to influence commercial development. Accordingly, even under strict zoning regulations, Jacksonville may have some problems preserving its historical quality unless it maintains a ceiling limitation on commercial and industrial operations. If historical preservation does not keep pace with other growth, it is expected to be diminished in importance.

Alternatives B, C-1 and C-2 will not have the immediate impact of Alternative A upon land use practices outside the Jacksonville service area. Alternative B, the tie with the U. S. Forest Service seedling farm, will have impacts upon land use depending upon additional land requirements for the winter time storage of effluent and the siting of the 11,200-foot line. Presently, the Forest Service is not certain of its actual water quantity and quality needs for irrigation and/or frost protection. Although it has irrigation rights, use intensities may change in the future, thereby requiring Jacksonville to store wastewater if less is needed at any particular time. The total concept of the alternative is to recycle resources by putting treated effluents into a beneficial use.

Alternative C-1a (no growth) will have a major impact on the land use patterns within the City of Jacksonville. In essence, this alternative will result in the maintenance of existing uses. The present mix of residential, commercial and agricultural uses is likely to remain. This alternative, however, will have little impact on the future use patterns of lands outside the Jacksonville city limits.

Land Use Planning.

o *Impact on land use planning.*

Very little change is anticipated countywide in terms of zoning or land use practices, regardless of alternative selection. The county is considering taking steps to zone lands between Medford and Jacksonville under a more restrictive agricultural designation in order to assure its continued open character. The City of Jacksonville is in the process of preparing a more comprehensive general plan and framework.

The county zoning pattern to the west of Medford is designated Farm Residential (F-5) which has many permitted and conditional uses and which, for the most part, provides for an area where agriculture can be operant without intrusion by conflicting uses. The county intends to maintain, if not improve, this zoning requirement.

Because of the large service area involved, Alternative A-1 and A-2 will require an immediate planning effort in order to assure a proper and controlled direction of growth. Although contemplated changes in zoning are not reported, one must assume that social-political pressures will increase to rezone the areas outside of Jacksonville for residential use.

According to the goals and guidelines of LCDC, an urban growth limit must be identified by the Cities of Jacksonville and Medford. This limit allows for urban development of less than 1 acre/dwelling unit within the boundary. The development of the service area surrounding Jacksonville to accommodate a population of 12,410 people would be contrary to efforts to identify an urban growth limit.

The maintenance of present zoning (1 dwelling/5 acres) would ensure that urban growth limits would be maintained.

Alternatives B, C-1, C-1a and C-2 are not expected to significantly impact the present course of zoning and land use planning because the area of effect is generally restricted to Jacksonville. If no action is taken then the city must continue to dispose of its effluent into Daisy Creek and to find a solution to lift the DEQ moratorium on building permits. The present course of planning for the community is not predicated on almost zero growth, thus the selection of this alternative would probably require new planning objectives. Because the city must serve its present and anticipated population adequately, the choice of no action would have a great impact on community planning.

Traffic.

o *Impact from traffic and circulation patterns.*

A secondary impact of sewerage facility development and subsequent residential development will be an increase in traffic loads on the road systems within, entering and leaving Jacksonville.

Daily traffic loads within the center of Jacksonville often create problems and conflicts with other activities. Present highway development plans indicate that a bypass of Highway 238 is planned north of the City of Jacksonville. Such a bypass would greatly reduce through-traffic loads in the center of the city.

Any future population growth within and adjacent to the city will create additional traffic problems, particularly along main roads such as Fifth Street, California Street and South Stage Road.

Even with the no growth alternative (C-1a), traffic problems are likely to increase in Jacksonville due to projected increases in tourist traffic and as a consequence of travel by Jacksonville residents.

Water Supply.

o *Impact on available water supply.*

The City of Jacksonville is presently facing the problem of an inadequate water supply and distribution system. The 8-inch pipeline now supplying Jacksonville storage reservoirs will require upgrading in order to properly handle the demand.

Future population growth in Jacksonville will require an adequate water supply. Although the city presently derives its water from the City of Medford, increasing demand for water from that source may make future procurements difficult, particularly if substantial population growth occurs in portions of the West Medford and Westside Trunk Districts to the east and north of Jacksonville.

The water supply and distribution system will require upgrading, even with the no growth alternative (C-1a), because of the present inadequacy of the system. Coupled with this problem is the likelihood of an increase in per capita consumption of water.

Quality of Life and Social Well-Being.

o *Impact on the quality of life.*

Any development to serve the needs of existing and future populations of an area should be considered with respect to its long-range impacts upon the quality of life and social well-being of the population of Jacksonville.

One of the major difficulties in all stages of planning arises through attempts to mirror the community's preferences and attitudes.

Quality of life, or a general state of happiness or contentment, is defined here as a subjective degree of satisfaction or dissatisfaction regarding the totality of a person's existence. Social well-being, a person's state of health, economic condition, etc., implies an objective and specifiable measure of a person's life situation. Quality of life and social well-being are quite different phenomena; one may increase to the detriment of the other (cf. Smith, 1973; and Hogg and Honey, 1976).

During the course of preparation of this EIS, inferences were drawn from the several short conversations with individual citizens and their notions of the quality of life in Jacksonville, and from observations in the field.

It is inevitable that a replacement wastewater system, regardless of the alternative selected, will mean growth for the city. If growth can be reasonably managed, then the residents of Jacksonville could possibly sustain a fairly harmonious balance between their present quality of life and social well-being. If, for example, the city is annexed by BCVSA and growth occurs randomly and rapidly, the situation may be the reverse. While social well-being might be enhanced, quality of life could be impaired. Although commercial and residential expansion may increase the social well-being for a few persons, the overall quality of life for most could diminish. For a segment of the population, diminished quality would mainly occur from the city losing its historical integrity. The chief short-term, economic beneficiaries would be the owners of undeveloped land, operators of commercial outlets, and other investors within the primary service areas.

All situations that deal with long-range planning efforts call for a close scrutiny of quality of life and social well-being factors. In this case, Medford's growth is also a consideration. As Medford grows and expands its industrial and commercial base and attracts people for employment, more individuals may seek out Jacksonville and the surrounding area as a residential escape from the urban setting.

o *Impact on historical value and integrity.*

Growth in Jacksonville and the surrounding service area, for all practical purposes, is certain to occur. When and at what stage of population growth an adverse impact can be expected on the historical quality of the city is now indeterminable. However, in all likelihood, the historical character of Jacksonville will still remain as a focal point when the population reaches 5,300 at about 1997.

The maintenance of the small-town character of Jacksonville and its registered historical sites will be determined to the greatest extent by the direction and type of population growth. The city now has distinct boundaries and is the focal point for Highway 238 travelers from Jacksonville or Grants Pass. This is maintained by the open space surrounding the city.

With Alternatives A-1 and A-2, there is a greater potential for growth in and around Jacksonville because of the large capacity of the interceptor system. The degree to which this growth is realized will be dependent on factors such as zoning, economics, desirability of settlement, and the availability of support services such as water.

Because of the smaller capacity of facilities under Alternatives B, C-1 and C-2, the impact on the area's historical value is likely to be less. However, even these alternatives could adversely affect the historical quality of the area if direction is unregulated or if Jacksonville loses its boundaries by encompassing urban growth in the county.

The opportunity to maintain the historical value and integrity of Jacksonville will be present with Alternative C-1a (no growth). Because the population will be maintained at its present level, population growth of the City of Jacksonville will be less of a factor in adversely affecting historical quality.

o *Impact on Jacksonville as an historic landmark.*

The impacts of alternatives on the status of Jacksonville as a National Historic Landmark are quite indirect. It is unlikely that the official and legal designation of the community will not be affected, unless the present historical features are allowed to go into decline, or are removed as a result of residential or commercial development.

The impact instead, will come in terms of the creation of any imbalance of residential-commercial growth and historical preservation. People presently feel that the amount of preservation is in balance (Haynes and Cox, 1974), and are not strongly committed to the idea of increasing expenditures for greater preservation. Residential and commercial growth therefore, especially that to be stimulated by Alternatives A-1 and A-2, are likely to diminish the relative significance of that preservation which has already occurred.

Cumulative Effects.

- *Cumulative impacts of the Jacksonville project associated with BCVSA.*

Although the City of Jacksonville and the BCVSA are considered separate legal entities, the effect of providing sewerage service will not be limited to the City of Jacksonville Sanitary Authority boundaries, but instead will have an impact on each other.

The BCVSA is now preparing an EIS on providing sewerage service to the 5,200-acre Westside Trunk District, which lies north of the City of Jacksonville and the West Medford Trunk District. Although the District contains only 500 residences (approximately 2,000 people), projections call for rapid growth over the next 50 years. While present zoning and the comprehensive plan allow for a total buildout population of 9,000 people, projections indicate that by the year 2000 the district will contain 6,200 people and by the year 2026, 17,300 people, with more than 8,000 of that population inhabiting the southern portion of the district.

The increase in population of Jacksonville, the West Medford Trunk District, and the Westside Trunk District will also increase traffic loads on existing roads and eventually will require that surface streets and main arteries be upgraded to support the additional use.

Increases in population will create a demand for utilities -- electricity, water and natural gas -- and for community services in the area -- police and fire protection, street maintenance, and solid waste collection and disposal. Because of increasing demand (by Jacksonville and by some parts of the Westside Trunk District) water may become a particularly important factor in the future growth and development of the area. There will likely be an increase in school enrollment.

Changes in land use will occur within the trunk districts and in Jacksonville. Land now as open space and covered with natural vegetation or agricultural crops and supporting wildlife species will be changed to a residential land use. Other areas of open space may become commercial.

Financial Impacts

The following list indicates those financial impacts to be discussed in the subsequent text.

- Project financing
- Related financial effects
- Property values
- Building construction

Project Financing.

o *Impact of project financing.*

Data provided T. Flatebo and Associates constitute the basis for evaluating financial impacts of the various alternatives. Analyses of local costs vs. total costs are presented in Appendix C.

Table 22 identifies the projected cost per month per connection and the likely assessed valuation per $1,000 for 1977, 1987 and 1997.

Costs per month will be low for all alternatives because the sewage collection system (which typically represents a major expense) is already installed.

Related Finances.

o *Related financial impacts.*

Other city services must keep pace with sewer program development if inordinate future costs are to be avoided. The city's water system is cited as barely adequate for residential needs and inadequate for fire protection. Expansion and renovation of schools will be needed and new requirements for storm sewers and sidewalks will be generated as a consequence of population gains. Factors affecting public finance will be equivalent to real and anticipated population growth plus adjustments for inflation and interest.

Table 22

PROJECTED MONTHLY COST PER CONNECTION AND
ASSESSED VALUATION FOR THE VARIOUS ALTERNATIVES

Item	Date	Alternatives					
		A-1	A-2	B	C-1	C-1a	C-2
Monthly cost per connection	1977	$3.80	$3.66	$1.73	$1.34	$1.08	$2.26
Assessed valuation per $1,000	1977	0.83	0.83	0.82	0.44	0.30	0.36
	1987	0.45	0.45	0.45	0.24	0.16	0.19
	1997	0.31	0.31	0.31	0.17	0.11	0.13

The city's tax base will probably have to be expanded from its present $1.83 per thousand dollars of property value. Present underdeveloped services will require expansion for any projected population increase in Jacksonville. Either greater densities of people, markedly higher valued property, or an increased tax rate will be required. To serve the anticipated growth, a combination of these circumstances will be necessary in order for the costs per connection to be relatively stable.

Property Values.

o *Impact on property values.*

Property valuation has increased dramatically in Jacksonville since 1971. The total assessed valuation of residential and commercial property in that year was 7.21 million dollars compared to a 1976 valuation of 17.9 million dollars. The valuation increase in this period thus amounts to over 10 million dollars and an increase of 148 percent. A decrease in rates per $1,000 valuation has occurred over the same period but by no means to the same extent. Rates in 1971 were $5.57 per $1,000 valuation and in 1976 the rate was $1.83 per $1,000 valuation (City of Jacksonville), a decrease of 67 percent. Relative taxes[1/] per $1,000 valuation therefore have decreased by nearly 50 percent, or by slightly over 7 percent per annum since 1971.

Decreases in tax rates per $1,000 valuation may not continue to occur at the same rate relative to total assessed valuation increases. Table 23 shows city revenues since 1969 as a result of the inverse trends.

The data in Table 23 show no dramatic per capita property tax increases in Jacksonville in the past five years. City revenue from residential taxes has decreased by 17.2 percent over the same period. The number of Jacksonville's commercial accounts has decreased by 18 percent since 1971, while the number of residential accounts has increased by 25 percent.

Determining the impacts of the various alternatives on property values is difficult and at the best judgmental. In all likelihood, the availability of sewerage facilities as provided by Alternatives A-1, A-2, B, C-1, C-1a and C-2 will result in an increase in property values throughout Jacksonville. Property values would probably increase more under Alternative C-1a because no growth would, in essence, create a "sellers market". The influence of a "building moratorium"

Table 23

Year	City Revenue from Residential Taxes	City Residential Taxes Per Capita
1971	$33,825	$19.00
1972	23,940	12.50
1973	26,564	13.42
1974	25,775	12.45
1975	36,537	17.78
1976	28,012	13.53

Residential and commercial tax assessment data provided by Jackson County Department of Assessment and Taxation

by DEQ has been clearly evident. Property values have increased and housing is in great demand. Such would also be the case under Alternative C-1a. No growth would provide assurances of a small-town atmosphere in close proximity to a growing commercial and residential area.

With Alternatives A-1, A-2, B, C-1 and C-2, property values will also increase, but probably at a slower rate than they would under C-1a.

In all probability, property valuation assessments would increase in response to the market value of the property and the greater services needed as populations increase.

Building Construction.

o *Impact on building construction.*

Under present conditions, residential and commercial construction is constrained in Jacksonville. This is due to the present restrictions that DEQ placed on sewer hookups.

All of the project alternatives, A-1 through C-2, will provide sewage treatment and disposal facilities adequate to remove the hookup restrictions. The lifting of the hookup ban will result in the completion of homes in which construction was started but not completed due to the ban, and an increase in the number of new housing starts.

Alternative D (no action) will lead to a continuation of present restrictions and the virtual elimination of housing starts except for those where soils are suitable for installation of subsurface (septic system) disposal systems.

Ability of Alternatives to Meet Project and Environmental Objectives

Project Objective. As stated in the introduction, the overall project objective is to "Provide an institutionally acceptable wastewater disposal system for the citizens of Jacksonville". This requires compliance with all environmental and social-economic policies and standards of Oregon and the Environmental Protection Agency that pertain to wastewater treatment and disposal. All project alternatives (A-1, A-2, B, C-1, C-1a and C-2) are proposed to be institutionally acceptable alternatives. Insofar as is known, each alternative can be implemented and meet the NPDES permit requirements. Alternatives B, C-1, C-1a and C-2 must be designed to prevent treated sewage from entering surface waterways or contaminating groundwater.

Alternative D (no action) would be unacceptable because of the inability of Daisy Creek to assimilate wastewater during the low flow months.

Table 24 shows how alternatives compare with each other in meeting this project objective.

Environmental Objectives. Four environmental objectives were identified in the introduction:

1) Minimize the adverse environmental effects of wastewater treatment and disposal.

Alternatives A-1 and A-2 represent the two alternatives that best meet this objective. The placement of 7,200 feet of pipeline along existing roadways and on disturbed land will have a minor short-term impact on the service area environment. In the long term, urban development in the service area could convert significant portions of agricultural and open land to other uses.

Alternatives B, C-1 and C-2 are second best due to the greater length of the pipelines of B and C-2 and the potential for soils and groundwater problems from wastewater application.

2) Minimize the social-economic costs of wastewater treatment and disposal.

Table 24

COMPARATIVE EVALUATION RELATING PROJECT ALTERNATIVES TO PRPJECT AND ENVIRONMENTAL OBJECTIVES

	A-1	A-2	B	C-1	C-1a	C-2	D
Project Objectives:							
Provide an institutionally acceptable wastewater disposal system for the citizens of Jacksonville.	1	1	2	2	2	2	4
Environmental Objectives:							
Minimize the adverse effects of wastewater treatment and disposal.	1	1	2	2	2	2	4
Minimize the social-economic costs of wastewater treatment and disposal.	3	3	1	1	1	2	4
Provide for the reuse of treated wastewater.	4	4	1	1	1	3	4
Maintain the historical quality of Jacksonville.	3	3	2	2	1	2	1

LEGEND:

1 Best

2 Second best

3 Limited

4 Fails

With any project that becomes the responsibility of the citizens of a community and a tax-supported service, there is a need to minimize social and economic costs. None of the alternatives will represent major tax burdens on the present or projected populations of Jacksonville. The major differences between the alternatives selected to meet this objective lie in the potential for population growth (Table 24).

3) Provide for the reuse of treated wastewater.

Alternatives A-1 and A-2 will not allow for the direct reuse of treated wastewater, while Alternatives B, C-1 and C-1a would permit such a use for tree farm spray irrigation and irrigation of alfalfa. Alternative C-2 would permit the spray disposal of wastewater with limited opportunity for direct reuse (Table 24).

Alternative D would not provide for reuse of wastewater.

4) Maintain the historical quality of Jacksonville.

This is a very broad objective which relates to more than the influencing factors of the sewage treatment system. The major influencing factor will be associated with the rate and direction of population growth in Jacksonville and surrounding lands.

Because of the land use planning and other influencing factors involved, it is questionable to what degree the historical quality of Jacksonville will be affected.

Alternatives C-1a and D will have the least effect on historical quality because each will represent limitations on population growth.

Under all alternatives, population growth could affect the historical values of Jacksonville from outside the city limits, regardless of which avenue the city chooses to take in terms of future population growth.

V. UNAVOIDABLE ADVERSE IMPACTS

The unavoidable adverse impacts of the various alternatives are summarized in Table 25 and as follows.

Alternative A-1 - Annexation to BCVSA

There will be no major long-term impacts to the physical or biological resources resulting from the actual construction of the pipeline from Jacksonville to BCVSA. The major impacts on these resources will result secondarily from the subsequent development of vacant lands, both within the Jacksonville city boundaries and in the service area surrounding the city. Major social impacts include increased population, changes in land use quality, detraction from the historical character and aesthetic quality of Jacksonville, increased traffic resulting from growth effect on regional air quality and increased costs of sewage and other public services.

Alternative A-2 - Lease from BCVSA

The impacts of this alternative would be the same as those associated with Alternative A-1. Costs of this alternative will be slightly less than those in Alternative A-1.

Alternative B - Wastewater Application on U. S. Forest Service Land

The potential impacts on archeological resources represent a major concern, while effects on groundwater vegetation and wildlife and air quality will be moderate. Minor impacts include flood hazards, soils, odor, air quality, rare and endangered species, vegetation and aesthetics. This alternative accommodates less growth than Alternatives A-1 and A-2 and represents the least costly of the alternatives.

Alternative C-1 - Irrigation of Crops

This alternative will potentially result in a moderate impact on local groundwater. The impacts on flooding, soils, odor, vegetation, wildlife and aesthetics will be minor.

Table 25

ENVIRONMENTAL SUMMARY OF LONG-TERM IMPACTS OF PROJECT ALTERNATIVES FOR JACKSONVILLE WASTEWATER DISPOSAL

	Alternatives						
	A-1	A-2	B	C-1	C-1a	C-2	D
Impacts	BCVSA Annexation	BCVSA Lease	USFS Nursery	Crop Irrigation	Crop Irrigation (No Growth)	Landfill Spray Disposal	No Action
Improve stream water quality	B	B	B	B	B	B	0
Reduce flows in Daisy Creek	U	U	U	U	U	U	0
Impact groundwater	0	0	Δ	Δ	-	-	0
Flood and geologic hazard	0	0	-	-	-	-	0
Impact on soils from wastewater application	0	0	-	-	-	-	0
Odor	0	0	-	-	-	-	+
Regional air quality	Δ	Δ	Δ	Δ	-	Δ	0
Vegetation and wildlife loss	-	-	Δ	-	-	Δ	0
Rare and endangered species	0	0	0	0	0	0	0
Effects on natural vegetation from application of wastewater	0	0	0	0	0	-	0
Aesthetics	Δ	Δ	-	-	-	-	0
Potential impact on archeological resources	0	0	+	0	0	0	?
Consumptive use of energy	U	U	-	Δ	Δ	+	0
Population size	Δ	Δ	Δ	Δ	-	Δ	+
Population distribution	+	+	Δ	Δ	+	Δ	-
Land use patterns	Δ	Δ	-	-	+	-	-
Land use planning	-	-	-	-	-	-	+
Traffic and circulation patterns	Δ	Δ	Δ	Δ	-	Δ	-
Water supply	Δ	Δ	Δ	Δ	-	Δ	-
Quality of life	U	U	U	U	U	U	U
Impact on historical integrity	Δ	Δ	-	-	-	-	0
Impact on historic landmark	0	0	0	0	0	0	0
Project financing	Δ	Δ	Δ	Δ	Δ	Δ	0
Property values	U	U	U	U	U	U	U
Impact on building construction	B	B	B	B	+	B	+

LEGEND

+ Major impact
Δ Moderate impact
- Minor impact
0 No impact
B Beneficial impact
U Unknown

Alternative C-1a - Irrigation of Crops (No Growth)

The short-term, adverse impacts of this alternative will be of minor consequence. Because of the low quantity of wastewater to be applied, the impacts of local groundwater will be minor, as will be the impacts on soils, flooding, odor, vegetation and wildlife. Because of the no growth nature of this alternative virtually all impacts will be of less consequence than those of other alternatives.

Alternative C-2 - Spray Disposal Above the Landfill Site

Impacts on groundwater, soils, air quality, natural vegetation and aesthetics will be minor. There will be a minor potential for flood or geologic hazards. A moderate impact will occur on vegetation and wildlife as a result of pipeline construction. Socio-economic impacts will be minor.

Alternative D - No Action

Adoption of the no action alternative would continue to result in violation of the Environmental Protection Agency and DEQ wastewater discharge requirements, would result in continuous odor problems with the existing lagoon system, and bans on hookups to the sewerage system would be continued.

VI. LOCAL SHORT-TERM USES OF THE ENVIRONMENT VS. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The present discharge of inadequately-treated wastewater into Daisy Creek represents a short-term use that adversely affects the long-term productivity and value of Daisy Creek, its beneficial uses and its receiving waters.

The principal beneficial effect on surface water of using Alternatives A-1 through C-2 is the alleviation of water quality impairment related to the discharge of inadequately-treated wastewater to Daisy Creek.

Alternative D (no action) would allow for the continuation of this problem and impairs the use of Daisy Creek for any beneficial uses.

While Alternatives A-1 through C-2 would remove the adverse water quality problem, new impacts would result from the construction of a waste treatment system. These impacts relate to increased taxes and service charges, increased consumption of natural resources and the likelihood of a greater population growth within the City of Jacksonville and surrounding area.

The implementation of either Alternative A-1, A-2, B, C-1 or C-2 would represent a tradeoff for meeting waste discharge requirements while providing for a varying level of future population growth since all of the above alternatives are designed to support additional growth. For Alternatives A-1, A-2, B, C-1 and C-2, Jacksonville will be committed to a population growth of approximately 7 percent per annum. In addition, the rural service area surrounding Jacksonville will be committed to a growth rate which will be dictated in part by land use and zoning decisions set forth by state and local governing bodies.

Alternative C-1a represents a provision for maintenance of the present population and historic character of Jacksonville, with a commitment to established land use patterns and population distribution within the city limits.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

With all alternatives except no action, there will be minor and major irreversible and irretrievable commitments of renewable and non-renewable resources. Significant commitments of general irrecoverable resources, i.e., time, building materials and energy, will be required during construction of any of the treatment alternatives.

After construction, operation of the treatment plant will require irrecoverable resources such as time, chemicals, energy and maintenance materials.

The secondary effects of population growth will result in the conversion of open, natural land to urban development, reduction in air quality, increased use of water, electricity, petroleum products, timber and food, and increased demand for social services. If growth occurs in a reasonably well conceived manner, none of these effects are forecasted to be significantly adverse.

VIII. UNRESOLVED ISSUES

During the course of this environmental impact analysis, it became clear that there are numerous questions and issues relative to the Jacksonville wastewater treatment project. Several important issues were identified in the introduction of this report and analyzed and discussed further throughout the report. Issues that could be dealt with in the facilities planning activity were addressed. Resolutions to several of the issues are institutional rather than technical and they must await further political and social action. The following important issues must be dealt with by the responsible city, county and/or state officials having responsibilities in Jacksonville and Jackson County.

1. An unresolved question relates to the definition of a reasonable population projection for the City of Jacksonville. This cannot be established until the following information is collected: 1) a current land use survey of the city on contiguous urban growth area showing current residential densities; 2) a buildable land survey of this area to find out potential infilling capacity for residential uses; and 3) the current and proposed water supply capacity of the water system.

2. How would the population capacity of the BCVSA interceptor in Alternatives A-1 and A-2 relate to the ultimate allowable population (based on the Jackson County Comprehensive Plan) in the West Medford Trunk District surrounding Jacksonville?

IX. BIBLIOGRAPHY

References

Baldwin, E. M. 1964. Geology of Oregon. University of Oregon, Edwards Brothers, Inc. 165 pp.

Beckham, S. D. 1971. Requiem for a people - the Rogue Indians and the frontiersmen. University of Oklahoma Press, Norman.

Berreman, Joel V. 1937. Tribal distribution in Oregon. Memoirs of the American Anthropological Association. No. 47.

Bertrand, G. A. and J. M. Scott. 1973. Checklist of the birds of Oregon. Oregon State University, Museum of Natural History. 17 pp.

Burcham, M. B. 1940. Scott's and Applegate's old south road. Oregon Historical Quarterly, 41(4): 405-423.

Burt, W. H. and R. P. Grossenheider. 1952. A field guide to the mammals. Houghton Mifflin Co. 200 pp.

Cline, G. G. 1974. Peter Skene Ogden and the Hudson's Bay Company. University of Oklahoma Press, Norman.

Colvig, W. M. 1906. Indian wars in southern Oregon. Oregon Historical Quarterly, 4(3): 227-240.

Cressman, Luther. 1933. Aboriginal burials in southwestern Oregon. American Anthropologist, new series vol. 35.

----------. 1933. Contributions to the archaeology of Oregon: final report on the Gold Hill burial site. University of Oregon Studies in Anthropology, bulletin 1, no. 1.

Davis, Wilbur. 1964. Archaeological survey of Crater Lake National Park and Oregon Caves National Monument, Oregon. Report submitted to the National Park Service. University of Oregon, Eugene.

----------. 1968. Archaeology of the Lost Creek Dam Reservoir. Final report to the National Park Service. MS, Corvallis.

----------. 1970. Lost Creek archaeology, 1968. Final report to the National Park Service. MS, Corvallis.

----------. 1974. Lost Creek archaeology, 1972. Final report to the National Park Service. MS, Corvallis.

Farnum, W. D. 1956. The development of an Oregon County, 1852-1890: mines, farms and a railroad. Pacific Historical Review, 25(1): 29-46.

Franklin, J. F. and C. T. Dryness. 1969. Vegetation of Oregon and Washington. U. S. Forest Service research paper PNW80. 216 pp.

Gaston, J. 1906. Genesis of the Oregon railway system. Oregon Historical Quarterly, 7(2): 105-132.

Gill, F. B. 1924. Oregon's first railway. Oregon Historical Quarterly, 25(3): 171-235.

Haines, F. D. 1959. The Jacksonville Cannonball: the history of the Rogue Valley Railway, 1890-1925. Pacific Northwest Quarterly, 50(4): 144-154.

Haynes, M. C. and K. Cox. 1974. An economical-statistical analysis of citizen attitudes with regard to city services, growth, historical preservation and tax revenues in Jacksonville, Oregon. Unpublished research activity, Southern Oregon College, Ashland (mimeographed).

Hogg, T. C. and W. D. Honey. 1976. Dam the river: the proposed Days Creek Dam and the human ecology of the South Umpqua River Basin, Oregon. Dept. of Anthropology, Water Resources Research Institute, Oregon State University, OWRRI #43, Corvallis (in press).

Jackson County. 1968. A plan for parks and recreation, Jackson County.

Jackson County. Planning Commission. 1972. A summary of the comprehensive plan for Jackson County, Oregon. Jackson County Department of Planning and Development, Medford.

----------. 1973. Zoning ordinance for Jackson County, Oregon. Jackson County Department of Planning and Development, Medford.

----------. 1976. Jackson County comprehensive plan, Jackson County Department of Planning and Development, Medford (map).

Jacksonville (City of). [n.d.] General plan (mimeographed).

----------. 1969. Demographic data (mimeographed).

----------. 1976. Part A - Facilities plan, municipal waste treatment works, draft copy. Compiled by T. Flatebo and Associates, Jacksonville.

Johansen, D. O. and C. M. Gates. 1957. Empire of the Columbia - a history of the Pacific northwest. Harper and Brothers, New York.

Maloney, A. B. 1940. Camp sites of Jededian Smith on the Oregon coast. Oregon Historical Quarterly, 41(3): 305-323.

Metcalf & Eddy Engineers. 1976. Report - hand application of wastewater in the Salinas-Monterey Peninsula area.

Mullen, J. 1906. From Walla Walla to San Francisco, 1862. Oregon Historical Quarterly, 4(3): 202-226.

Nunis, D. B. (ed). 1968. The Hudson Bay Company's first fur brigade to the Sacramento Valley: Alexander McLeod's 1829 hunt. Sacramento Book Collector Club, Sacramento.

Oregon (State of). 1974. Population projections for Oregon. Economic Services Section, Salem.

----------. 1974. Resource atlas, Jackson County, Oregon. Oregon State University Extension Service, Corvallis, prepared by Marilyn Ruttle.

----------. 1976. Labor force trends, Jackson County, Oregon. Department of Human Resources, Employment Division (mimeographed).

Oregon. Bureau of Municipal Research and Service. 1964. Employment forecast 1962-1985, Jackson County, Oregon. University of Oregon, Eugene.

----------. 1964. Industrial land use, Bear Creek urban region, Jackson County, Oregon. University of Oregon, Eugene.

----------. 1958. Population of Oregon cities, counties and metropolitan areas 1850-1957, a compilation of census counts and estimates in Oregon. Information Bulletin 106, University of Oregon, Eugene.

Oregon. Department of Environmental Quality. 1976. Proposed water quality management plan for Rogue River Basin. 74 pp.

Oregon. State Highway Division. 1976. Preliminary six year highway improvement program - July 1, 1976 to June 30, 1982.

Oregon. State Water Resources Board. 1969. Oregon's long-range requirements for water: general soil map report with irrigable areas Rogue drainage basin. Agricultural Experiment Station, Oregon State University and U. S. Soil Conservation Service.

Palmer, Joel. 1847. Journal of travels over the Rocky Mountains to the mouth of the Columbia River made during the years 1845 and 1846..., J.A. and U.P. James, Cincinnati. Reprinted in Early Western Travels 1748-1846, vol. 30, AMS Press Inc. New York, Rueben Thwaites, ed.

Peterson, R. T. 1961. A field guide to western birds. Houghton Mifflin Company. 309 pp.

Sargent, A. A. 1921. A sketch of the Rogue River Valley and southern Oregon history. Oregon Historical Quarterly, 22(1): 1-11.

Sapir, Edward. 1907. Notes on the Takelma Indians of southwestern Oregon. American Anthropologist, new series, 9:2.

Schaeffer, Claude. 1959. Indian tribes and languages of old Oregon country. Map prepared for the Oregon Historical Society.

Scott, L. M. 1917. The pioneer stimulus of gold. Oregon Historical Quarterly, 18(3): 147-166.

Smith, C. L. 1973. Social well-being: problems and prospects, draft prepared for the conference on "The social well-being--quality of life dimensions in water resources and development". Logan, Utah (mimeographed).

Stebbins, R. C. 1966. A field guide to western reptiles and amphibians. Houghton Mifflin Co. 279 pp.

Stevens, Thompson & Runyon, Inc. 1973. Jackson County comprehensive areawide water and sewerage plan. 218 pp.

----------. 1973. Solid waste management plan - Jackson County, Oregon.

Sutton, Jack and Lee Pinkham. 1961. The golden years of Jacksonville - a pictorial walking tour. Bulletin Publishing Company in cooperation with the Southern Oregon Historical Society and the Siskiyou Pioneer Sites Foundation, Grants Pass.

Tucker, W. P. 1932. Social history of Jackson County. Oregon Historical Quarterly, 33(4): 313-317.

U. S. Army Corps of Engineers. 1965. Jackson County, Oregon - flood plain information - interim report. Portland, Oregon.

U. S. Department of the Interior. 1973. Population, employment and housing units projected to 1990. Bonneville Power Administration.

U. S. Environmental Protection Agency. 1975. Evaluation of land application systems. Technical Bulletin-EPA-430/9-75-001. 182 pp.

----------. 1976. Compilation of air pollutant emission factors. AP-42, Parts A and B, second edition.

----------. 1973. Recycling municipal sludges and effluents on land. National Association of State Universities and Land-Grant Colleges. 244 pp.

----------. 1973. Survey of facilities using land application of wastewater. Office of Water Program Operations.

U. S. Geological Survey. 1956. Geologic quadrangle maps of the United States - Geology of the Medford quadrangle. Map GQ 89.

U. S. National Oceanographic and Atmospheric Administration. 1975. Climatological data - Oregon. Volume 81.

U. S. Soil Conservation Service. 1974. Land use planning and community development, soils - Jacksonville, Oregon.

Walling, A. G. 1884. History of southern Oregon comprising Jackson, Josephine, Douglas, Curry and Coos Counties. Compiled from the Most Authentic Sources. Published by A. G. Walling, Portland.

Winther, O.O. and R. D. Galey. 1940. Mrs. Butler's 1853 diary of Rogue River Valley. Oregon Historical Quarterly, 41(4): 338-366.

----------. 1950. The old Oregon country - a history of frontier trade, transportation, and travel. Stanford University Press.

----------. 1956. The great northwest, second edition. Alfred A. Knopf, New York.

Personal Communications

Anonymous informants, Jacksonville, Oregon.

Bear Creek Valley Sanitary Authority.

Blankenship, Tom. Oregon Department of Environmental Quality, Portland, Oregon.

Bogar, Larry. Floodplain management, U. S. Army Corps of Engineers, Portland, Oregon.

Carter, Glen. Oregon Department of Environmental Quality, Salem, Oregon.

Cobo, Ted. Rogue River National Forest, U. S. Forest Service.

Gildow, Robert. Oregon Department of Environmental Quality, Portland, Oregon.

Gustafson, Gary. Oregon Department of Land Conservation and Development, Salem, Oregon.

City of Jacksonville, Mayor, City Administrator and Assistant Planner.

Jackson County Department of Planning and Development.

Jackson County Department of Tax Assessment.

Jones, Terry. City of Jacksonville, Planning Department, Jacksonville, Oregon.

Kingsley, Wayne. Rogue River National Forest, Medford, Oregon.

Lilley, Robin. Planner, Jackson County Planning Department, Medford, Oregon.

Ober, Doug. Air Quality Engineer, Department of Environmental Quality, Portland, Oregon.

Oregon State University Extension Service, Jackson County, Oregon.

Schwab, Thomas. Planner, Oregon Department of Highways, Salem, Oregon.

Shay, Ron. Oregon Department of Fish and Wildlife, Portland, Oregon.

U. S. Forest Service.

Vandervelden, Don. District Conservationist, U. S. Soil Conservation Service, Medford, Oregon.

Werner, Richard. Oregon Department of Fish and Wildlife, Roseburg, Oregon.

X. APPENDICES

Appendix A - Biotic Resources

- A-1 Common flora of the Jacksonville area
- A-2 Common terrestrial vertebrates of the Jacksonville, Oregon area
- A-3 Common freshwater and anadromous fish of the study area streams
- A-4 Correspondence from the Oregon Department of Fish and Wildlife

Appendix B - Sewage Flows

Appendix C - Economic Evaluation of Alternatives

- C-1 Local cost
- C-2 Total capital

Appendix D - Water Quality Standards for Rogue River Basin

Appendix E - Cultural Background and History of Jacksonville

Appendix F - Population Projections - City of Jacksonville

Appendix G - Wastewater Analysis by U. S. Forest Service

Appendix H - Compilation of Air Emissions Based on Population and an Index of Annual Average Daily Travel

APPENDIX A

Biotic Resources

Appendix A-1

Common Flora of the Jacksonville Area

Common Name	Scientific Name
Oregon white oak	*Quercus garryana*
Ponderosa pine	*Pinus ponderosa*
Idaho fescue	*Festuca idahoensis*
bluebunch wheatgrass	*Agropyron spicatum*
pine bluegrass	*Poa scabrella*
black oak	*Quercus kelloggii*
Douglas fir	*Pseudotsuga menziesii*
wildrye	*Elymus* sp.
yarrow	*Achillea millefolium*
Oregon ash	*Fraxinus latifolia*
black cottonwood	*Populus trichocarpa*
red alder	*Alnus rubra*
willow	*Salix* sp.
blackberry	*Rubus* sp.
deerbrush	*Ceanothus integerrimus*
white-leaved manzanita	*Arctostaphylos viscida*
poison oak	*Rhus diversiloba*
bigleaf maple	*Acer macrophyllum*

Appendix A-2

Common Terrestrial Vertebrates of the Jacksonville, Oregon Area

Common Name	Scientific Name
Mammals	
Townsend mole	*Scapanus townsendi*
California mole	*S. latimanus*
Pacific mole	*S. orarius*
shrew mole	*Neurotrichus gibbsi*
Pacific shrew	*Sorex pacificus*
vagrant shrew	*S. vagrans*
little brown bat	*Myotis lucifugus*
long-eared myotis	*M. evotis*
Yuma myotis	*M. yumanensis*
California myotis	*M. californicus*
big brown bat	*Eptesicus fuscus*
black bear	*Ursus americanus*
raccoon	*Procyon lotor*
longtailed weasel	*Mustela frenata*
mink	*M. vison*
striped skunk	*Mephitis mephitis*
spotted skunk	*Spilozale putorius*
coyote	*Canis latrans*
bobcat	*Lynx rufus*
California ground squirrel	*Citellus beecheyi*
western gray squirrel	*Sciurus grisens*
deer mouse	*Peromyscus maniculatus*
Oregon vole	*Microtus oregoni*
house mouse	*Mus musculus*
Birds	
great blue heron	*Ardea herodias*
green heron	*Butorides virescens*
black-crowned night heron	*Nycticorax nycticorax*
mallard	*Anas platyrtynekos*
pintail	*A. acuta*
cinnamon teal	*A. cyanoptera*
American wigeon	*Mareca americana*
wood duck	*Aix sponsa*
turkey vulture	*Cathartes aura*
red-tailed hawk	*Buteo jamaicensis*
Cooper's hawk	*Accipites cooperii*
marsh hawk	*Circus cyaneus*
American kestrel	*Falco sparverius*
California quail	*Lophortyx californicus*
ring-tailed pheasant	*Phasiamus colchicus*

Common Name	Scientific Name
American coot	Furlica americana
killdeer	Charadrius vociferus
band-tailed pigeon	Columba fasciata
mourning dove	Zenaidura macroura
barn owl	Tyto alba
great horned owl	Bubo virginiamus
belted kingfisher	Megaceryle alcyon
red-shafted flicker	Colaptes cafer
horned lark	Eremophila alpestris
tree swallow	Iridoprocne bicolor
barn swallow	Hirundo rustica
scrub jay	Aphelocoma coerulescena
common crow	Corvus brachyrhynchos
starling	Sturnus vulgaris
brewer's blackbird	Euphagus cyanocephalus
dark-eyed juneo	Juneo hyemalis oreganus
white-crowned sparrow	Zonotrichia leucophrys

Amphibians

Pacific giant salamander	Dicamptodon ensatus
long-tailed salamander	Ambystoma macrodactylum
rough-skinned newt	Taricha granulosa
ensatina	Ensatina eschscholtzi
tailed frog	Ascaphus truei
boreal toad	Bufo boreas
Pacific treefrog	Hyla regilla
red-legged frog	Rana aurora
bullfrog	Rana catesbeiana
western pond turtle	Clemmyo marmorata

Reptiles

western fence lizard	Sceloporus occidentalis
northern alligator lizard	Gerrhonatus coeruleus
Pacific rubber boa	Charina bottae
Pacific gopher snake	Pituophis melanoleucus
common garter snake	Thamnophis sirtalis
Oregon garter snake	T. couchi
western rattlesnake	Crotalus viridis

Note: For more detailed data on flora and fauna of the Rogue River area, see "Fish and Wildlife Resources of the Rogue River Basin, Oregon and their Water Requirements", Oregon State Game Commission, 1970.

Appendix A-3

Common Freshwater and Anadromous Fish
of the Study Area Streams

Common Name	Scientific Name
Pacific lamprey*	*Lamptera tridentata*
Black-nosed dace	*Rhinichthys atratulus*
Long-nosed dace	*R. sp.*
Redside shiner	*Richardsonius balteatus*
Squawfish	*Ptychocheilus oregonensis*
Coho salmon*	*Oncorhynchus kisutch*
Chinook salmon*	*O. tshawytscha*
Cutthroat trout*	*Salmo clarki*
Steelhead trout*	*Salmo gairdneri*
Buffalo sculpins	*Enophrys bison*
Staghorn sculpin	*Leptocottus armatus*

* Anadromous

DEPARTMENT OF FISH AND WILDLIFE

SOUTHWEST REGIONAL OFFICE

3140 N.E. STEPHENS STREET, ROSEBURG, OREGON 97470 PH. 672-~~6541~~ 7726

ROBERT W. STRAUB
GOVERNOR

July 29, 1976

Mr. Jonathan H. Ives
Jones & Stokes Associates, Inc.
455 Capitol Mall, Suite 835
Sacramento, California 95814

Dear Mr. Ives:

In answer to your letter of July 19, regarding an EIS for the City of Jacksonville on a proposed wastewater treatment facility. There are no "key wildlife areas" such as pristine marshes or primitive lakes nor do I know of any endangered speices that inhabit the area. My main concern as a wildlife manager is the rate at which we are losing our upland gamebird habitat and deer winter ranges to housing developments, concrete highways and in general urban sprawl.

The west hills of Jacksonville is classed as critical deer winter range and the agricultural land to the east of the city is prime pheasant, quail and mourning dove habitat. With the connection of the city of Jacksonville to the BCVSA or the establishment of a large waste water facility, urban sprawl will be accelerated and more game habitat will be lost at a more rapid rate.

Thank you for the opportunity to comment during the preparation of the environmental impact statement.

Sincerely yours,

Richard L Werner

Richard L. Werner
District Wildlife Biologist

APPENDIX B

Sewage Flows

APPENDIX B

SEWAGE FLOW - CITY OF JACKSONVILLE

Month	1973			1974			1975			Notes
	Monthly Total	Average Daily	Monthly Rainfall	Monthly Total	Average Daily	Monthly Rainfall	Monthly Total	Average Daily	Monthly Rainfall	
Jan.	4,082,000	131,698	1.98	9,371,000	302,000	4.32	4,839,000	156,000	2.64	
Feb.	3,484,000	124,428	.54	5,466,000	195,214	2.78	5,666,000	202,000	2.64	
Mar.	3,870,000	124,864	1.58	7,840,000	252,903	3.76	9,052,000	292,000	3.97	
Apr.	3,568,000	118,900	.76	6,175,000	205,030	1.70	5,847,000	195,000	1.27	
May	3,991,000	125,516	.45	4,036,000	130,193	.22	4,460,000	144,000	.24	
June	3,402,000	113,400	.06	3,841,000	128,000	0	4,186,000	139,000	.38	School out
July	3,274,000	105,613	.04	3,583,000	115,806	.10	4,037,000	130,000	.22	School out
Aug.	3,491,000	112,612	.03	3,534,000	114,000	0	4,023,000	129,000	.54	School out
Sept.	3,051,000	101,700	.64	3,406,000	114,000	0	3,446,000	114,000	.65	
Oct.	3,292,000	106,193	2.79	3,222,000	104,000	1.17	3,606,000	116,000	2.21	
Nov.	4,471,000	149,033	7.01	3,834,000	127,000	1.13	4,116,000	137,000		
Dec.	6,524,000	210,451	3.02	3,820,000	123,000	3.91	5,119,000	165,000		

APPENDIX C

Economic Evaluation of Alternatives

Appendix C-1

ECONOMIC EVALUATION OF ALTERNATIVES - LOCAL COST

Item	Interest Factor	A-1	A-2	B	C-1	C-1a	C-2
Total capital cost	1.000	735,000	735,000	730,000	349,500	262,000	317,500
Local share capital cost	1.000	183,800	183,800	182,500	98,600	65,500	79,400
Interest during construction		22,500	22,500	22,400	12,100	9,000	9,700
Salvage value	0.30454	-148,100	-148,100	-46,400	-58,000	-42,500	-29,800
Total present worth		58,200	58,200	158,500	52,700	32,000	59,300
Average annual equivalent cost	0.08807	5,100	5,100	14,000	4,600	2,800	5,200
Annual operation and maintenance		77,900	75,000	35,400	36,000	22,200	46,500
Annual net return from sale of crops		---	---	---	8,500	5,000	---
Total average annual equivalent cost		83,000	80,100	49,400	32,100	20,000	51,700

Appendix C-2

ECONOMIC EVALUATION OF ALTERNATIVES - TOTAL CAPITAL

Item	Interest Factor	A-1	A-2	B	C-1	C-1a	C-2
Capital cost	1.000	735,000	735,000	730,000	349,500	262,000	317,500
Interest during construction	1.000	22,500	22,500	22,400	12,100	9,000	9,700
Salvage value	0.30454	-148,100	148,100	-46,400	-58,000	-42,500	-29,800
Total present worth		609,400	609,400	706,000	348,600	228,500	297,400
Average annual equivalent cost	0.08807	53,700	53,700	62,200	30,700	20,000	26,200
Annual operation and maintenance		77,900	75,000	35,400	36,000	22,200	46,500
Annual net return from sale of crops		---	---	---	8,500	5,000	---
Total average annual equivalent cost		131,600	128,700	97,600	58,200	37,200	72,700

APPENDIX D

Water Quality Standards for the Rogue River Basin

41-080 SPECIAL WATER QUALITY AND WASTE TREATMENT STANDARDS FOR THE ROGUE RIVER BASIN.

(1) Special Water Quality Standards. The provisions of this sub-section shall be in addition to and not in lieu of the General Water Quality Standards contained in Section 41-025, except where this subsection imposes a conflicting requirement with the provisions of Section 41-025, this sub-section shall govern. No wastes shall be discharged and no activities shall be conducted which either alone or in conjunction with other wastes or activities will cause in the waters of the Rogue River Basin:

(a) Organisms of the Coliform Group Where Associated with Fecal Sources (MPN or equivalent MF using a representative number of samples.)

(A) Mainstem Rogue River from the point of salt water intrusion, approximately R.M. 4, upstream to Dodge Park, river mile 138.4, and Bear Creek; average concentrations to exceed 1000 per 100 milliliters, except during periods of high surface runoff.

(B) Rogue River above Dodge Park and all unspecified tributaries, average concentrations to exceed 240 per 100 milliliters, except during periods of high surface runoff.

(b) Dissolved Oxygen (D.O.). Dissolved oxygen concentrations to be less than 90 percent of saturation at the seasonal low, or less than 95 percent of saturation in spawning areas during spawning, incubation, hatching, and fry stages of salmonid fishes.

(c) pH (Hydrogen Ion Concentration). pH values to fall outside the range of 7.0 to 8.5.

(d) Turbidity. (Jackson Turbidity Units, JTU). Any measurable increases in natural stream turbidities when natural turbidities are less than 30 JTU, or more than a 10 percent cumulative increase in natural stream turbidities when stream turbidities are more than 30 JTU, except for certain short-term activities which may be specifically authorized by the Department of Environmental Quality under such conditions as it may prescribe and which are necessary to accommodate essential dredging, construction, or other legitimate uses or activities where turbidities in excess of this standard are unavoidable.

(e) Temperature. Any measurable increases when stream temperatures are 58° F. or greater; or more than 0.5° F. increase due to a single-source discharge when receiving water temperatures are 57.5° F. or less or more than 2° F. increase due to all sources combined when stream temperatures are 56° F. or less, except for short-term activities which may be specifically authorized by the Department of Environmental Quality upon such conditions as it may prescribe and which are necessary to accommodate legitimate uses or activities where temperatures in excess of this standard are unavoidable.

(f) Dissolved Chemical Substances. Guide concentrations listed below to be exceeded except as may be specifically authorized by the Department of Environmental Quality upon such conditions as it may deem necessary to carry out the general intent of Section 41-010 and to protect the beneficial uses set forth in Table 11.

	mg/l
Arsenic (As)	0.01
Barium (Ba)	1.0
Boron (Bo)	0.5
Cadmium (Cd)	0.003
Chloride (Cl)	25.0
Chromium (Cr)	0.02
Copper (Cu)	0.005
Cyanide (Cn)	0.005
Fluoride (F)	1.0
Iron (Fe)	0.1
Lead (Pb)	0.05
Manganese (Mn)	0.05
Phenols (totals)	0.001
Total dissolved solids	100.0
Zinc (Zn)	0.01

(2) Minimum Standards for Treatment and Control of Wastes. All wastes shall be treated, prior to discharge, in accordance with the following:

(a) Sewage Wastes.

(A) During the period of low stream flows (approximately June 1 - October 31 of each year), secondary treatment resulting in monthly average effluent concentrations not to exceed 20 mg/l of 5-day 20° C. Biochemical Oxygen Demand (BOD) and 20 mg/l of suspended solids or equivalent control.

(B) During the period of high steam flows (approximately November 1 - May 31 of each year) a minimum of secondary treatment or equivalent shall be provided and all waste treatment and control facilities shall be operated at maximum efficiency so as to minimize waste discharges to public waters.

(C) All sewage wastes shall be disinfected, after treatment, equivalent to thorough mixing with sufficient chlorine to provide a residual of at least 1 part per million after 60 minutes of contact time.

(D) More stringent waste treatment requirements may be imposed, especially in headwater and tributary streams, where waste loads may be large relative to stream flows.

(b) Industrial Wastes.

(A) Industrial waste treatment requirements shall be determined on an individual basis in accordance with the provisions of Sections 41-010, 41-015, 41-020, 41-025, and 41-030.

(B) Where industrial effluents contain significant quantities of potentially toxic elements, treatment requirements shall be determined utilizing appropriate bio-assays.

APPENDIX E

Cultural Background

by

David Brauner

and

History of Jacksonville

by

Thomas C. Hogg and William D. Honey
Oregon State University

Cultural Background. The first Europeans to enter the Bear Creek drainage basin found the region occupied by a people collectively referred to as the Takelma. The Takelma occupied the upper and middle Rogue River drainage basin and the drainages of the major tributary streams. The single exception was the Applegate Creek drainage inhabited by Athapascan speakers.

The Takelma were most easily distinguished from their neighbors linguistically. The language of the Takelma, referred to as "Takelman" (Berreman, 1937), was a Penutian language unintelligible to Athapascan speakers to the west, other Penutian speakers to the north and east, and Hokan speakers to the south (Berreman, 1937; Sapir, 1907; and Schaeffer, 1959). Takelman speakers were divisible into two groups referred to as the upper and lower Takelma. The distinction was primarily linguistic, i.e., different dialects, but cultural distinctions were apparent (Berreman, 1937; and Sapir, 1907).

The Upland Takelma occupied the Bear Creek drainage basin, territory east of Table Rock to the crest of the Cascades, and the adjacent banks of the Rogue River (Berreman, 1937 and Sapir, 1907). Since the Jacksonville locality was probably inhabited by Upland Takelma prior to the advent of the Euro-American, the following discussion will concern only this group. Unless otherwise cited, the following information was derived from Berreman (1937) and Sapir (1907).

Politically the Takelma were not a tribe. The highest level of political organization achieved was autonomous band organization. The bands were generally small, composed of closely related families. The band leader or headman was selected on the basis of wealth and prestige. The headman was not selected for life nor was the position hereditary. This individual was generally not a peacetime headman.

The pre-European lifeway of the Takelma was dramatically disrupted in the early 1850s. The discovery of gold and secondarily the presence of good agricultural and timberland brought a tidal wave of Euro-Americans into the Rogue River drainage. A number of inexcusable atrocities were perpetrated on the native populations in 1852 and 1853. Any retaliation on the Indian's part was met with even greater brutality by the Euro-Americans. Full-scale war thus resulted between the "Rogue Indians" and Euro-Americans. As a result, aboriginal settlement patterns and social organization were effectively terminated by late 1853. For a detailed account of the plight of the Takelma, see Beckham (1971). Decimated by warfare, the few surviving Takelma were removed to the newly established Siletz Reservation on the Oregon coast in 1855, thus ending over 6,000 years of Native American occupation in the valley of the Rogue.

Among the Takelma social stratification was apparent. Four classes of people were recognized: rich, commoner, poor and slaves. The class system was not hereditary. Everyone except slaves could better his position in life. Marriage was generally band exogamous. Marriages were prearranged between families and a bride price was paid. The sororate and levirate were probably practiced.

Takelma bands were named after the location of their principal winter village. The villages were generally located along the Rogue River or one of its major tributaries. Characteristic of the winter villages were durable semi-subterranean plank houses. The houses were large rectangular structures. Their floors were dug two to three feet below the existing ground surface. The walls were made of upright pine planks supported by four corner posts and cross beams. Most structures had a gable roof with a central smoke hole. Access was gained through a side entryway.

Winter villages were abandoned in the early spring in favor of less permanent upland camp sites. Crude brush structures generally served as shelters in the summer camps.

The central-based, wandering settlement pattern characteristic of the Takelma was dictated by the availability and location of exploitable resources. Acorns, camas and fish were the staple foods of the Takelma. Acorns were gathered in early spring, pulverized and cooked into a meal. Camas roots were gathered during the spring and early summer, baked in earth ovens, and stored as a winter staple. Other favored plant foods included cherries, sunflower seeds, tarweed, madrona and pine nuts. A form of tobacco was apparently cultivated by the Takelma and smoked.

The principal sources of protein for the Takelma were the salmon and trout. Fish could be taken in large quantities during the late summer and fall in the various river systems. Fish were taken in nets, speared and caught with hook and line. Crawfish and river mussels were also recovered from the river systems but only as dietary adjuncts. Among the terrestrial animals deer and elk were the preferred exploitable species. Few ethnographers fail to report, with ethnocentric disdain, the Takelma's liking for insect larvae and grasshoppers.

One of the apparent distinctions between the Upper and Lower Takelma was the Upper Takelma's greater reliance on terrestrial resources. Fewer good fishing localities in the latter's territory necessitated this adaptation. The Upper Takelma are characterized as shorter in stature than their downriver counterparts and technologically less advanced. They were also supposedly quite warlike, preying on the Lower Takelma for slaves. Slaves were supposedly sold to the Klamath and Shasta groups.

History

Introduction

The history of Oregon, just like the history of the Pacific Northwest, is one of people laying claims to the land, minerals, and other natural resources. Within Oregon's political boundaries lie numerous major river basin systems. Each basin possesses unique characteristics which distinguish it from others, including contiguous basins. These distinguishing features come in the form of different topographical characteristics, varieties of flora, fauna, and other environmental characteristics such as soils, hydrology, etc. Although it can be argued that basins possess more commonalities than uniqueness in terms of their ecological components, one also must consider a more subtle portion of their composition which comes in terms of their human occupation and the history of their development.

Northwestern history often discloses that motivations for Euro-american settlement in Oregon were quite dependent upon the environmental suitability of a particular river basin and the economic security it represented. Some basins possessed soil more advantageous for agricultural endeavors than others; some possessed more navigable waterways that created expedient trade routes; some were more desirable in terms of their forest or mineral resources; and many were not immediately desirable because of their relative isolation. More often than not a combination of factors were operant to structure settlement motives (cf. Hogg & Honey, 1976). The case here in point is the Rogue River Basin, Oregon, which was characterized by relative isolation and non-navigable waterways making any subsequent trade very difficult; but which contained land suitable for agriculture on a smaller scale than that of the Willamette or even the contiguous Umpqua basin.

The Rogue's most attractive feature was the mineral resource which it harbored--gold. Its presence contributed to a very rapid settlement of the valley and to the development of an historically important community of Jacksonville. Jacksonville's population and economic importance was to decline at nearly the same rate at which it grew and a mineral based economy was soon to give way to an agrarian lifestyle. Nevertheless, the community of Jacksonville did play a significant role in the history of the Rogue River Basin as well as a large portion of Southern Oregon. Herein is contained a discussion of Jacksonville's significance in Rogue River Valley history. The two must be discussed in the same context in order to provide a larger context for assessing Jacksonville's significance.

Period of Discovery

The first Europeans to sight portions of the Pacific Northwest were the Spanish in the mid 16th century. In the same century the English also sailed off the Northwest's coastal shores. Both nations reappeared periodically in the next few centuries, and were subsequently joined by the Russians in the 18th century. By the late 1770's, English, French, Russians and Americans began laying claim to the Northwest, while the Spanish chiefly confined their interests south of the 42nd parallel.

The various European and American interests exploring the Northwest possess one commonality--the search, discovery, and control of natural resources that would serve as an efficient basis for exploitation and establishment of claim to vast portions of yet unchartered territory. In addition to the unclaimed land, in the Northwest, the most immediately noticeable resource was the sea-otter and other fur bearing animals, which were in great demand in other portions of the world. Eventually the pursuit of these animals led inland where other resources were discovered and exploited. Thus the hinterland traders, trappers, and explorers eventually contributed to the settlement of this entire new country.

Period of Fur Trade

The first known trading and trapping expeditions to enter Oregon Territory were those of the Pacific Fur Company in 1811-13 and the Northwest Company in the year 1818. The Northwest Company continued their expeditions for five years. After their reorganization with the Hudson's Bay Company in 1823, the trade continued until resources were virtually exhausted. The impact of the early trappers and traders upon this new land should not be underestimated. Many regions such as the Rogue Valley attracted these individuals who subsequently mapped and chartered vast drainages and opened the way for the later and more permanent settlers. Once the Columbia region was opened, a natural corridor was available to the Willamette, Umpqua and, later, the Rogue Valley. Areas such as the Rogue were not as accurately documented as the Willamette. It can be assumed, however, that individuals involved in the historical connections of both areas contributed to the cartographical knowledge to be of later use.

The first significant Euro-American activities in the confines of the Rogue River Basin were those connected with Hudson's Bay Company. In 1826 and 1827 Alexander McLeod penetrated into the Umpqua from the Willamette corridor and on into the Rogue on a journey which ended in the Sacramento Valley. He was leading what is now termed the "Umpqua Brigade", a portion of Peter Skene Ogden's main expeditionary force camped at Fort Vancouver (Cline 1974:83).

The furrier activities in the Rogue were not as great as they were in other portions of western river drainages. McLeod reported that while the beaver was rather abundant, trappers' and soldiers' rapport with the aboriginals was not favorable. Their exploration continued, however, and they mapped and explored along the Rogue and Applegate Rivers and on into the Klamath Drainage. McLeod's accounts concerning early furrier activities in the Rogue are hard to verify and this is attributed to lost correspondence between McLeod and Hudson's Bay Company (cf. Nunis 1968).

In March of 1827, Peter Skene Ogden crossed over the Siskiyou Mountains from the Klamath Basin and penetrated deep into the Rogue's hinterland. Ogden spent some time trapping for furs before continuing north to Fort Vancouver (Beckham 1971:27). In later years many other individusals became involved and contributed to the "opening of the Rogue Country" (Beckham 1972). The importance was therefore substantial to creating new interest in the Rogue Basin.

Period of Reprisal

Circumstances that would culminate in the Rogue River Indian Wars began as early as 1828 when the Jedediah Smith Expedition clashed with coastal Indian groups. This incident is the first recorded and documented conflict between Indians and whites in southern Oregon (Colvig 1902:230). As more and more settlers began to infiltrate the Rogue in search of furs, land for colonization, and routes of travel opposition from aboriginal groups became more apparent and critical. By 1846, penetration of whites into the Rogue Basin became synonymous with confrontations with aboriginals. In 1850, Joseph Lane, the territorial governor of Oregon, was encouraged to take action against the Indians of that region (Beckham 1971:43).

In 1851, miners and settlers gained more and more control over the basin and the aboriginals began to actuate to retrive their control (cf. Beckham 1971). To effectively resist white encroachment into their lands, aboriginal groups were forced to consolidate. From 1851-1853 conflict grew immensely and many individuals came into historical prominence from their direct or indirect involvements in the region's wars. Although treaties were initiated from time to time throughout the period of 1851 to 1855, these were not successful. The year 1856 found the consolidated Rogue groups either heavily dispersed or annihilated to such small numbers they could no longer effectively resist the whites. Most were taken to the Siletz Reservation and on May 29th of 1856 the last remaining Rogues surrendered their lands.

Period of Settlement: The Rogue Basin

As Joel Palmer passed from the Umpqua into the Rogue Valley in 1846 he noted that, while it was similar to the Umpqua in its beauty, it was smaller in size and much more difficult to pass due to larger mountains (Palmer 1847:191-192). In the late 1840's when the choicest lands of the Willamette had already been claimed, areas such as the Umpqua and Rogue began to receive the overflow of those looking for permanent settlement. Reasons for settling the northwest varied somewhat; however, chief among motivations were the development of land for agriculture and animal husbandry--such was the case in the Willamette Valley. As the aforementioned spillover began to occur, settlers moved south. Some moved into California and others chose sites in the Rogue Valley. Movement proved difficult until the 1850's when Scott and Applegate initiated the "South Road" (cf. Burcham 1940).

Settlement and progress was delayed in the Rogue because of its relative isolation. Later, however, its attractivess came from an extremely different source, a resource in gold. As early as 1848, miners began moving into California in the quest for gold; by 1850 it was gold that brought people into Southern Oregon and as a result towns were established. One such place was Jacksonville--the first permanent settlement in what is now Jackson County.

Period of Growth: Jacksonville

What stimulated the growth of Jacksonville was not its agricultural potential or its timber, it was its mineral wealth. Gold was first discovered in southern Oregon in 1849 at Table Rock. Mining activities took up some two years later (Scott 1917:150). The discovery and the mining of gold brought vigorous life to boom areas such as Jacksonville, and this, in conjunction with the South Road facilitated settlement in the Rogue Valley (cf. Winther 1950).

In December of 1851, James Cluggage and John R. Pool located the first mining claim in Jacksonville. These initial diggings took the form of placer or streambed mining. By 1852, a few hundred settlers migrated into the Rogue and Jacksonville areas. While the primary emphasis was originally on gold mining, agriculture and animal husbandry were engaged in, but to a lesser extent (Tucker 1932:313). In 1852 Henry Kipple and J. R. Pool began laying out the physical townsite of Jacksonville. In February of that year the town's first general store appeared along with a sort of organized law and order. A sawmill also appeared near Ashland Creek. Population of the growing Jacksonville was estimated at over 1,000 persons. From 1853- 1854 schools, churches, and mail service began for Jacksonville. At this same time Peter Britt opened his first studio (Haines 1967). By 1855 Jacksonville had the distinction of having its own newspaper, The Table Rock Sentinel, and a jail. During 1853 gold was discovered in other portions of the Rogue Basin: Applegate Creek, Coquille, and the upper Rogue tributaries (cf. Scott 1917). From 1851-1900 the area surrounding Jacksonville yielded some $35,000,000 in gold (Colvig 1902:230).

Gold was not a localized phenomena; in fact, its generalized distribution throughout the Northwest and other portions of the country provided an added stimulus for settlement and for the development of mercantiling and transportation. Although gold played an important part in the growth of Jacksonville and other portions of southern Oregon, by 1860 farmers and ranchers were becoming more commonplace and were playing a more important role in the economy. Steadily the miners were coming to be replaced as rapidly as they had their beginning. Some remain even today, in search of other minerals like silver.

Initially, Jacksonville was dependent upon a "home economy." Miners and farmer-ranchers developed a reciprocity in trading; each was highly dependent upon the others' wares. As late as 1862 the system was still in effect. A large part was due, of course, to the Rogue isolation. The Willamette Valley had by now developed much more sophisticated transportation and trade networks. It was a definite economic advantage for settlement (cf. Mullen 1902). In the heighth of the gold rush, Jacksonville and other portions of southern Oregon were largely dependent upon overland supplies via California and Crescent City. Wagon freighting was greatest in the Rogue Valley since its waterways were not navigable and since the railroad had not yet made its appearance in many parts of the Pacific Northwest. Eventually overland trade was initiated from the Willamette Valley. In spite of the great distance and difficult terrain, the Rogue proved to be an eager market (Winther 1950:138).

The earlier transportational devices were pack trains in the 1850's, and eventually, wagons in the 1860's. Jacksonville maintained its importance for a number of years as a nucleus for trade and settlement. Stage lines appeared in 1861 which linked Jacksonville to California and the Willamette Valley (cf. Winther 1950).

City improvements began for Jacksonville in the 1860's. Grading graveling of streets and sidewalks marked the first real efforts at community improvements, in addition to a host of new buildings and enterprises (cf. Haines 1967). The U.S. Postal Service now offered mail on a regular basis via Wells Fargo and Company.

During the 1870's agriculturalists in the Rogue began producing items for export since the depletion of miners were no longer creating heavy demand locally for their wares. Jacksonville was beginning to lose its importance, its population was declining, and the coming of the railroad was to signify its commercial demise.

Final Period: Attempts at Revitalization

The railroad had much to do with reshaping the economic and social order of many communities. Jacksonville, as well as other parts of the Rogue Basin, had for the most part felt the deprivation associated with

geographical isolation. At the time the Oregon and California Railroad reached the Rogue Valley it was experiencing financial hardships. This in combination with the decreasing economic and social importance of Jacksonville, and its being removed from the main rail line, led to the decision to bypass Jacksonville. The decision raised protest from the residents of the community but to no avail (Haines 1959:144-145). Thus the railroad, in conjunction with the depletion of ore reserves, was soon to reduce Jacksonville not only in size but also significance. By 1890 Jacksonville's growth had ceased and the railroad had served to accentuate the decline (Farnum 1956:43).

Jacksonville's one last attempt to reshape its economic order and importance came in 1890 through efforts to establish its own railroad to connect with the main line to the east; however, it never realized any significant success. Subsequently, the town began losing its business among the now well-developed agrarian economy. A newly formed community called Medford was now realizing the importance and prestige that was once Jacksonville's.

From the 1890's Jacksonville supported a very important agricultural market, in conjunction with that of the remainder of Jackson County. It continued to grow, but prosperity of the gold mining days was never again realized. In 1912 more local industry was attracted which made a new type of axle for automobiles (cf. Haines 1967). Its population by 1920 was some 489 persons. Jacksonville, today, is once again marked for population growth, but the attraction is of a different nature.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OREGON OPERATIONS OFFICE
1234 S.W. MORRISON STREET
PORTLAND, OREGON 97205

REPLY TO ATTN OF: 10000

OCT 8 1976

Mr. Edward Long
State Historic Preservation
Oregon State Highway Division
Highway Building
Salem, Oregon 97310

Re: City of Jacksonville
C-410498

Dear Mr. Long:

As part of the EPA's preparation of the draft environmental impact statement for the City of Jacksonville, an archaeological survey of the various project alternatives was conducted. The survey was conducted by Mr. David Brauner, Oregon State University. The following are results of the survey:

Alternative A - no impact
Alternative B - three options of which two require additional surveys.
Alternative C - additional surveys needed on spray irrigation site.
Alterntiave C-2 - no impact but additional surveys needed on spray irrigation site.

As you may note, the surveys are incomplete. However, with your concurrence, the EPA will insure that a complete survey is conducted once an alternative has been selected. The survey will be completed prior to the initiation of design.

If you have any specific questions, please call me at 221-3250.

Sincerely yours,

William J. Sobolewski

William J. Sobolewski
Project Officer

cc: City of Jacksonville
T. Flatebo
Jones & Stokes Associate, Inc.
DEQ

APPENDIX F

Population Projections and Definition of an Urban Growth Boundary for the City of Jacksonville

CITY OF JACKSONVILLE
P. O. BOX 7
JACKSONVILLE OREGON 97530

July 20, 1976

T. Flatebo and Associates
PO Box 849
Jacksonville, OR 97530

Dear Mr. Flatebo:

Here is the outline of work that I have done with the county on the urban growth boundary (UGB) for the City of Jacksonville.

I The urban growth boundary concept

1) It is a boundary area outside the present city limits allowing for urban development (less than 1 acre/dwelling unit) to the year 2000.

2) Vacant land within the city should be encouraged to be developed before expanding outward. Thus it would be phased expansion or growth.

3) The city does not have to annex the land within the UGB.

4) The line must be within the constraints outlined in LCDC Goal 14, Urbanization:
   (a) retention of USDA/SCS Class I-IV soils in agriculture
   (b) provision of support services, in particular sewer and water
   (c) a genuine need to accommodate the proposed population growth
   (d) county coordination and agreement with the boundary area

5) Ultimately, the line will be precisely set along legal property lines. The county will appropriately zone the areas inside and out the UGB area to guide urbanization to the designated areas.

II The work I have done to date along with Robin Lilley, the county planner assigned to the job.

1) From county sources we mapped the areas outside the city limits as to:
   (a) soil type, SCS land capability classifications
   (b) slope
   (c) present county zoning
   (d) present land uses
   (e) county comprehensive plan designations

2) I made three population projections (low 5%, medium 7%, and high 9%) based on various assumptions as to growth policy, regional economic conditions, desirability of living in Jacksonville, and provision of public services. The assumptions and projections are enclosed.

3) On April 14 Robin and I held introductory meeting jointly open to both the Jacksonville Planning Commission and City Council to explain the UGB concept and present the background maps.

4) Two work sessions were held with two members of the Planning Commission, one member of the Council, the the City Administrator to work on the placement of a tentative UGB line.

5) A conceptual UGB line was presented to the Planning Commission on May 6. This was approved by the Commission. A map showing the UGB is included.

6) On July 19 I presented the UGB work to our Citizens Advisory Committee on Planning.

III There is still musch work to done to finalize the boundary along property lines

1) I need to do a buildable land survey within the city limits to get a more accurate idea on how much growth and at what densities the city can accommodate. This will be completed by the end of December of this year.

2) Population projections will also be completed by that time.

3) The city through the comprehensive planning process, including citizen participation,

CITY OF JACKSONVILLE
P. O. BOX 7
JACKSONVILLE, OREGON 97530

needs to develop growth policies to hook up with the UGB process.

4) Generally, the sequence of events with county coordination for the UGB is presented in a county outline entitled "Countywide Urbanization Plan". We are presently starting Phase II. The outline is enclosed.

5) The whole process should take 1½ years to complete.

I hope this information will be of help to you. Unfortunately our time frameworks do not really match up, but I hope that it will at least be consistent.

Sincerely,

Terry Jones
Planning Assistant

encl.
cc: John Ives, Jones and Stokes

Jacksonville Urban Growth Boundary and Population Assumptions

Methodology:

Project various rates of growth (straight line) to the year 2000
- 5% low (close to historical growth rate)
- 7% medium
- 9% high

List assumptions for each rate
1) growth policy
2) regional economic conditions
3) desirability or demand for living in Jacksonville
4) public service availability
   a. schools
   b. water
   c. sewer

Points to keep in mind
- the relationship between different densities and land consumption
- the relationship between density and demand
- the relationship between growth and the character of the area (the consumption of open space land)

LCDC constraints
- retention of Class I-IV agricultural land
- maximum efficiency of land uses within and on the fringe of urban area

Low Projection

Continuation of population trend from 1960-75

Assumptions:

1) Growth Policy

General continuation of present density of development (low) and maintainence of unofficial open space (vacant lots and largelots).

2) Regional Economic Conditions

Continuation of regional ecomic conditions. Assumes that timber industry will continue to be dominant in the economy with attendant yearly and seasonal fluctuations in employment (based on demand).

3) Desirability

Jacksonville to remain or increase as an exclusive area to live in: large lot sizes, higher incomes, older residents, less children

4) Public Services

a. Schools

probably small increase in enrollment, present school capacity may be adequate.

b. Water

present system will have to be expanded to some degree, higher value of homes would probably pay for it if cost is relatively low.

c. Sewer

Sewer capacity will have to be expanded, if system is too high, higher density development might result in order to be able to pay for it

Medium Projection

Continuation of trend from 1968-75

-assumptions:

1) Growth Policy

encouragement of additional development at relativley higher density than present. Some unofficial open space lost from the efficiency of development.

2) Economic

Some improvement on economic conditions. Timber industry either less dominant in economy or diversified to such a degree that employment stability is definetly increased, unemployment is reduced.

3) Desirability

The City is assumed to be desirable to a wider range of people. New residents young to old, some children.

4) Public Services

a. Schools

slightly higher demand than present. Projected needs should be examined as to financing capability and 549C school policy.

b. Water

Expand present system, examine financing capability, etc.

c. Sewer

Expand present system, examine finacing capability, etc.

High Projection

-continuation of trend from 1968-72 (during sewer hook up availability)

-assumptions:

1) Growth Policy

Active encouragement of new development at higher density than present. Significant in-town open space lost due to infilling.

2) Economic

Significant improvement. Primary industry (timber or other) has stable employment. Unemployment significantly reduced from present.

3) Desirability

Assumed to be desirable to wide range. New residents of all types, greatest increase in young with children.

4) Public Services

a. Schools

Much higher demand than present, consider financial capabilities.

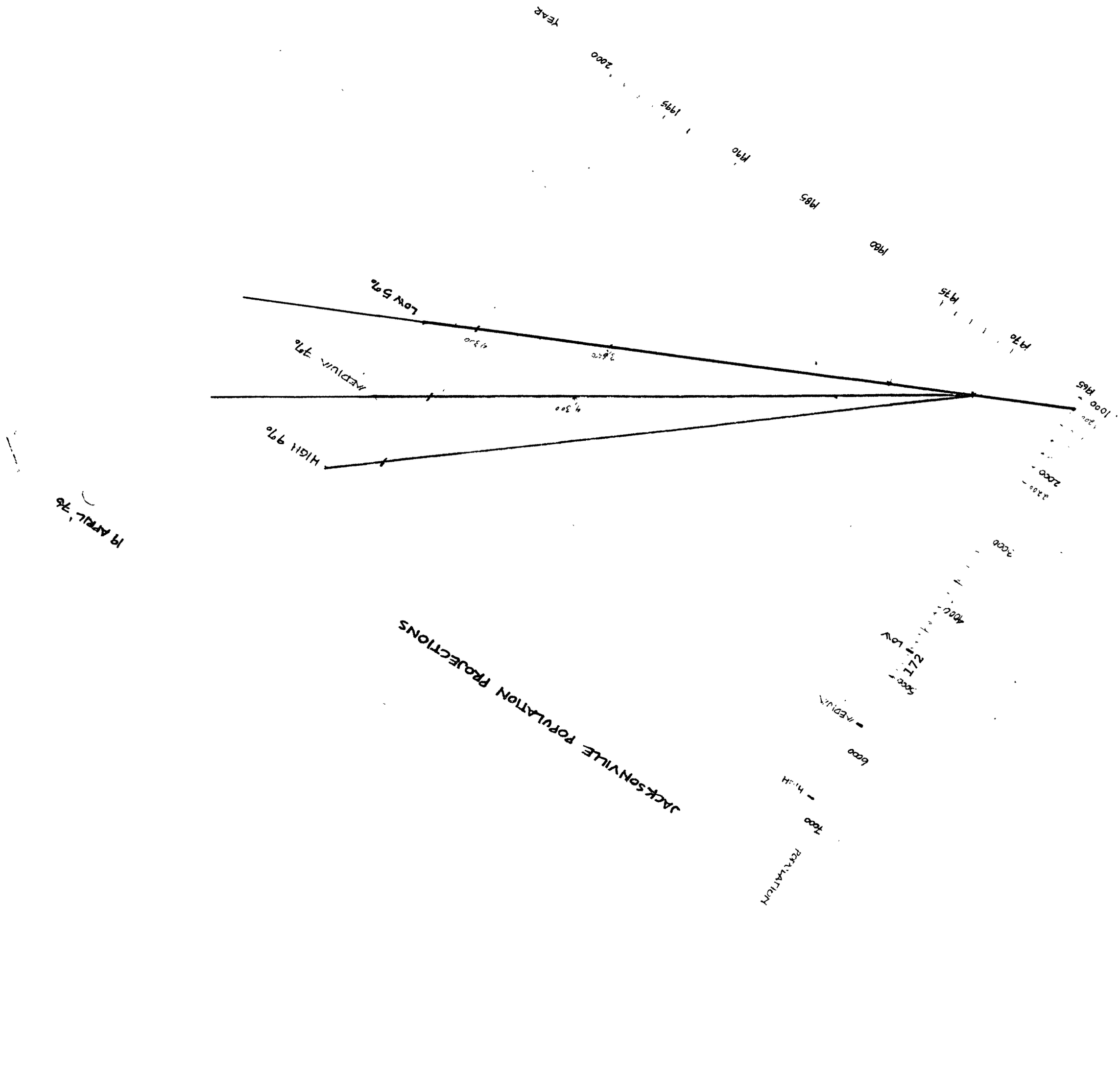
b. Water

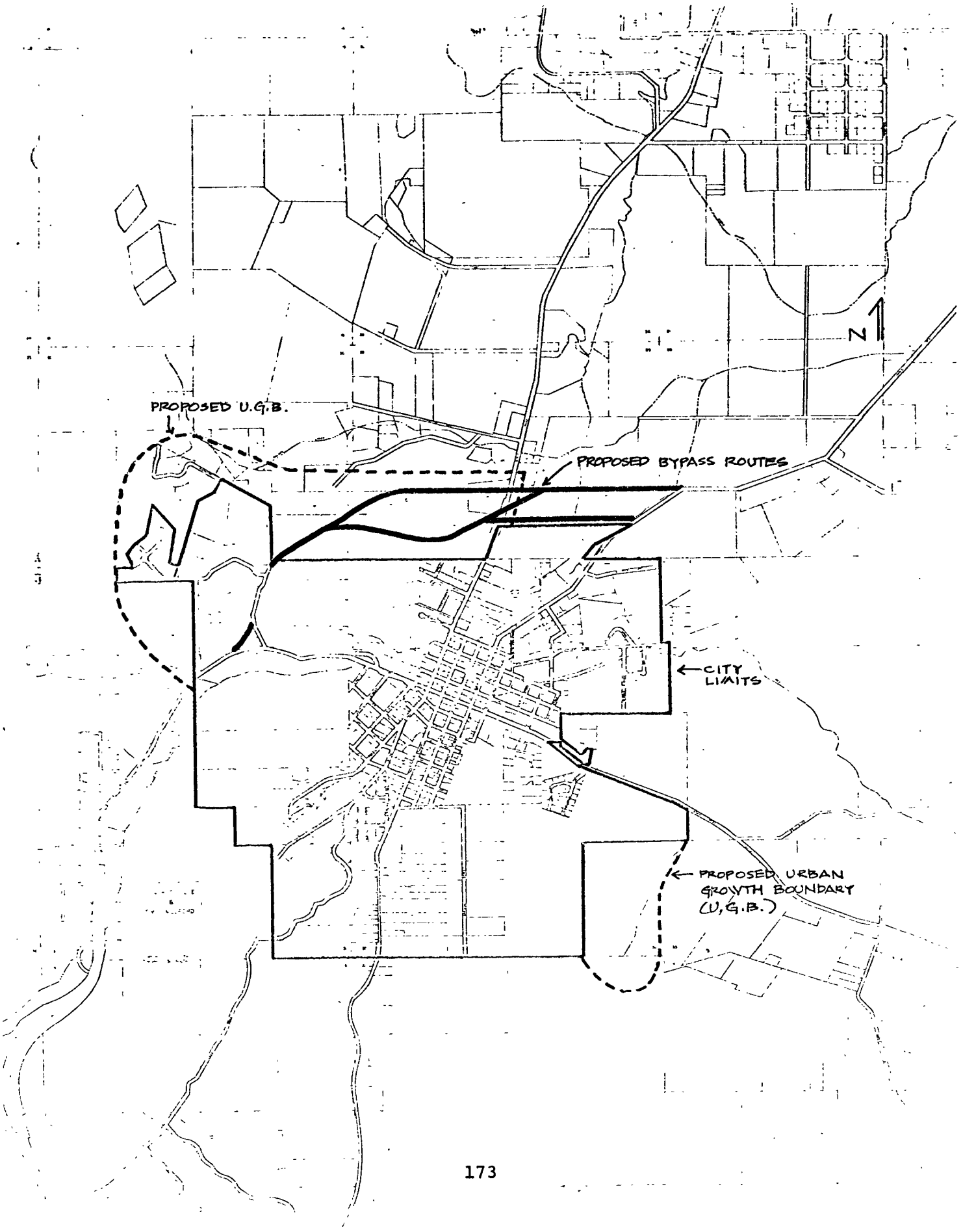
Much higher demand than present, etc.

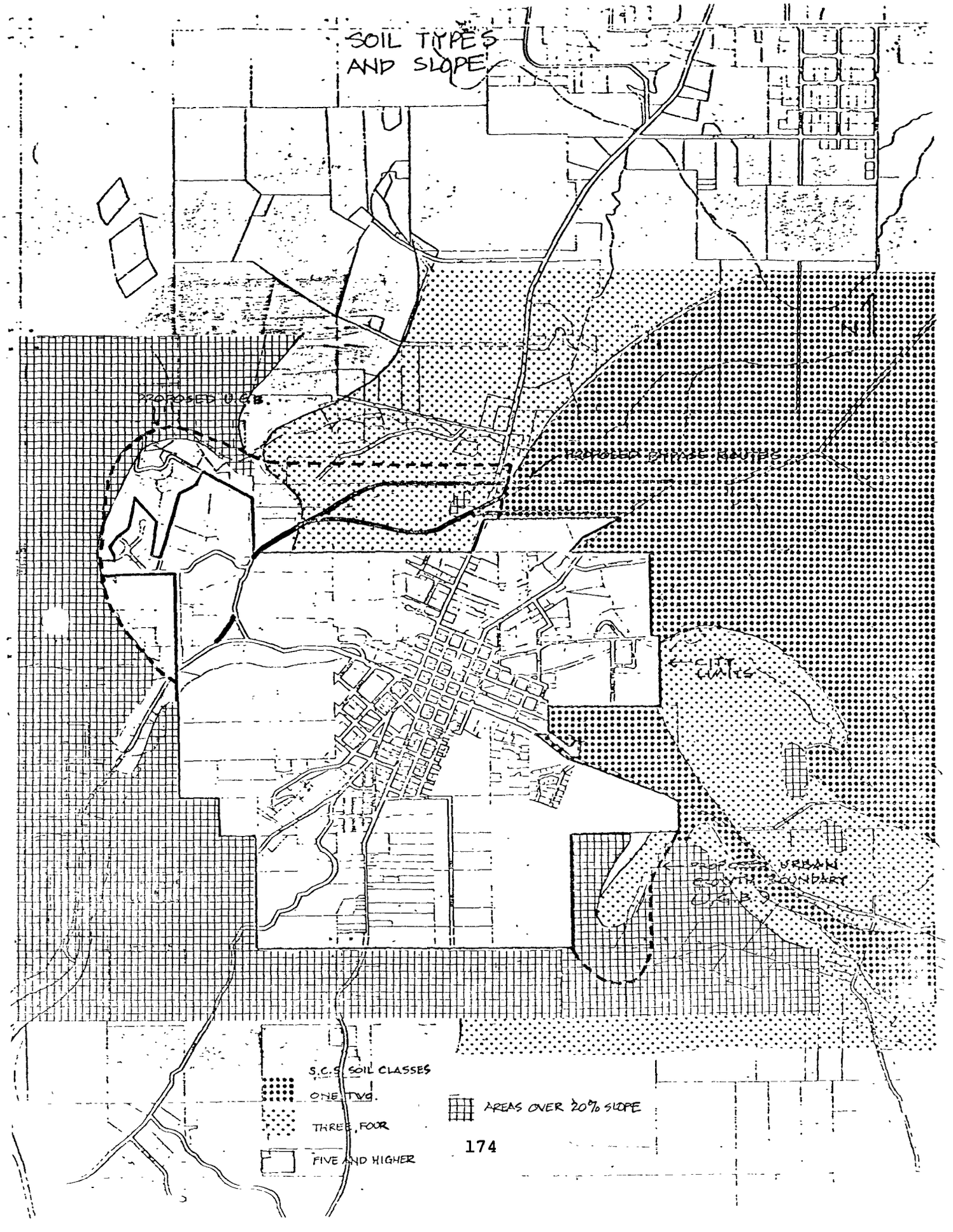
c. Sewer

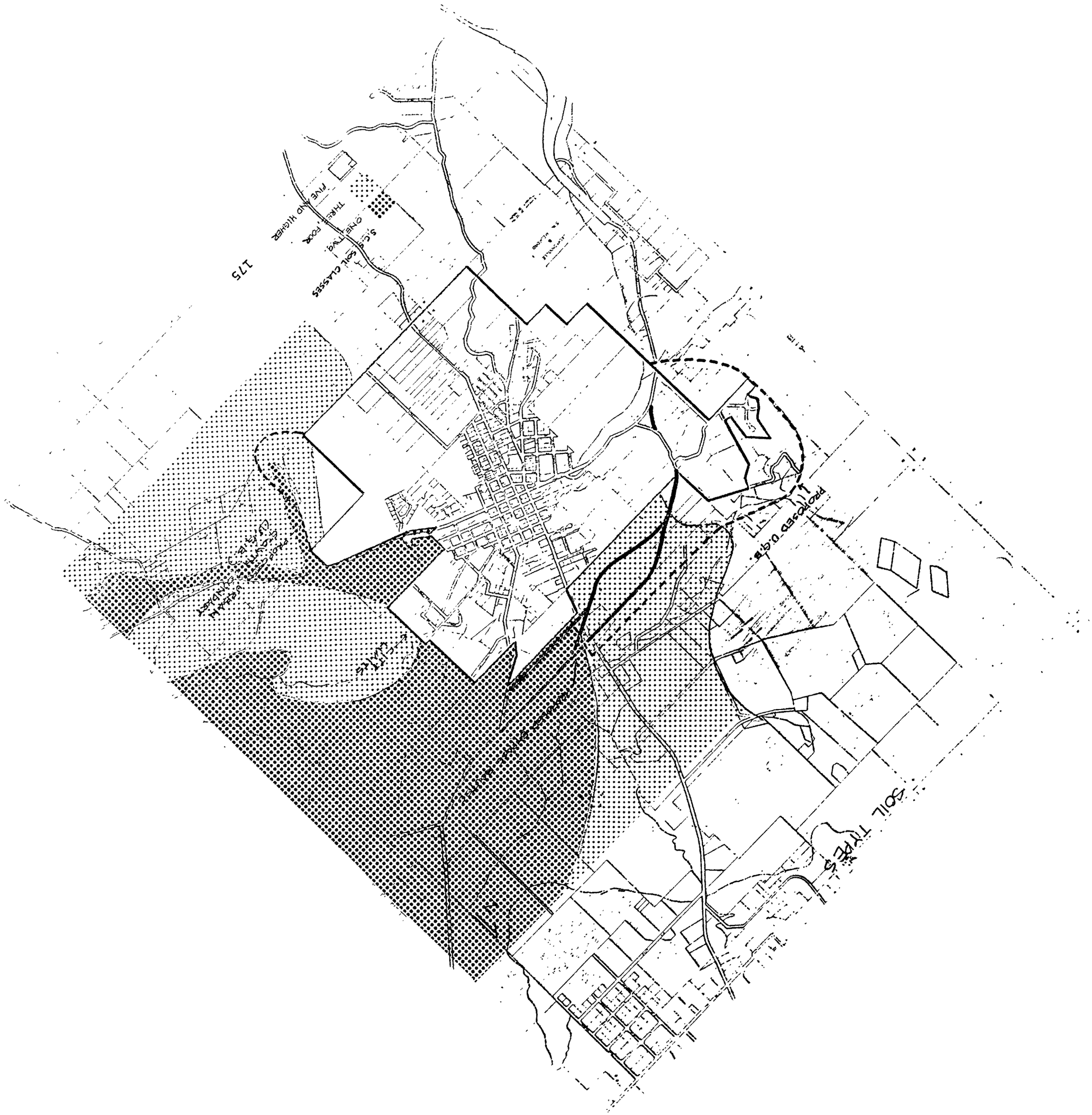
Much higher demand than present, etc.

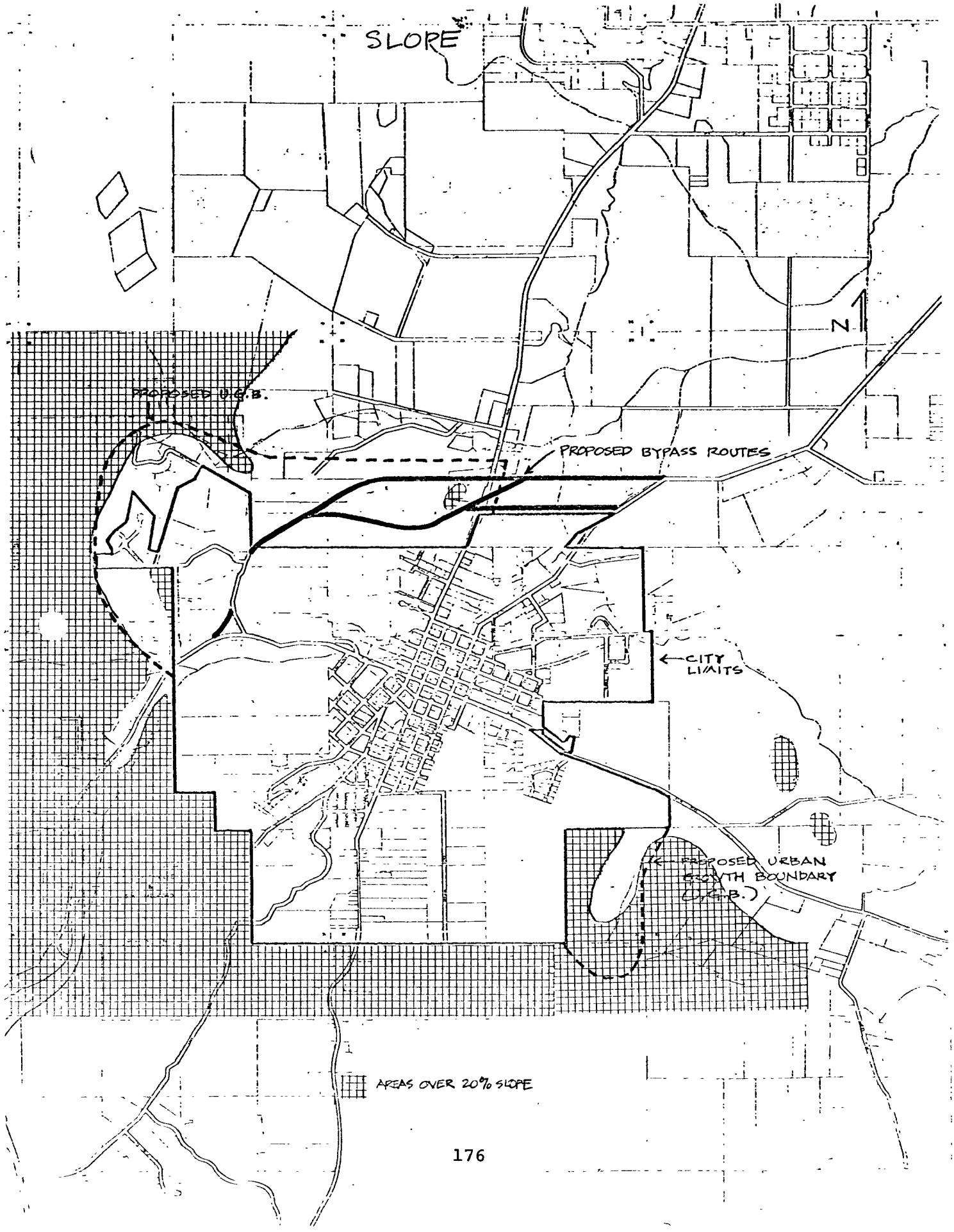
JACKSONVILLE POPULATION PROJECTIONS




PROPOSED U.G.B.
PROPOSED BYPASS ROUTES
N
CITY LIMITS
PROPOSED URBAN GROWTH BOUNDARY (U.G.B.)


SOIL TYPES
AND SLOPE
PROPOSED U.G.B.
CITY LIMITS
S.C.S. SOIL CLASSES
ONE, TWO.
THREE, FOUR
FIVE AND HIGHER
AREAS OVER 20% SLOPE


175
SOIL CLASSES
ONE TWO
THREE FOUR
FIVE AND HIGHER
PROPOSED U.S. 1
SOIL TYPES


SLOPE
N
PROPOSED U.G.B.
PROPOSED BYPASS ROUTES
CITY LIMITS
PROPOSED URBAN GROWTH BOUNDARY (U.G.B.)
AREAS OVER 20% SLOPE

APPENDIX G

Wastewater Analysis by U. S. Forest Service

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Rogue River National Forest
P. O. Box 520, Medford, Oregon 97501

2470

October 4, 1976

T. Flatebo and Associates
935 North Fifth Street
P.O. Box 849
Jacksonville, Oregon 97530

Dear Mr. Flatebo:

This summer you discussed with us the possibility of using the outflow treated sewage effluent for irrigation water at the proposed Forest Service Tree Nursery in Sections 15 and 16, T.36S., R.2W., W.M. You asked for a decision as to whether we would be able to use this water, if the City of Jacksonville piped it to the property for our use on an as-needed basis.

Our research into the matter is completed, and the decision has been made that this treated water would be acceptable for nursery irrigation, but with several limitations, as follows:

1. The boron content at the present treatment plant was measured at 0.60 mg/liter. We feel this is tolerable, but approaching a concentration that could be a future problem. Should boron, or any other chemical become unmanageable in the future, we would have to reserve the right to cancel the agreement on one year's notice.

2. The period of water use at the nursery will be about April 1, through September 15 most years. We cannot use the water during the fall and winter months. Thus, the City of Jacksonville should plan sufficient reservoir storage to hold the fall and winter supply until such time that it could be used at the nursery site.

3. The treated discharge from the treatment reservoirs must be biologically inert when it enters the pipeline, in order that there be no possibility of transmitting diseases to Forest workers at the nursery.

4. Although we know of no reason at this time, if something unforeseen should cause the nursery not to be built, we could not use the water.

The above criteria have all been discussed with you previously, but it seems proper to list them again as a part of this letter. Since they have all been considered in your design criteria, none should present any great obstacle to your proposal.

Therefore, in summary, the alternative that treated effluent be piped by the City of Jacksonville to the proposed Forest Nursery site for irrigation is acceptable to the Rogue River National Forest. The project would be mutually beneficial to both the Forest Service and the City.

We look forward to working with you on this project, if it is accepted by the City.

Donald H. Smith

DONALD H. SMITH
Forest Supervisor

UMPQUA RESEARCH COMPANY

Water and Air Technology

P. O. Box 791 ◆ Telephone (503) 863-5732

626 N.E. Division Street Myrtle Creek, Oregon 97457

Gerald V. Colomb

David F. Putnam

TEST RESULTS

NAME Rogue River National Forest ATTN John Brazier DATE 8-16-76

ADDRESS 333 W. 8th St., Medford, OR 97501 DATE REPORTED 9-16-76

TEST	SOURCE	Phoenix Canal & Old Military Road		Jacksonville Sewage Treatment Plant	
	DATE TESTED	Site 4		Site 5	
	SAMPLE # / UNITS	60826-4		-5	
pH	pH Units	7.7		7.4	
SPECIFIC CONDUCTIVITY	μ mho/cm	183		340	
ALUMINUM, Extractable	mg/liter	0.7		0.3	
ARSENIC, Extractable	mg/liter	<0.01		<0.01	
BORON * Total	mg/liter	0.33		0.60	
CALCIUM, Extractable	mg/liter	19.85		18.61	
IRON, Extractable	mg/liter	0.67		0.26	
MAGNESIUM, Extractable	mg/liter	10.13		8.64	
MANGANESE, Extractable	mg/liter	0.11		0.13	
TOTAL KJELDAHL NITROGEN	mg/liter	0.4		11.5	
FILTERABLE RESIDUE	mg/liter	24		59	
SELENIUM, Extractable	mg/liter	<0.002		<0.002	
COPPER, Extractable	mg/liter			0.01	
ZINC, Extractable	mg/liter			0.07	
ORTHO PHOSPHOROUS	mg/liter			6.7	
SODIUM, Extractable	mg/liter			44.0	

*Unable to run Boron on extractable metals sample

APPROVED BY David F. Putnam

APPENDIX H

Compilation of Air Emissions Based on Population and an Index of Annual Average Daily Travel

POPULATION PROJECTIONS

Year	City of Jacksonville[1]	Rural Portion of Project Study Area[2]	Total Study Area -- Low Projection[3]	Total Study Area -- High Projection[4]
1975	2,070	500	2,570	2,570
1980	2,807	625	3,432	6,011
1985	3,541	750	4,291	9,452
1990	4,276	875	5,151	12,894
1995	5,010	1,000	6,010	16,335
1997	5,304	1,050	6,354	17,711
2000	5,745	1,125	6,870	19,776

NOTES:

[1] Mid-range projection (7.09 percent annual growth rate).

[2] Based on holding capacity set by current zoning, 5.0 percent annual growth rate.

[3] Total of first two columns.

[4] Based on capacity of interceptor connecting the study area to the regional treatment plant; assumes utilization of full capacity by 1997 and necessary changes in study area zoning.

INDEX OF ANNUAL AVERAGE DAILY TRAVEL
(trips per day)

Year	Index of Local Travel[1] Population Projection Basis			Local of Tourist Travel[2] Population Projection Basis			Index of Total Travel Population Projection Basis		
	City Mid-Range	Study Area Low	Study Area High	City Mid-Range	Study Area Low	Study Area High	City Mid-Range	Study Area Low	Study Area High
1975	4.400	5,463	5,463	600	745	745	5,000	6,208	6,208
1980	5,967	7,295	12,777	814	995	1,742	6,781	8,290	14,519
1985	7,527	9,121	20,091	1,026	1,244	2,740	8,553	10,365	22,831
1990	9,089	10,949	27,408	1,239	1,493	3,737	10,328	12,442	31,145
1995	10,649	12,775	34,722	1,452	1,742	4,735	12,101	14,517	39,457
1997	11,274	13,506	37,647	1,537	1,842	5,134	12,811	15,348	42,781
2000	12,212	14,603	42,036	1,665	1,991	5,732	13,877	16,594	47,768

NOTES: Based on population projestions shown in the previous table and on 1975 traffic count data for Highway 238 west of 5th Street in Jacksonville.

[1] Assuming constant 2.13 trips per person, based on 1975 data for Jacksonville.

[2] Assuming tourist travel remains a constant percentage of local travel (13.64 percent) based on 1975 data for Jacksonville.