TARRANT COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NUMBER ONE

TEXAS WATER DEVELOPMENT BOARD

Upper West Fork and Clear Fork Trinity River Basin Water Quality and Regional Facility Planning Study

FINAL REPORT

APPENDIX C
INDIVIDUAL COMMUNITIES OUTSIDE OF DESIGNATED FACILITY PLANNING REGIONS

August 1988

Alan Plummer and Associates, Inc.
CIVIL/ENVIRONMENTAL ENGINEERS • ARLINGTON–FORT WORTH, TEXAS

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APPENDIX C

INDIVIDUAL COMMUNITIES OUTSIDE OF DESIGNATED FACILITY PLANNING REGIONS

INTRODUCTION

This Appendix C presents the current status of facility planning activities by the 12 individual communities selected for study outside the designated facility planning regions considered in Appendix A and Appendix B. Individual communities selected for study as Facility Planning Areas (FPAs) are listed below:

1. City of Decatur
2. Community of Briaroaks
3. City of Bridgeport
4. City of Jacksboro
5. Town of Joshua
6. City of Runaway Bay
7. City of Springtown
8. City of Chico
9. Community of Paradise
10. Community of Poolville
11. City of Lake Bridgeport
12. City of Alvord

The proposed facility planning area boundaries for each of the 12 individual communities are shown on Figures C-1 through C-14. In addition, Figures C-1 through C-14 show existing wastewater service areas, existing and proposed wastewater treatment plants. For the four communities currently served by individual on-site wastewater disposal (septic tank) systems, the figures show the general collection system layouts and wastewater treatment plant locations.

The estimated annual cost per household to construct, operate and maintain the wastewater collection and treatment systems for various permit conditions is covered in detail in this appendix.

Population projections through design year 2005 for each of the facility planning areas are presented in Table C-1 and Table C-2. Table C-1 lists population projections through design year 2005 for each of the individual communities based on the area within current city limits, while Table C-2 includes both the area within current city limits and the "rural" area outside city limits but within the proposed FPA boundary.

This appendix summarizes the facility planning activities of those individual communities designated as management agencies in the initial 208 Plan or previous reports and recommends alternatives for local wastewater collection and wastewater treatment plant facilities for those individual communities currently served by individual on-site wastewater disposal (septic tank) systems.

FACILITY PLANNING AREAS

Decatur Facility Planning Area

General. The City of Decatur is the county seat of Wise County located 38 miles north by northwest of Fort Worth on U.S. Highway 287. Decatur lies within Segment 0810 of the West Fork of the Trinity River which is bounded by the Lake Bridgeport Dam upstream and by Eagle Mountain Lake downstream.

The City of Decatur accepted designation as the Management Agency responsible for the newly created Decatur Sewerage Planning Area (SPA), as recommended by the April 1981 "Summary Report, Wastewater Facility Needs, Trinity Basin" prepared by the Trinity River Authority of Texas. This 1981

report recommended that the City of Decatur initiate facility planning within 5 years to meet the projected wastewater treatment and sewerage collection needs of the Sewerage Planning Area to the year 2000. This report will serve as a "SPA Update" to summarize those actions taken by the City of Decatur to initiate facility planning.

Planning Area Boundaries. The Decatur Facility Planning Area (FPA) is shown on Figure C-1 and Figure C-2 and was determined by several factors including identification of potential growth areas, location of natural drainage basins, and incorporation of recommendations provided by a "Preliminary Engineering Report for Sanitary Sewage System for the City of Decatur" dated December 1987. This draft "Preliminary Engineering Report" has been presented for consideration by city staff.

Population. The 1980 census showed a population of 4,104 persons for the City of Decatur. Population estimates provided by the city staff indicate a current 1987 population of 4,500 to 4,700 persons within the city limits. Based on a current house count by the city of 1,890 houses and factor of 2.5 persons per house, an estimated 1987 population of 4,725 is reached. Table C-1 shows population projections for Facility Planning Area Town Populations based on current city limit boundaries. Table C-2 shows population projections for Small Sewerage Planning Area Populations which include both rural and town populations for each FPA boundary delineated.

The "Preliminary Engineering Report" projects a population of 5,840 persons for design year 2005 (Table C-1) while a projected population of 6,052 is shown in Table C-2 for design year 2005.

Existing Wastewater Facilities. The City of Decatur is presently served by one wastewater treatment plant with a design capacity of 500,000 gallons per day based on a design population of 5,000. The existing wastewater collection system is characterized by several lift stations required due to

the topography of the facility planning area. The existing wastewater treatment plant and lift stations are shown on Figure C-1 and Figure C-2.

The City has initiated a monitoring program to assist in reducing the current problems with inflow and infiltration. The current discharge permit for the existing wastewater treatment plant allows for the following conditions:

Flow	- Average daily	400,000 gal/day
	Maximum daily	800,000 gal/day
Quality	- BOD (30-day average)	30 mg/l, 100 lbs/day
	BOD (7-day average)	45 mg/l
	TSS (30-day average)	90 mg/l, 300 lbs/day

In 1986, the following actual conditions were observed:

Flow	- Average daily	316,500 gal/day
Quality	- BOD (30-day average)	21.31 mg/l
	TSS (30-day average)	51.63 mg/l

Technical Alternatives. The "Preliminary Engineering Report" prepared for the City of Decatur by the City's Engineer evaluates both existing conditions and future conditions for wastewater collection and wastewater treatment for the Decatur FPA for a design population of 6,300 (year 2010). The following summary of technical alternatives comes from the "draft" copy of the "Preliminary Engineering Report" and provides the City of Decatur with a Facility Plan as recommended in the April 1981 "Summary Report" previously referred to.

Design Criteria:	Design population (year 2010)	6,300
	Average flow	70 gpcpd
	Quantity of sewage	441,000 gal/day

Alternative A - Treat All Sewage at Existing Plant

Continue to operate splitter box such that the flow equivalent to a population of 3,000 persons flows through the Imhoff tank. Essentially this alternative does nothing to improve the existing collection system or performance or capacity of the existing treatment plant.

Alternative B - Upgrade Existing Plant to Treat all Wastewater Flow

Use existing Imhoff tank and construct new parallel Imhoff tank to receive flow equivalent to a population of 3,300 persons and construct new sludge drying beds. The existing sludge drying beds are too small and require manual cleaning. The "draft" report recommends constructing at least half of the proposed sludge drying beds immediately. Construction of the additional Imhoff tank and other half of the sludge drying beds could be delayed until the year 2000 or until the population served by the treatment plant reaches approximately 5,450 persons.

Alternative C - Construct New Wastewater Treatment Plant and Collection System to Serve Northwest Drainage Basin

Construct three wastewater collection lines: Lines A, B and C, a new lift station and new Northwest Wastewater Treatment Plant. See Figure C-1 for locations of these proposed improvements.

Alternative D - Construct Wastewater Collection System and Lift Station to Serve Northwest Drainage Basin

Construct three wastewater collection lines: Lines A, B and C, a new lift station and force main to collect and carry wastewater from the northwest drainage basin to the existing wastewater treatment plant. See Figures C-1 and C-2 for locations of these improvements.

Alternate E - Construct New Wastewater Treatment Plant to Serve Northeast Drainage Basin (WWTP Located at Site No. 1)

Construct four wastewater collection lines: Lines A, B, C, and D, and new Northeast Wastewater Treatment Plant on Pecan Creek at Site No. 1. See Figure C-1 for locations of these proposed improvements.

Alternate F - Construct New Wastewater Treatment Plant to Serve Northeast Drainage Basin (WWTP) Located at Site No. 2)

Construct five wastewater collection lines: Lines A, B, C, D, and E, and new Northeast Wastewater Treatment Plant on Pecan Creek at Site No. 2. See Figure C-1 for locations for these proposed improvements.

NOTE: The difference between Alternate "E" and "F" is the location of the proposed Wastewater Treatment Plant in the Northeast Drainage Basin.

Alternate G - Construct New Lift Station To Serve Northeast Drainage Basin (Lift Station Located at Site No. 1)

Construct four wastewater collection lines: Lines A, B, C, and D, a new lift station, and new force main at Site No. 1 on Pecan Creek. See Figure C-1 for locations of these proposed improvements.

Table C-3 shows a comparison of alternatives provided in "Preliminary Engineering Report."

The City has plans to proceed immediately to improve the existing treatment plant by renovating the existing headworks and constructing new sludge drying beds which can be cleaned using mechanical equipment instead of by manual cleaning.

Conclusions. The City of Decatur has accepted the designation as the management agency responsible for initiating facility planning for the Decatur Sewerage Planning Area. The City hired a consulting engineer to prepare a "Preliminary Engineering Report on the Sanitary Sewer System for the City of Decatur." This draft report dated December 1987, is currently under review by the city staff. A final engineering report will be written following comments to the Engineer by city staff. The City of Decatur is actively planning for future wastewater collection and treatment requirements as evidenced by the Preliminary Engineering Report recently submitted to the city.

Briaroaks Facility Planning Area

General. The Community of Briaroaks is located approximately 18 miles south of Fort Worth on Interstate Highway 35 West (I-35W) in Johnson County. Briaroaks lies within Segment 0828 of the Trinity River Basin. The Briaroaks community is presently served by individual on-site wastewater disposal systems and has not been formally designated as the management agency responsible for facility planning to meet the needs for wastewater collection and treatment through design year 2005.

Planning Area Boundaries. The proposed Briaroaks Facility Planning Area (FPA) shown on Figure C-3 was determined by several factors including current community limits, natural drainage basins, and identification of potential population growth areas. The FPA boundary proposed for consideration should be more closely defined at the time Briaroaks or some

other agency accepts designation as the management agency. The management agency will have the responsibility to initiate facility planning to meet the projected needs of the facility planning area to the design year 2005.

Population. The 1980 census showed Briaroaks with a population of 592 persons. The current 1987 population for the Briaroaks community is estimated at 850 persons. Table C-1 shows population projections for facility planning area towns and projects steady growth for Briaroaks with an estimated population of 1,520 persons in design year 2005. Table C-2 lists projected populations for small facility planning areas including both the rural and town populations for each town listed.

Existing Wastewater Facilities. The Community of Briaroaks has been developed primarily for single-family residences on large lots. All existing homes within the community are currently served by individual on-site wastewater disposal systems. A possible layout of a wastewater collection and treatment system to serve the area within the current community limits is shown on Figure C-3.

Soil Suitability for Septic Systems. The U.S. Soil Conservation Service Soil Survey for Johnson County, Texas, indicates that relative to suitability for use as an absorbtion field for on-site wastewater disposal systems the soils within the Briaroaks community limits are distributed according to the following estimated percentages:

Slight limitations	25 percent
Moderate limitations	10 percent
Severe limitations (slow percolation)	50 percent
Severe limiations (depth to rock or flooding)	15 percent

Proposed Wastewater Facilities. Figure C-3 shows one possible layout for a proposed wastewater collection and treatment system to serve the populated portions of the Briaroaks community. The proposed treatment facility design capacity of 0.152 MGD is based on the projected design year (2005) population of 1,520 persons shown in Table C-1 and an average daily flow of 100 gal/day/person.

Table C-4 is a summary of the estimated costs for a proposed wastewater collection and treatment system to serve Briaroaks:

Conclusions. The Community of Briaroaks is currently served by individual wastewater on-site disposal systems and has a population density sufficient to warrant wastewater collection and treatment facilities. It is recommended that Briaroaks or some other agency be designated as the management agency. A possible solution is to have Briaroaks approach the Johnson County Fresh Water Supply District No. 1 (JCFWSD No. 1), for the purpose of being served by future wastewater collection and treatment facilities. The JCFWSD No. 1 is currently involved in a Planning Phase Report to identify possible service areas within Johnson County to be served with wastewater collection and treatment facilities operated by the District. It is recommended that the Community of Briaroaks coordinate with JWFWSD No. 1 to insure that consideration is given to the future wastewater collection and treatment needs of the Briaroaks FPA.

Bridgeport Facility Planning Area

General. The City of Bridgeport is in Wise County approximately 40 miles northwest of Fort Worth at the intersection of U.S. Highway 380 and State Highway 114. Bridgeport lies within Stream Segment 0810 which is bounded by the Lake Bridgeport Dam upstream and by Eagle Mountain Lake downstream.

The City of Bridgeport was identified and officially designated as the management agency for the Bridgeport Sewerage Planning Area (SPA) in the initial 208 Plan. This report will serve as a "SPA Update" to summarize facility planning related activities conducted or planned by the City of Bridgeport.

Boundaries. The Bridgeport Facility Planning Area (FPA) shown on Figure C-4 was determined by incorporating various factors including identification of potential population growth areas, location of natural drainage basins, and input provided by city personnel. The FPA boundary shown takes into account that Bridgeport was designated as a sewerage planning area in the initial 208 Plan.

Population. The 1980 census showed a population of 3,787 persons for the City of Bridgeport. Current population estimates provided by the North Central Texas Council of Governments and confirmed by city staff indicate a population of 3,850 persons within the city limits. Table C-1 shows population projections for facility planning area towns. Table C-2 shows population projections for small facility planning areas which includes both the rural and town population for each FPA boundary. The design year 2005 population projection for Bridgeport from Table C-1 is 4,140 persons and from Table C-2 is 4,597 persons. The City of Bridgeport expects moderate population growth through design year 2005.

Existing Wastewater Facilities. The City of Bridgeport wastewater collection system consists of pipelines ranging in size from 6 inches to 15 inches in diameter. The existing wastewater treatment plant consists of a primary clarifier, anaerobic digester and sludge drying beds. The current discharge permit for the sewerage treatment plant allows for the following conditions:

Average daily flow	390,000 gal/day
BOD (30-day average)	30 mg/l
TSS (30-day average)	90 mg/l

In 1986 the followng typical conditions were observed:

Average daily flow	170,900 gal/day
BOD (30-day average)	27.43 mg/l
TSS (30-day average)	58.43 mg/l

These typical conditions indicate that the existing wastewater treatment plant operates within permit allowances.

Proposed Wastewater Facilities . The City of Bridgeport as the Designated Management Agency for the Bridgeport Facility Planning Area has facility planning underway to improve and extend the existing wastewater collection system as required. In addition, the City has made the following improvements to the existing wastewater treatment plant:

1. The primary clarifier has been refurbished to improve overall efficiency.
2. The existing anaerobic digester has been converted to an aerobic process.

The City also has plans to rework and improve the efficiency of the existing sludge drying beds.

Conclusions. The City of Bridgeport is active in facility planning to identify future wastewater collection and treatment needs. In addition, the City has already made improvements to the existing wastewater collection system to reduce the amount of inflow and infiltration. The City, as the Designated Management Agency, has initiated and maintained facility planning

activities to meet the projected needs of the Bridgeport Facility Planning Area to the design year 2005.

Jacksboro Facility Planning Area

General. The City of Jacksboro is the county seat of Jack County located approximately 50 miles northwest of Fort Worth on Highway 281. Jacksboro lies within Segment 0812 of the West Fork of the Trinity River above Lake Bridgeport which consists of 808 square miles of drainage basin covering parts of Archer, Clay, Young and Jack Counties. There are no other segments feeding into Segment 0812 because it is the headwaters of the West Fork of the Trinity River.

Jacksboro is the only major city within Segment 0812 and the only city to have effluent discharge permits for its water and wastewater treatment plants. The City of Jacksboro was officially designated as the Management Agency for the Jacksboro Sewerage Planning Area (SPA) in the initial 208 Plan. This report will serve in part as a "SPA Update" to update and summarize those actions taken by the City of Jacksboro to conduct facility planning as recommended in the "Trinity River Basin Water Quality Management Plan," "Appendix II-B, Summary of Facility Plans for Sewerage Planning Areas" dated July 1978.

Boundaries. The Jacksboro Facility Planning Area (FPA) is shown on Figure C-5 and was determined by several factors including location of natural drainage basins, identification of potential growth areas, and by incorporating information provided by city personnel. In addition, the City Engineer has provided information to assist in determining the FPA boundary. The FPA boundary is defined in general terms and not restricted to the current city limits.

Population. The 1980 census showed a population of 4,000 persons for the City of Jacksboro. The current 1987 population for Jacksboro is estimated at 4,000 persons based on information from city staff. Available sources do not anticipate growth in population numbers for Jacksboro through the design year 2005.

Existing Wastewater Facilities. The 1978 "Summary of Facility Plans for Sewerage Planning Areas" recommended that the existing wastewater treatment facilities be updated because Jacksboro frequently discharged effluents not in compliance with permit requirements due to incoming flow often exceeding the existing wastewater treatment plant capacity. The 1978 Report recommended an immediate expansion program to include additional oxidation ponds, one additional Imhoff tank, additional sludge drying bed area, and chlorination of the effluent.

The current discharge permit for the Jacksboro wastewater treatment plant allows for the following conditions:

Flow -	Average daily	185,000 gal/day
	Maximum daily	333,000 gal/day
Quality -	BOD 30-day average	30 mg/l
	TSS 30-day average	90 mg/l

In 1986, the following conditions were observed:

Flow -	Average daily (May)	352,000 gal/day
	Maximum daily (May)	732,000 gal/day
Quality -	BOD 30-day average	37.57 mg/l
	TSS 30-day average	111.29 mg/l

An amended discharge permit for Jacksboro became effective in October 1987 which allows the following conditions:

Flow	- Average daily	430,000 gal/day
	Maximum daily	700,000 gal/day
Quality	- BOD 30-day average	30 mg/l
	TSS 30-day average	90 mg/l

In 1980 the City's Engineer prepared and submitted a Facility Plan for proposed wastewater treatment plant improvements. This Facility Plan was formally approved by the City of Jacksboro in 1981 and the design phase of the proposed wastewater treatment plant expansion was begun. In August 1983 the City's Engineer submitted a report entitled, "Design Summary for Wastewater Treatment Plant Expansion and Improvements," EPA Grant No. C-481509-03-0, for the City of Jacksboro. This report listed the following basic wastewater treatment plant design criteria:

1.	Design population (year 2000)	5,000 persons
2.	Design average daily flow	0.340 MGD
3.	Design maximum daily flow	0.760 MGD

The 1983 Design Summary recommended that the following wastewater treatment units be constructed:

1. Influent structure consisting of a heavy materials trap, bar screens and a Parshall flume (6-inch) to measure wastewater flow rates accurately.

2. A new Imhoff tank to function in parallel with the existing Imhoff tank which will be refurbished to improve overall efficiency.

3. Sludge drying beds to be enlarged to provide adequate surface area to accommodate the design population.

4. Replace the first two existing stabilization ponds with a new larger pond (8.1 acre). The existing third stabilization pond (1.98 acre) and fourth stabilization pond (8.62 acre) will remain for a new total stabilization pond area of 18.7 acres.

All of the above described wastewater treatment plant expansion improvements were completed in 1985 using 75/25 Federal grants for financing. The existing third stabilization pond (1.98 acre) and existing fourth stabilization pond (8.62 acre) were ordered to be upgraded under a Permit Enforcement Order due to the depth and heavy accumulation of sludge in these stabilization ponds. The City completed this work August 1, 1987, at the City's expense with no financial assistance being available.

Conclusions. The City of Jacksboro has taken positive steps to initiate and execute responsible facility planning for the Jacksboro Facility Planning Area. Recently, the City completed an extensive expansion program which enlarged the existing wastewater treatment plant facility for a design capacity of 5,000 persons. According to population projections for the Jacksboro FPA, the newly expanded wastewater treatment plant should produce effluent which satisfies discharge permit requirements.

Joshua Facility Planning Area

General. The Town of Joshua is located in Johnson County along Highway 174 approximately 23 miles south of downtown Fort Worth. Joshua lies within Segment 0828 of the Trinity River Basin. Joshua's water supply and wastewater treatment requirements are provided by Johnson County Fresh Water Supply District No. 1. For report purposes, Johnson County Fresh Water Supply District No. 1 will serve as the management agency for the Joshua

Facility Planning Area (FPA) and will be referred to as the JCFWSD No. 1." The point source discharge permit is held by JCFWSD No. 1 and not by the Town of Joshua. Therefore, JCFWSD No. 1 has performed the role as the management agency for the Joshua FPA.

Planning Areas Boundaries. The Joshua Facility Planning Area (FPA) boundary is shown on Figures C-6 and C-7 and was determined by several contributing factors including projected population growth areas, location of natural drainage basins, and information gathered from JCFWSD No. 1 personnel involved in facility planning related activities.

The Engineer for JCFWSD No. 1 has completed a Report which addresses projected populations and other demographic information for the Johnson County area. The Engineer is currently in the planning phase for future wastewater collection and treatment needs for the entire Johnson County area. Some of the objectives of the planning phase are:

1. Identify the different drainage areas in Johnson county.
2. Locate smaller wastewater treatment plants within the county until it becomes economically feasible to tie the individual communities together in regional wastewater systems.
3. The final objective or goal of the District is to operate as few wastewater treatment plants as possible to serve the county.

The boundary of the Joshua FPA may change following the completion of the planning phase by the engineer hired by JCFWSD No. 1.

Population. The 1980 census listed the Town of Joshua with a population of 1,470 persons. Table C-1 shows population projections through the design year 2005 which were furnished by the JCFWSD No. 1. Table C-2 lists projected populations for small facility planning areas which includes both rural and town populations for each area delineated.

Existing Wastewater Facilities. The existing wastewater treatment plant operated by JCFWSD No. 1 was completed in August 1983 with a design capacity of 500,000 gallons per day. The current discharge permit for JCFWSD No. 1 wastewater treatment plant allows for the following conditions:

Average daily flow	450,000 gal/day
BOD (30-day average)	20 mg/l
(TSS (30-day average)	20 mg/l

In 1986 the following typical conditions were observed:

Average daily flow	264,000 gal/day
BOD (30-day average)	3.83 mg/l
TSS (30-day average)	6.67 mg/l

Proposed Wastewater Facilities. The JCFWSD No. 1 has initiated facility planning to expand the existing wastewater treatment facility as soon as possible. If the current service area projections presented in the recently completed Planning Report are accurate, the wastewater flows into the existing plant will exceed the permitted capacity in 1990. The size of the plant expansion will be based on estimates of growth within the present service area as well as that within an expanded service area.

The JCFWSD No. 1 has considerable room for expansion at the present plant site; however, the existing facility is not easily expanded. The Planning Report recommended that a new wastewater treatment plant be built on the existing site, which will become the first phase in a plan that would allow for an ultimate facility of 10 MGD. The existing wastewater facility would not be abandoned, but would become part of the treatment process of the new facility.

The recommended treatment process for the new facility uses complete mix activated sludge with clarification and chlorination. This treatment process is a very flexible process that allows for maximum use of the existing land area and is easily expandable.

The size of the proposed new wastewater treatment facility is not known at this time, but a facility of at least 1.0 MGD capacity will be justified. The JCFWSD No. 1 will construct the largest facility that can be justified because of the considerable savings due to the economy of scale. The JCFWSD No. 1 plans to build two phases of 1.0 MGD per phase with the facilities laid out to allow for 0.50 MGD expansion increments if growth slows within the Joshua FPA.

Conclusions. The Johnson County Fresh Water Supply District No. 1 has implemented an active facility planning program for the Joshua Facility Planning Area as well as the entire Johnson County area. The extent of the JCFWSD No. 1 plans to expand the existing wastewater collection system and wastewater treatment plant will be based largely on the projected growth within the present and expanded service areas. The JCFWSD No. 1 has operated a highly efficient wastewater treatment facility in the past and has taken an aggressive lead role to plan for future wastewater collection and treatment needs through design year 2005 and beyond.

Runaway Bay Facility Planning Area

General. The City of Runaway Bay is located in Wise County along the south shore of Lake Bridgeport and is bisected by Highway 380. Runaway Bay lies within Segment 0811 of the West Fork of the Trinity River which is comprised of Lake Bridgeport and all its drainage basin of approximately 303 square miles covering parts of Wise, Jack and Parker Counties.

Runaway Bay was originally developed in the 1960s by Lake Bridgeport Properties as a privately-owned lake resort community and did not become incorporated as a city government until 1979. As a city, Runaway Bay now has the legal and statutory authority as well as the financial, managerial and institutional capabilities required by Section 208 of the Clean Water Act as amended (PL 95-217).

Facility planning for Runaway Bay was initiated by the developer's engineer with long-range wastewater collection and treatment requirements identified in an "Engineering Report for Sewerage Collection, Treatment and Disposal" dated August 1971. Many of the original recommendations made in this Engineering Report have already been implemented by Runaway Bay while other recommended actions will occur as population growth warrants.

There has been no formal designation of the City of Runaway Bay as the management agency responsible for initiating facility planning to meet the projected needs of the proposed Facility Planning Area (FPA); however, the City has been very active in this respect. This report will serve to summarize those city activities as well as present alternatives for facility planning for the Runaway Bay FPA.

Planning Area Boundaries. The Runaway Bay Facility Planning Area (FPA) is shown on Figure C-8 and was determined by current city boundaries as well as projected growth areas. Recommendations and information gathered from city personnel was also considered in addition to the 1971 "Engineering Report."

Population. The 1980 census showed a population of 504 persons for the City of Runaway Bay. Population estimates provided by city personnel and the City Engineer indicate a current 1987 population of 800 persons within the city limits. Table C-1 shows population projections for facility planning area towns while Table C-2 shows population projections for small facility planning areas which takes into account both the rural and town

populations for each FPA boundary listed. The FPA boundary for Runaway Bay corresponds to the city limits which causes the population projections shown in Tables C-1 and C-2 to be the same. The design year (2005) population projection for the Runaway Bay FPA is 1,560 persons.

Existing Wastewater Facilities. The existing wastewater treatment plant facility consists of a contact stabilization process treatment plant including an aeration chamber, an aerobic digester, a reaeration chamber, a sedimentation chamber, and a chlorine contact chamber. The existing plant was designed for the following conditions:

Population equivalent	2,000 persons
Average daily flow	200,000 gal/day
Total peak flow	400,000 gal/day

The existing wastewater collection system is characterized by a large number of lift stations along certain areas of the lake shore. Continued efforts have been made by the City to limit the number of lift stations due to the operational and maintenance cost involved. Figure C-8 shows the location of the existing wastewater treatment plant and the proposed wastewater treatment plant site under consideration by the City.

The City has taken corrective action to reduce the wastewater flow due to inflow and infiltration. The current discharge permit for the existing wastewater treatment plant allows for the following conditions:

Average daily flow	200,000 gal/day
BOD (30-day average)	10 mg/l
TSS (30-day average)	15 mg/l

According to city personnel the existing wastewater treatment plant treats an average daily flow of 100,000 gallons and a maximum daily flow of 151,000

gallons with occasional variations. There were no discharges from the treatment plant facility in 1985 or 1986 to compare with permit requirements due to the fact that all treatment plant effluent is used to sprinkle the golf course at Runaway Bay. Based on this sprinkling estimate and the current growth patterns at Runaway Bay it will be some time before the volume of effluent will exceed the volume required for watering.

Proposed Wastewater Facilities. Runaway Bay's facility planning efforts include the proposed construction of a second wastewater treatment plant at the existing plant site which will operate parallel to the existing treatment plant. The proposed treatment plant will have a design capacity of approximately 300 gpm or 0.432 MGD to give a total treatment capacity of 500 gpm or 0.720 MGD. According to the City Engineer, the proposed plant will be under construction by mid-1988. The proposed parallel design will allow either treatment plant to be shut down for repairs and operational inspection.

Construction of the proposed wastewater treatment plant will ensure adequate wastewater treatment capacity for Runaway Bay beyond design year 2005 population projections. Construction of a future treatment plant in a separate area located on the west side of Lake Bridgeport and north of Jasper Creek is recommended in the 1971 "Engineering Report," (See Figure C-8). Based on the projected growth patterns for Runaway Bay construction of this future treament facility is not expected to occur for several years.

Conclusions. The City of Runaway Bay is active in facility planning to identify future wastewater collection and treatment requirements. Construction of a parallel wastewater treatment facility is planned for 1988 and will provide adequate wastewater treatment capacity for several years based on population projections for the newly identified Facility Planning

Area. Through continued efforts in facility planning by the City of Runaway Bay, Segment 0810 water quality should remain high.

Springtown Facility Planning Area

General. Springtown is incorporated and is located approximately 16 miles northwest of Fort Worth at the intersection of State Highway 199 and Farm to Market Road 51 in Parker County. Springtown lies within Segment 0809 which is comprised of Eagle Mountain Lake and its drainage area. The extraterritorial jurisdiction for Springtown extends to one-half mile beyond the city limits. The Springtown work force is characterized by those who commute into Fort Worth for employment.

Planning Area Boundaries. The Springtown Facility Planning Area (FPA) is shown on Figure C-9 and was determined by current city limit boundaries and projected population growth areas outside the current city limits. In addition, recommendations and other information offered by city personnel was considered. Projected population growth in the Springtown FPA is expected to the north and west along State Highway 199 and Farm to Market Road 51.

Population. In 1980 the Springtown population was estimated to be 1,658 persons, while the current 1987 population is estimated at 2,100 persons. Based on data developed from recent house counts, and a factor of 2.54 persons per household, the current Springtown FPA population is estimated to be 2,372 persons. The projected population for the Springtown FPA in design year 2005 is 3,678 persons. Table C-1 shows population projections for facility planning area towns, while Table C-2 shows population projections for small facility planning areas which is based on both the town and rural populations outside the city limits but within the FPA boundaries.

Existing Wastewater Facilities. The City of Springtown is currently served by one wastewater treatment facility with a design capacity of 260,000 gallons per day. The major components that comprise the treatment facility are bar screens, a grit chamber, an oxidation ditch, clarifiers, a chlorine contact chamber, and sludge drying beds. The plant is located 1.5 miles east of Springtown and the effluent is discharged into Walnut Creek which eventually empties into Eagle Mountain Lake in Segment 0809 of the Trinity River Basin.

The Texas Water Commission has issued an NPDES Permit (No. 10649-001) to the City of Springtown which allows for the following conditions:

Average daily flow	260,000 gpd
Peak daily flow	780,000 gpd
BOD (30-day average)	20 mg/l
BOD (7-day average)	30 mg/l
TSS (30-day average)	20 mg/l
TSS (7-day average)	30 mg/l

In 1986 the Springtown treatment plant flow and effluent concentrations were observed at:

Average daily flow	132,400 gpd
BOD (30-day average)	9.29 mg/l
TSS (30-day average)	11.64 mg/l

Conclusions. The Springtown wastewater treatment plant has been in operation less than two years, and based on the discharge permit limits, the historical plant effluent data, information offered by city personnel, and the design capacity, expansion or improvements to the treatment facility are unlikely in the immediate future unless more stringent permit requirements are imposed by the Texas Water Commission.

Chico Facility Planning Area

General. Chico is currently being served by one wastewater treatment facility, and since the current population and projected population growth are sufficient to warrant further facility planning studies, it has been designated as a facility planning area. Chico is located 7 miles north of Bridgeport along State Highway 101 and approximately 45 miles west of Denton in Wise County. The City is incorporated and has extraterritorial jurisdiction which extends one-half mile beyond the city limits. A large portion of the population in Chico work in the local rock quarrying and sand and gravel industries, in addition to those who are retired or employed in the petroleum and agricultural industries. Chico lies within Segment 0810 of the West Fork of the Trintiy River Basin.

Planning Area Boundaries. The Chico Facility Planning Area is shown on Figure C-10 and was based upon the current Chico city limit boundaries in addition to other anticipated growth areas outside the city limits. Recommendations and information input by city personnel was also considered. The areas of projected growth in Chico are anticipated to be along Farm to Market Road 1810 on the western edge of the city.

Population. The population of Chico was estimated to be 890 persons in 1980, and the current population is approximately 1,000 persons. The Chico Facility Planning Area population is 1,066 persons at the present time, and was determined from data taken from recent house counts and a factor of 2.54 persons per household. The projected population for the Chico FPA in design year 2005 is 1,383 persons. Table C-1 shows population projections for small facility planning area towns, while Table C-2 shows population projections for small facility planning areas, which is based upon both the city and rural populations outside of the city limits but within the FPA boundaries.

Existing Wastewater Facilities. The City of Chico is currently utilizing an overland flow type of wastewater treatment system. The treatment plant is located southeast of the city approximately two-thirds of a mile east of State Highway 101 and one-half mile south of Farm to Market Road 1810. The major components of the treatment system include a lift station, two sedimentation basins, an overland flow field with a surface application system, and a collection ditch at the toe of the field. The wastewater is treated by the overland flow system, collected at the base of the field, metered, and then conveyed to the rock crushing facility adjacent to the treatment plant to be reused for washing crushed rock. The reused wastewater is then transported to a holding pond.

The Texas Water Commission has issued an NPDES Permit (No. 10023.001) to the City of Chico and it allows for the following conditions:

Average daily flow	76,000 gpd
BOD (30-day average)	20 mg/l
TSS (30-day average)	90 mg/l

The actual flow and effluent concentrations observed from the treatment plant in 1986 are as follows:

Average daily flow	78,300 gpd
BOD (30-day average)	11.29 mg/l
TSS (30-day average)	20.14 mg/l

Conclusions. The existing wastewater treatment plant was completed in March 1984. The observed flow through the system, however, frequently exceeds the flow limits set forth by the permit. As a result, the City is investigating the possibility of acquiring additional land to incorporate another sedimentation basin as well as another overland flow field. The

City is being assisted by a private engineering consultant in the feasbility, design, and funding considerations for the expansion and improvement of the existing plant. It should also be noted that the City has initiated an inflow/infiltration monitoring program for improving and upgrading the existing collection system utilized by the City of Chico.

Planning efforts by the City of Chico to improve existing wastewater treatment facilities are continuing, and therefore, the water quality of Segment 0810 is expected to remain high. Therefore, no treatment plant effluent requirements are expected for Chico.

Paradise Facility Planning Area

General. The Community of Paradise is located in Wise County 6 miles southeast of Bridgeport along State Highway 114, approximately 29 miles northwest of Fort Worth. Paradise is unincorporated with a population consisting mainly of retirees and those involved in local farming, the petroleum industry, and rock quarrying industries, the local school system, and those who commute to Fort Worth businesses.

Planning Area Boundaries. The Paradise Facility Planning Area is shown on Figure C-11 and was based on the general configuration of the town as well as anticipated growth areas in the community. Recommendations and information given by town personnel were also considered.

Population. The estimated 1987 population for the Paradise Facility Planning Area, which was determined by current house counts and a 2.54 person per household factor, is 462 people. This figure corresponds closely to estimates given by town personnel. Population projections for the design year 2005 show approximately 651 persons living in the Paradise FPA. This projection is based upon the rural Wise County population estimates from the 1987 NCTCOG population report. Table C-1 gives population estimates for

facility planning area communities while Table C-2 shows population estimates for facility planning areas that include both town and rural populations within the facility planning area.

Existing Wastewater Facilities. Paradise is presently served by individual on-site wastewater disposal systems. The U.S. Soil Conservation Service Soil Survey for Wise County shows that relative to suitability for use as a absorbtion field for septic systems the soil within the Paradise Facility Planning Area is distributed according to the following estimated percentages:

Slight limitations	0	percent
Moderate limitations	25	percent
Severe limitations (percs slowly)	60	percent
Severe limitations (depth to rock or flooding)	15	percent

Soils within the Paradise FPA are clayey with some sandy clay areas, and based on the percentages above, there is a potential for septic tank system absorption field problems due mainly to slow percolating soils and shallow soil depths to rock.

Proposed Wastewater Facilities. Paradise is unincorporated and is being served under septic tank conditons. As a result of the projected increases in population, the potential septic system problems due to the unsuitability of the soil, and the changes in the State's septic system regulations, a wastewater collection system and treatment plant is recommended for the Paradise Facility Planning Area. The Paradise Independent School District (ISD) is currently investigating the design feasibility of a wastewater treatment system for a new 500 to 1,000 student capacity school.

Figure C-11 shows a possible layout for a wastewater collection system and treatment facility to serve the Paradise FPA. A plant capacity on the order of .065 MGD should be adequate to serve all persons within the Paradise Facility Planning Area.

Table C-5 summarizes the estimated costs of a possible wastewater collection and treatment system to serve Paradise.

Conclusions. A localized wastewater treatment management plan has been proposed for the Paradise Facility Planning Area. If the proposals are accepted and instituted by these communities, water quality is expected to improve in Segment 0810 of the West Fork of the Trinity River.

Poolville Facility Planning Area

General. Poolville is located in Parker County and is 30 miles northwest of Fort Worth along Farm to Market Road 920, 3 miles south of State Highway 199, and is unincorporated. The Town of Poolville consists mostly of people who are involved in farming, the petroleum industry, the local school, and also those who commute to Fort Worth businesses.

Planning Area Boundaries. The Poolville Facility Planning Area (FPA) is shown on Figure C-12 and was determined by the general layout of the town as well as those areas which were expected to grow in the community. Also considered were recommendations and information gathered from town personnel.

Population. The population of Poolville was estimated to be 287 persons in 1980, and the current 1987 population is estimated at 390 persons. The current estimated Poolville Facility Planning Area population is 431 persons based on recent house counts and a factor of 2.54 persons per household. The Poolville Facility Planning Area population in design year 2005 is

expected to be 716 persons. Table C-1 gives population projections for facility planning area communities while Table C-2 shows population projections for small facility planning areas that include both town and rural populations.

Soil Suitability for Septic Systems. Poolville is currently being served by individual on-site wastewater disposal systems. The U.S. Soil Conservation Service Soil Survey shows that relative to suitability for use as an absorbtion field for septic systems the soils within the Poolville FPA area are distributed according to the following estimated percentages:

Slight limitations	10 percent
Moderate limitations	10 percent
Severe limitations (percs slowly)	75 percent
Severe limitations (depth to rock or flooding)	5 percent

The soil composition within the Poolville FPA is comprised mostly of clays with some sandy clays. It is apparent that there is a potential for septic system absorption field problems within the Poolville Facility Planning Area due mainly to slow percolation of soils and shallow soil depths.

Proposed Wastewater Facilities. Poolville is currently served by individual on-site wastewater disposal systems and the population is projected to increase. There is a potential for septic tank system problems due to the unsuitability of soil, in addition to recent changes to the State's septic tank system regulations, and as a result, a wastewater collection and treatment system is recommended for the Poolville Facility Planning Area. The Poolville Independent School District (ISD) has investigated the possibility of installing a wastewater treatment facility at the local school, but has decided to retain its septic tank system.

Figure C-12 shows one possible configuration for a wastewater collection and treatment system to serve the Poolville FPA. A treatment plant capacity of approximately .072 MGD should be adequate to serve the Community of Poolville.

Table C-6 is a summary of the estimated costs of a possible wastewater collection and treatment system to serve Poolville.

Conclusions. The Town of Poolville is currently served by individual on-site wastewater disposal systems and has a population density sufficient to warrant a wastewater collection and treatment system. Poolville can incorporate and become the management agency for the Poolville FPA or approach an existing agency to perform the duties of the management agency responsible for serving the wastewater collection and treatment needs of the Poolville FPA through design year 2005.

Lake Bridgeport Facility Planning Area

General. The City of Lake Bridgeport is located in Wise County on the east side of Lake Bridgeport and is served by individual on-site wastewater disposal systems. The City's population consists mostly of retired persons and those employed by the local rock quarrying and petroleum industries.

Planning Area Boundaries. The Facility Planning Area for Lake Bridgeport is shown on Figure C-13, and was determined by the current city limits as well as anticipated growth areas. Recommendations and information given by city peronnel was also considered.

Population. The current 1987 population estimate for the City of Lake Bridgeport is approximately 350 persons based on current house counts and a 2.54 persons per-household factor. This figure corresponds favorably to

that given by city personnel. The Lake Bridgeport Facility Planning Area population for 1987 shows approximately 415 persons and is based upon the same criteria. Population projections for the Lake Bridgeport Facility Planning Area in design year 2005 show 642 persons living in the area, and is based upon rural Wise County population estimates from the 1987 North Central Texas Council of Governments (NCTCOG) Population Report. Table C-1 presents population projections for facility planning area towns, while Table C-2 shows population projections for small facility planning areas that include both town and rural populations within the FPA.

Soil Suitability for Septic Systems. All existing homes and businesses within the Lake Bridgeport FPA are currently served individual by on-site wastewater disposal systems. The U.S. Soil Conservation Service Soil Survey shows relative to the suitability for use as obsorption fields the soils within the Lake Bridgeport Facility Planning Area are distributed according to the following percentages:

Slight limitations	0 percent
Moderate limitations	0 percent
Severe limitations (percs slowly)	80 percent
Severe limitations (depth to rock or flooding)	20 percent

The soils within the Lake Bridgeport FPA are clayey with some sandy clay areas. This summary of soil conditions the Lake Bridgeport FPA shows that there is a potential for septic system drainage field problems related to soil unsuitability because of slow percolating rates and shallow soil depths to rock.

Proposed Wastewater Facilities. A wastewater collection and treatment system would benefit the Lake Bridgeport FPA because it is served by

individual on-site wastewater disposal systems and there is a potential for problems due to unsuitable soil conditions. In addition, increases in population are projected for the Lake Bridgeport FPA and recent changes in the Texas Department of Health "Construction Standards for On-Site Sewerage Facilities" have been adopted.

A wastewater treatment facility with a capacity of .064 MGD should be adequate to serve the projected needs of Lake Bridgeport Facility Planning Area through design year 2005.

Figure C-13 shows a general layout of a wastewater collection and treatment system for the Lake Bridgeport Facility Planning Area. As a result of the topography and location of the in relation to the lake, lift stations characterize the wastewater collection system.

Table C-7 is a summary of the estimated costs for a wastewater collection and treatment system.

Conclusions. The City of Lake Bridgeport is currently served by individual on-site wastewater disposal systems and has a population density sufficient to warrant construction of a wastewater collection and treatment system. Poor soil conditions and stricter State septic system regulations for future development point to the need for facility planning to construct a wastewater collection and treatment system to serve the needs of the Lake Bridgeport Facility Planning Area through design year 2005.

Alvord Facility Planning Area

General. The City of Alvord is 66 miles southeast of Wichita Falls and is situated at the intersection of U.S. Highway 287 and Farm to Market Road 1655 in Wise County. Alvord lies within Segment 0810 of the West Fork of the Trinity River Basin. The City of Alvord is incorporated and has

extraterritorial jurisdiction which extends one-half mile beyond the city limits.

Planning Area Boundaries. The Alvord Facility Planning Area (FPA) is shown on Figure C-14 and was determined by using current city limit boundaries as well as other projected areas of growth outside the city limits. Recommendations and information given by city personnel was also considered. Anticipated areas of growth in Alvord are expected to take place to the north and west of the city limits.

Population. The Alvord population was estimated at 874 persons in 1980, while the current 1987 population is estimated at 1,050 persons. The current Alvord Facility Planning Area population is estimated to be approximately 1,065 people based upon data developed by recent house counts and a factor of 2.54 persons per household. Population for the Alvord Facility Planning Area for design year 2005 to show approximately 1,521 persons. Table C-1 shows population projections for facility planning area towns, while Table C-2 shows population projections for small facility planning areas, which is based upon both the city and rural populations outside of the city limits but still within the FPA boundaries.

Existing Wastewater Facilities. The City of Alvord is presently operating one wastewater treatment facility with a design capacity of 180,000 gpd. Major components of the existing treatment facility include a lift station, a race-track style oxidation ditch, clarifiers, a chlorine contact chamber, and sludge drying beds.

The existing wastewater treatment plant is located approximately 1 mile from downtown Alvord in the southwest corner of the city limits. The plant effluent is discharged into an unnamed creek which flows into Chicken Creek, that empties into Big Sandy Creek, which eventually discharges into Segment

0810 of the West Fork of the Trinity River, approximately 12 miles south of Alvord.

The Texas Water Commission has issued an NPDES Permit (No. 10036.001) to the City of Alvord which allows for the following conditions:

Average daily flow	112,000 gpd
BOD (30-day average)	20 mg/l
TSS (30-day average)	30 mg/l

During 1986, the following treatment plant flow and effluent concentrations were observed:

Average daily flow	51,200 gpd
BOD (30-day average)	4.42 mg/l
TSS (30-day average)	11.92 mg/l

Conclusions. The City of Alvord has initiated a facility planning study to identify future wastewater collection and treatment needs. The City hired a private engineering consultant to prepare a feasibility study and facility design for a new wastewater treatment plant or an upgrading or expansion of the existing facility. The City of Alvord is active in facility planning to serve the needs of the Alvord Facility Planning Area through design year 2005.

TABLES

TABLE C-1

FACILITY PLANNING AREA TOWN POPULATIONS

Area	1980	1987	1990	2000	2005
Alvord[1]	874	1,050	1,125	1,375	1,500
Briaroaks[1]	592	850	960	1,330	1,520
Bridgeport	3,737	3,850	3,900	4,060	4,140
Chico[1]	890	1,000	1,050	1,210	1,290
Decatur[2]	4,104	4,588	4,725	5,440	5,840
Jacksboro[1]	4,000	4,000	4,000	4,000	4,000
Joshua[2]	1,470	4,830	5,420	7,400	8,910
Lake Bridgeport[1]	271	350	385	495	550
Paradise[1]	388	462	494	599	651
Poolville[1]	287	390	430	580	650
Runaway Bay[1]	504	800	930	1,350	1,560
Springtown[1]	1,658	2,100	2,290	2,920	3,240

[1]Linear extrapolation used to project populations to 1990, 2000, and 2005.

[2]From individual cities master plan projections.

TABLE C-2

SMALL FACILITY PLANNING AREA POPULATIONS[1]

Area	1980	1987[2]	1990	2000	2005
Alvord	887	1,065	1,141	1,394	1,521
Briaroaks	962	1,376	1,553	2,145	2,446
Bridgeport	4,008	4,173	4,245	4,479	4,597
Chico	945	1,066	1,121	1,296	1,383
Decatur	4,230	4,738	4,885	5,634	6,052
Jacksboro	4,164	4,178	4,184	4,203	4,213
Joshua	1,757	5,214	5,846	7,965	9,544
Lake Bridgeport	325	415	455	580	642
Paradise	388	462	494	599	651
Poolville	318	431	475	639	716
Runaway Bay	504	800	930	1,350	1,560
Springtown	1,866	2,372	2,590	3,312	3,678

[1]These numbers include both rural and town populations for each area delineated. The 1980 and 1987 town figures come from the Texas Department of Health Population Data System, "1980 Census of Population - Number of Inhabitants, Texas," and "North Central Texas Council of Governments Current Population Estimates for 1987." The 1987 town numbers were checked with local city officials to determine accuracy. The 1987 rural populations are based on actual house counts. All rural populations and 1990, 2000, and 2005 town projections are based on linear extrapolation.

[2]Town population portion of these numbers come from individual city master plan projections.

TABLE C-3

CITY OF DECATUR
COMPARISON OF ALTERNATES[1]

	Alternate B	Alternate C	Alternate D	Alternate E	Alternate F	Alternate G
Upgrade Existing Plant (Immediate Construction)	$137,000	$137,000	$137,000	$137,000	$137,000	$137,000
Collection System	--	1,545,000	1,801,000	605,500	706,000	712,000
New NW Treatment Plant	--	800,000	--	--	--	--
New NE Treatment Plant	--	--	--	663,000	683,000	--
Existing Collection System Improvements	--	--	--	--	--	352,000
Year 2000 Existing Plant Upgrade	263,000	--	263,000	--	--	263,000
	$400,000	$2,482,000	$2,201,000	$1,405,500	$1,526,000	$1,464,000
Annual O&M[2]	49,000	108,000	49,000	111,000	111,000	53,000

1 Source: "Preliminary Engineering Report, Sanitary Sewage System for the City of Decatur," December 1987, Draft Copy, Rady and Associates, Inc.

2. Lift stations and treatment plants only.

TABLE C-4

COST SUMMARY FOR BRIAROAKS FPA

Briaroaks	Treatment level 30/30	20/20	Without ammonia removal 10/15	With ammonia removal 10/15
2005 population served	1,520	1,520	1,520	1,520
Treatment plant capacity, MGD	.152	.152	.152	.152
Total collection system capital cost	$606,000	$606,000	$606,000	$606,000
Treatment plant capital cost	$700,000	$770,000	$860,000	$1,000,000
Annualized capital cost[a]	$100,000	$106,000	$113,000	$ 124,000
Annual O&M costs[b]	$ 27,000	$ 29,000	$ 40,000	$ 50,000
Total annual costs	$127,000	$135,000	$153,000	$ 174,000
Annual cost per household[c]	$ 212	$ 226	$ 256	$ 291

[a]Based on 4.5 percent interest, 20-year term.

[b]For collection system and treatment plant.

[c]Based on 2.54 persons per household in service area and 2005 population.

TABLE C-5

COST SUMMARY FOR PARADISE FPA

Paradise	Treatment Level 30/30	20/20	Without ammonia removal 10/15	With ammonia removal 10/15
2005 population served	651	651	651	651
Treatment plant capacity, MGD	.065	.065	.065	.065
Total collection system capital cost	$630,000	$630,000	$630,000	$630,000
Treatment plant capital cost	$360,000	$440,000	$480,000	$550,000
Annualized capital cost[a]	$ 76,000	$ 82,000	$ 86,000	$ 91,000
Annual O&M costs	$ 98,000	$ 27,000	$ 34,000	$ 45,000
Total annual costs	$ 98,000	$109,000	$120,000	$136,000
Annual cost per household	$ 382	$ 425	$ 468	$ 531

[a]Based on 4.5 percent interest, 20-year term.

[b]For collection system and treatment plant.

[c]Based on 2.54 persons per household in service area and 2005 population.

TABLE C-6

COST SUMMARY FOR POOLVILLE FPA

Poolville	Treatment Level 30/30	20/20	Without ammonia removal 10/15	With ammonia removal 10/15
2005 population served	716	716	716	716
Treatment plant capacity, MGD	.072	.072	.072	.072
Total collection system capital cost	$488,000	$488,000	$488,000	$488,000
Treatment plant capital cost	$400,000	$460,000	$520,000	$580,000
Annualized capital cost[a]	$ 68,300	$ 73,000	$ 78,000	$ 82,000
Annual O&M costs	$ 21,000	$ 26,000	$ 33,000	$ 44,000
Total annual costs	$ 89,300	$ 99,000	$111,000	$126,000
Annual cost per household[c]	$ 317	$ 351	$ 394	$ 447

[a]Based on 4.5 percent interest, 20-year term.

[b]For collection system and treatment plant.

[c]Based on 2.54 persons per household in service area and 2005 population.

TABLE C-7

COST SUMMARY FOR LAKE BRIDGEPORT FPA

Lake Bridgeport	Treatment level 30/30	20/20	Without ammonia removal 10/15	With ammonia removal 10/15
2005 population served	642	642	642	642
Treatment plant capacity, MGD	0.064	0.064	0.064	0.064
Total collection system capital cost	$1,222,000	$1,222,000	$1,222,000	$1,222,000
Treatment plant capital cost	$ 350,000	$ 430,000	$ 470,000	$ 540,000
Annualized capital cost[a]	$ 121,000	$ 127,000	$ 130,000	$ 136,000
Annual O&M costs[b]	$ 40,000	$ 45,000	$ 52,000	$ 63,000
Total annual costs	$ 161,000	$ 172,000	$ 182,000	$ 199,000
Annual cost per household[c]	$ 637	$ 680	$ 720	$ 787

[a]Based on 4.5 percent interest, 20-year term.

[b]For collection system and treatment plant.

[c]Based on 2.54 persons per household in service area and 2005 population.

FIGURES

INDEX TO FIGURES

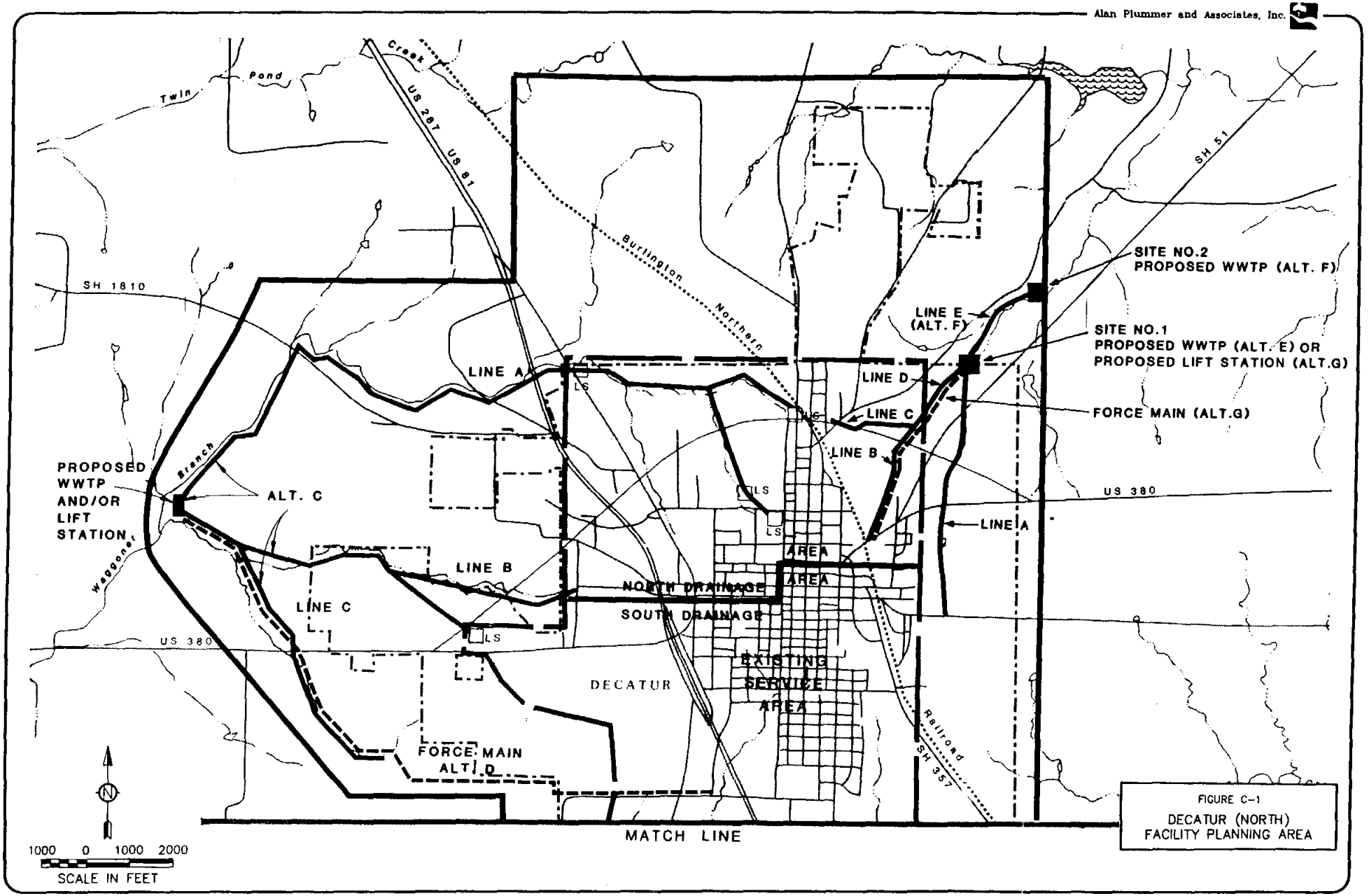


FIGURE C-1
DECATUR (NORTH)
FACILITY PLANNING AREA

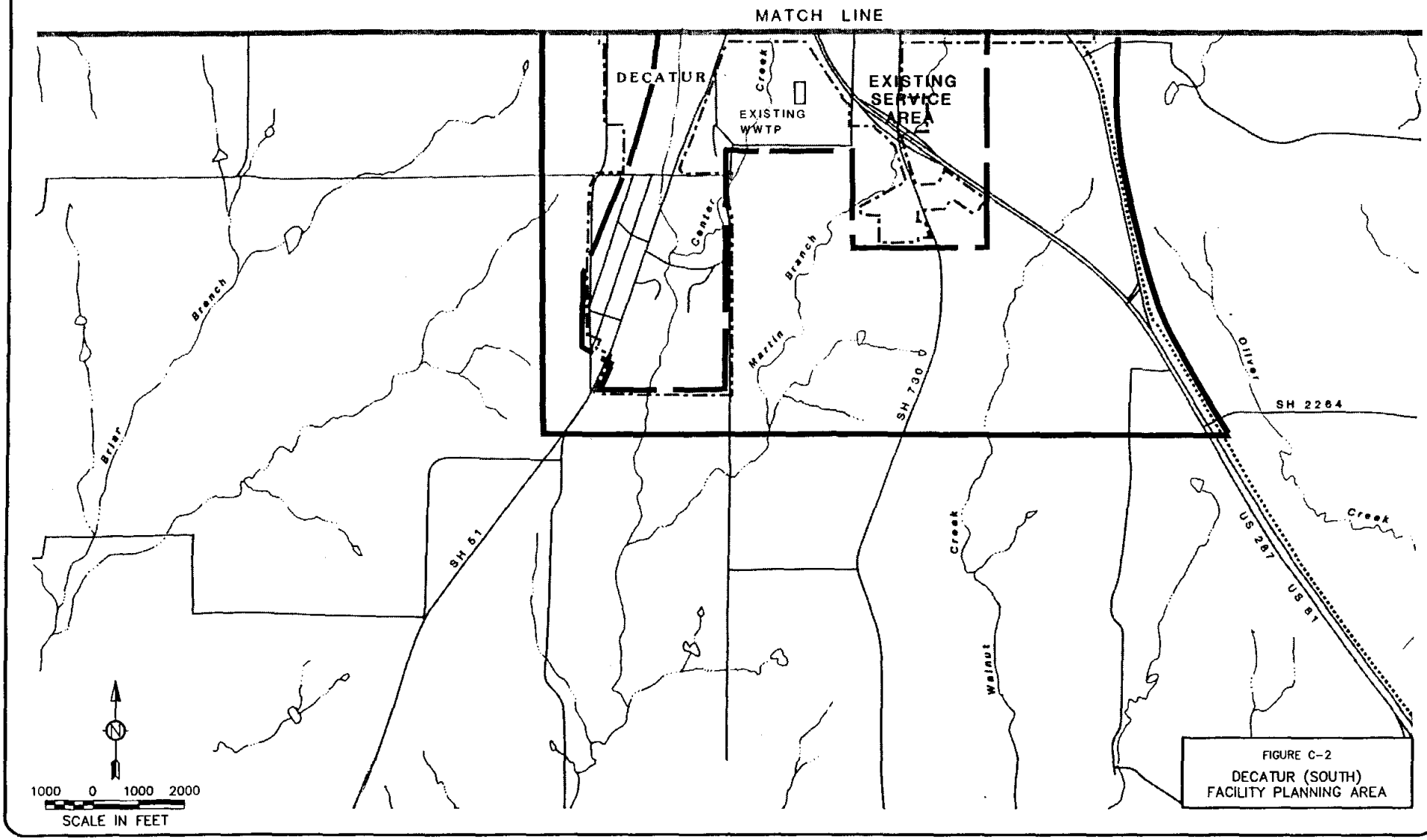


FIGURE C-2
DECATUR (SOUTH)
FACILITY PLANNING AREA

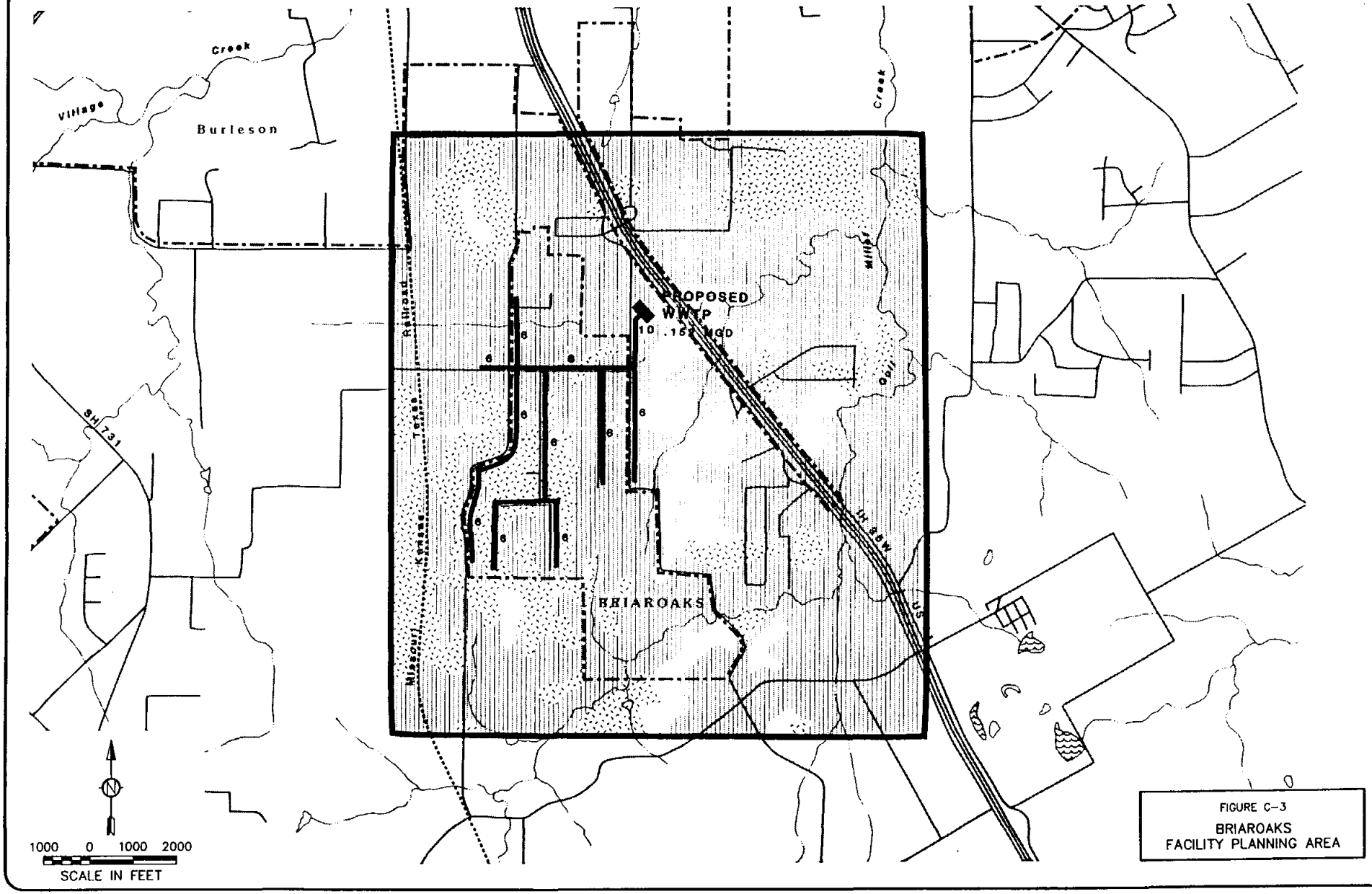


FIGURE C-3
BRIAROAKS
FACILITY PLANNING AREA

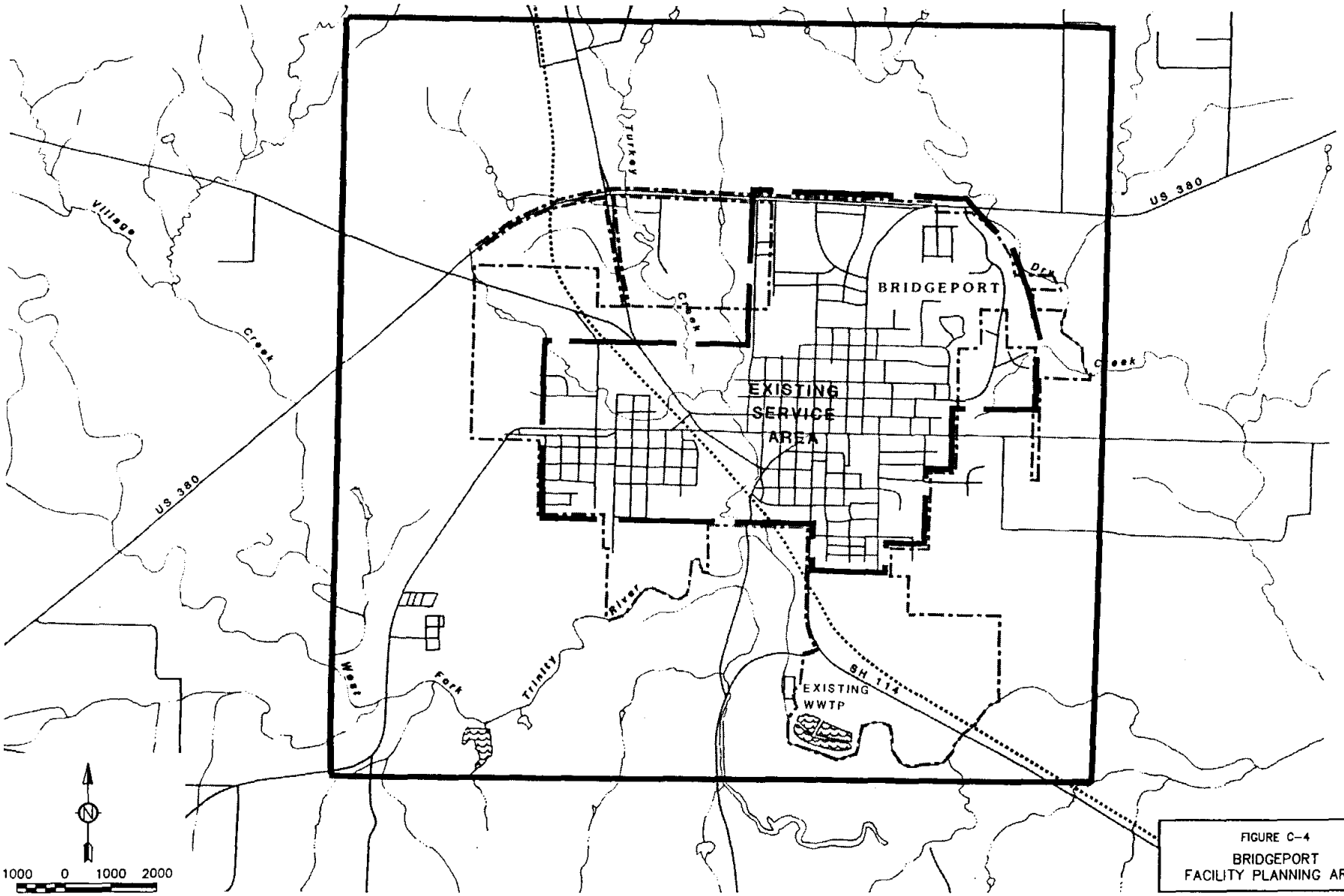


FIGURE C-4
BRIDGEPORT
FACILITY PLANNING AREA

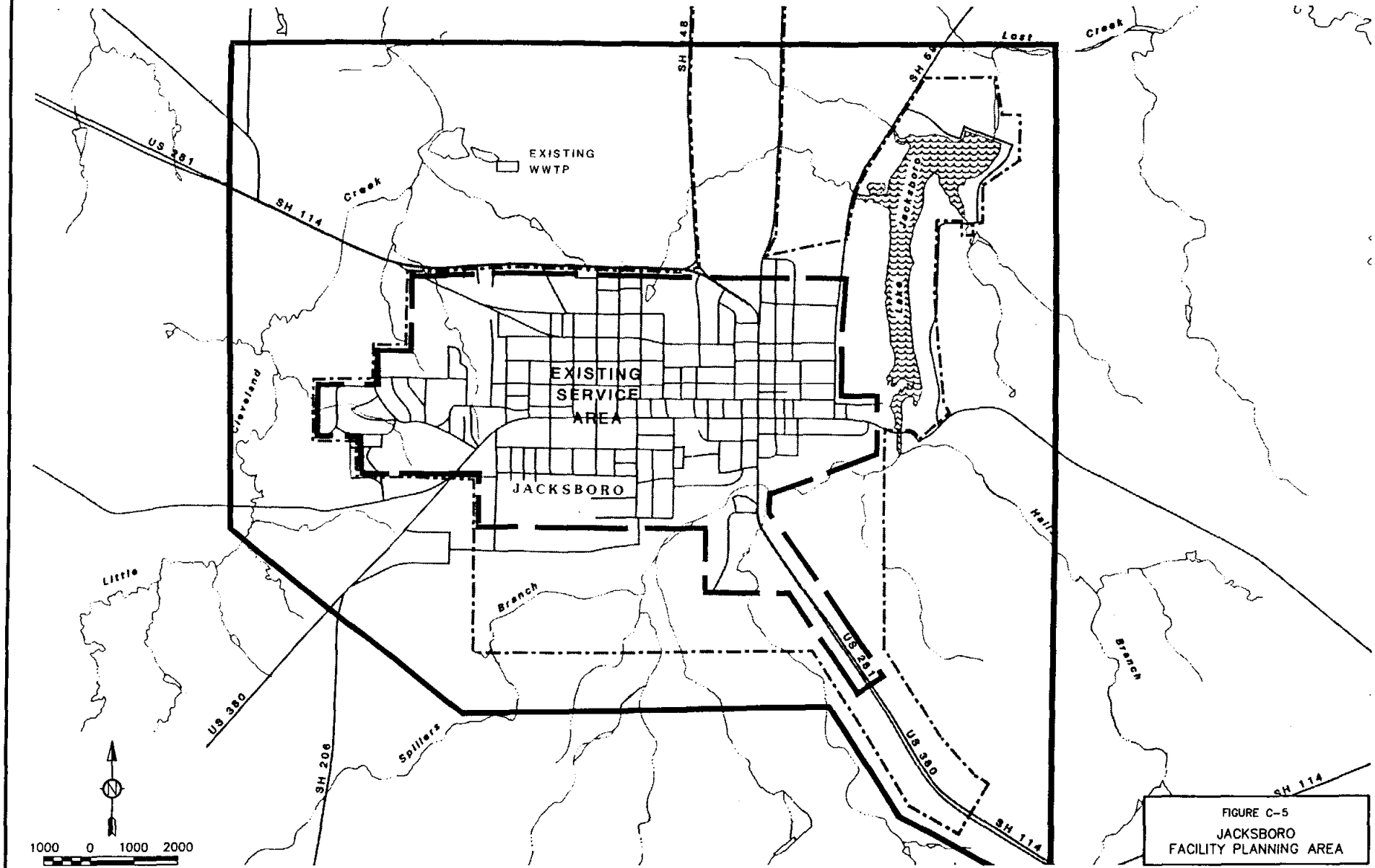
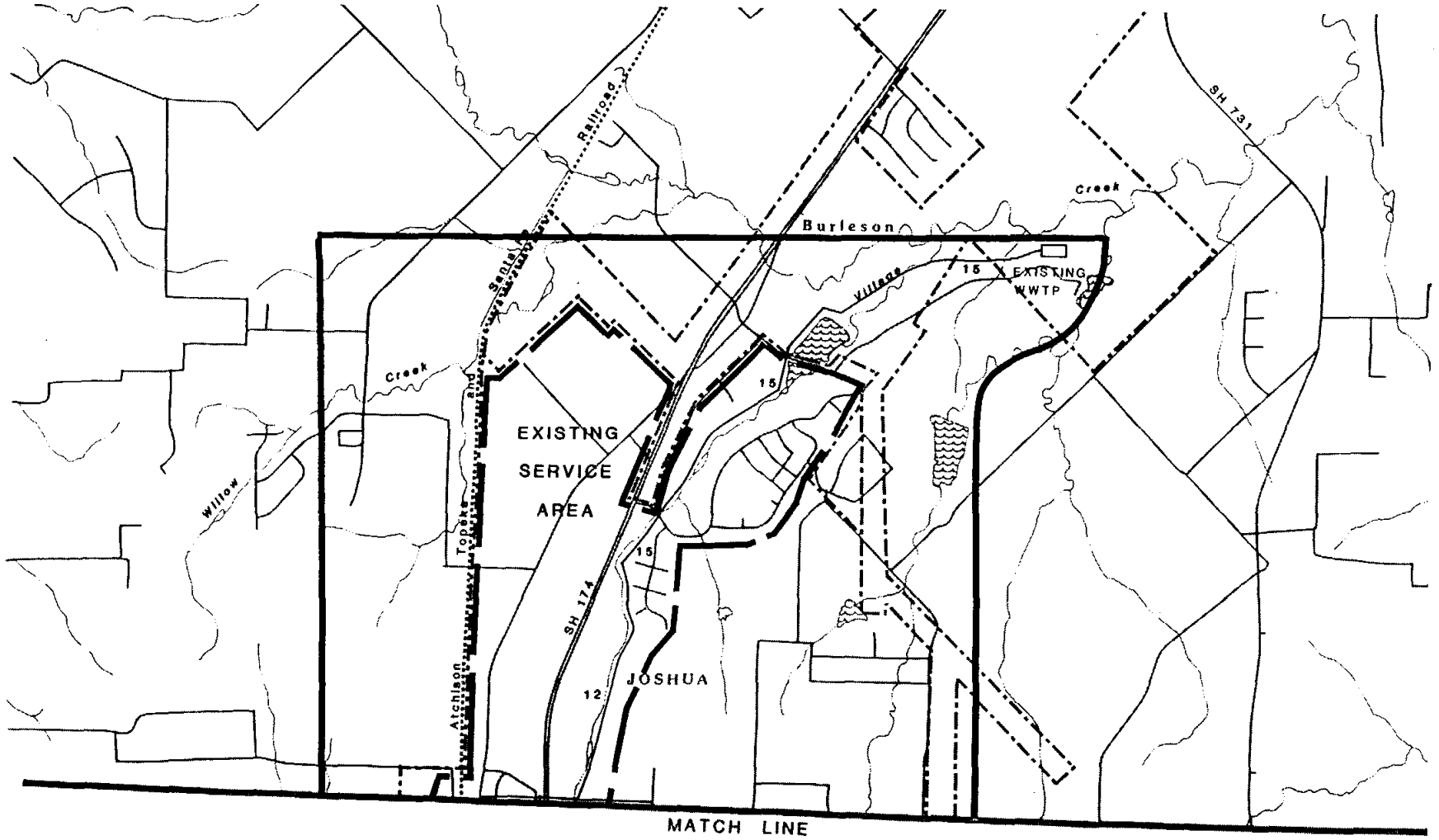


FIGURE C-5
JACKSBORO
FACILITY PLANNING AREA



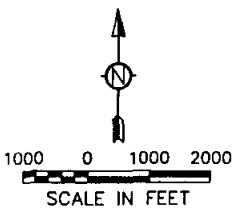


FIGURE C-6
JOSHUA (NORTH)
FACILITY PLANNING AREA

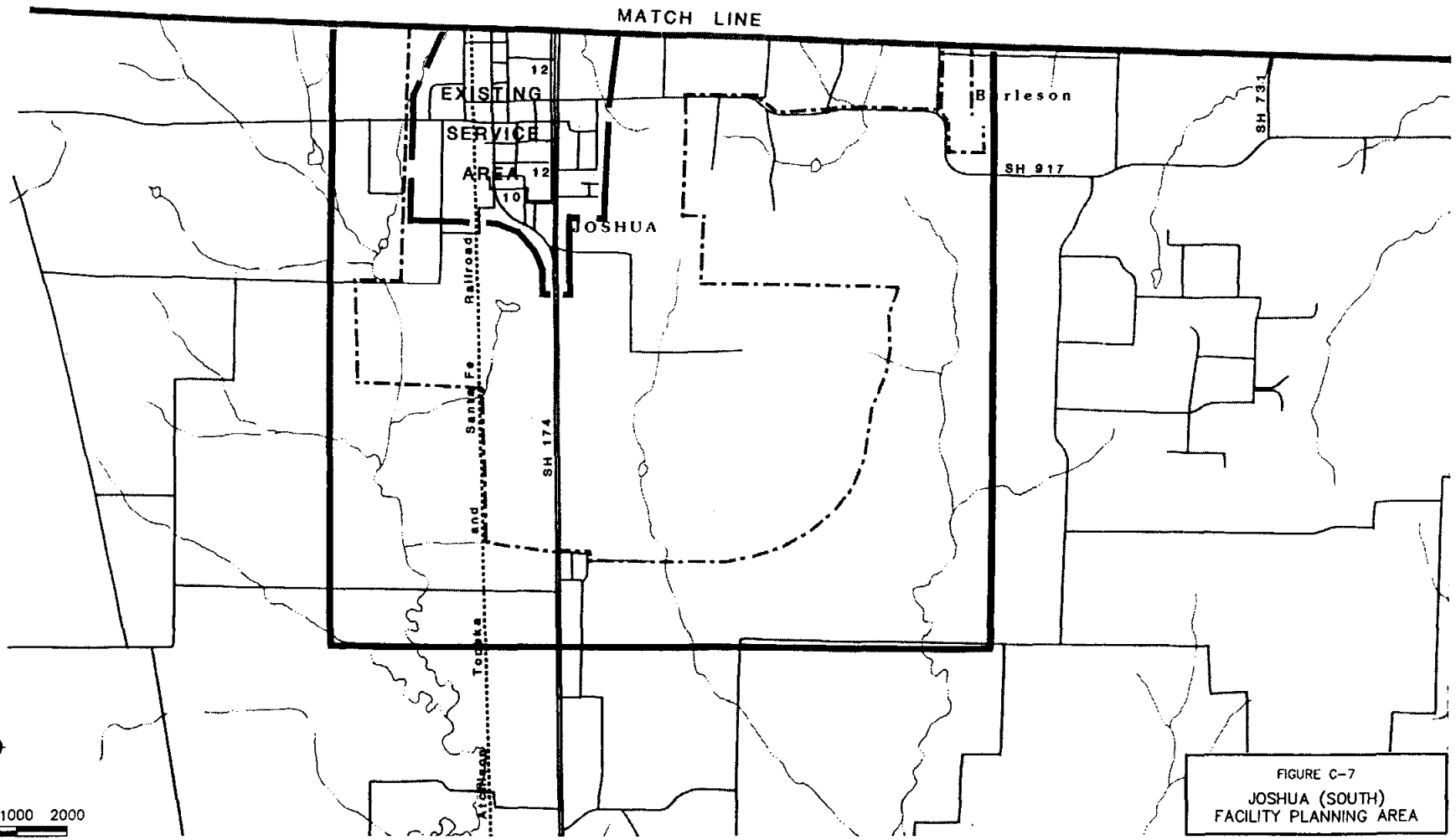


FIGURE C-7
JOSHUA (SOUTH)
FACILITY PLANNING AREA

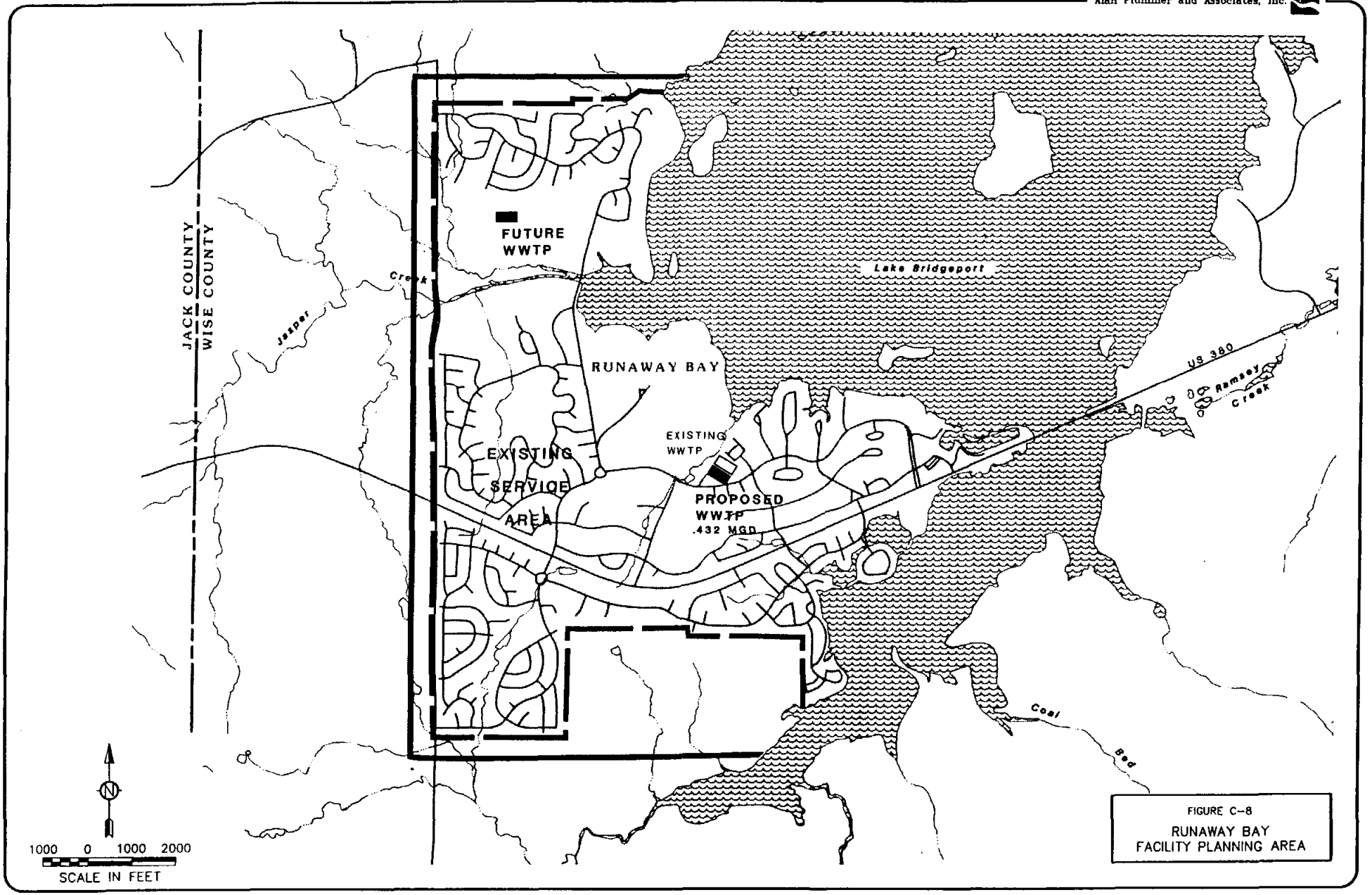


FIGURE C-8
RUNAWAY BAY
FACILITY PLANNING AREA

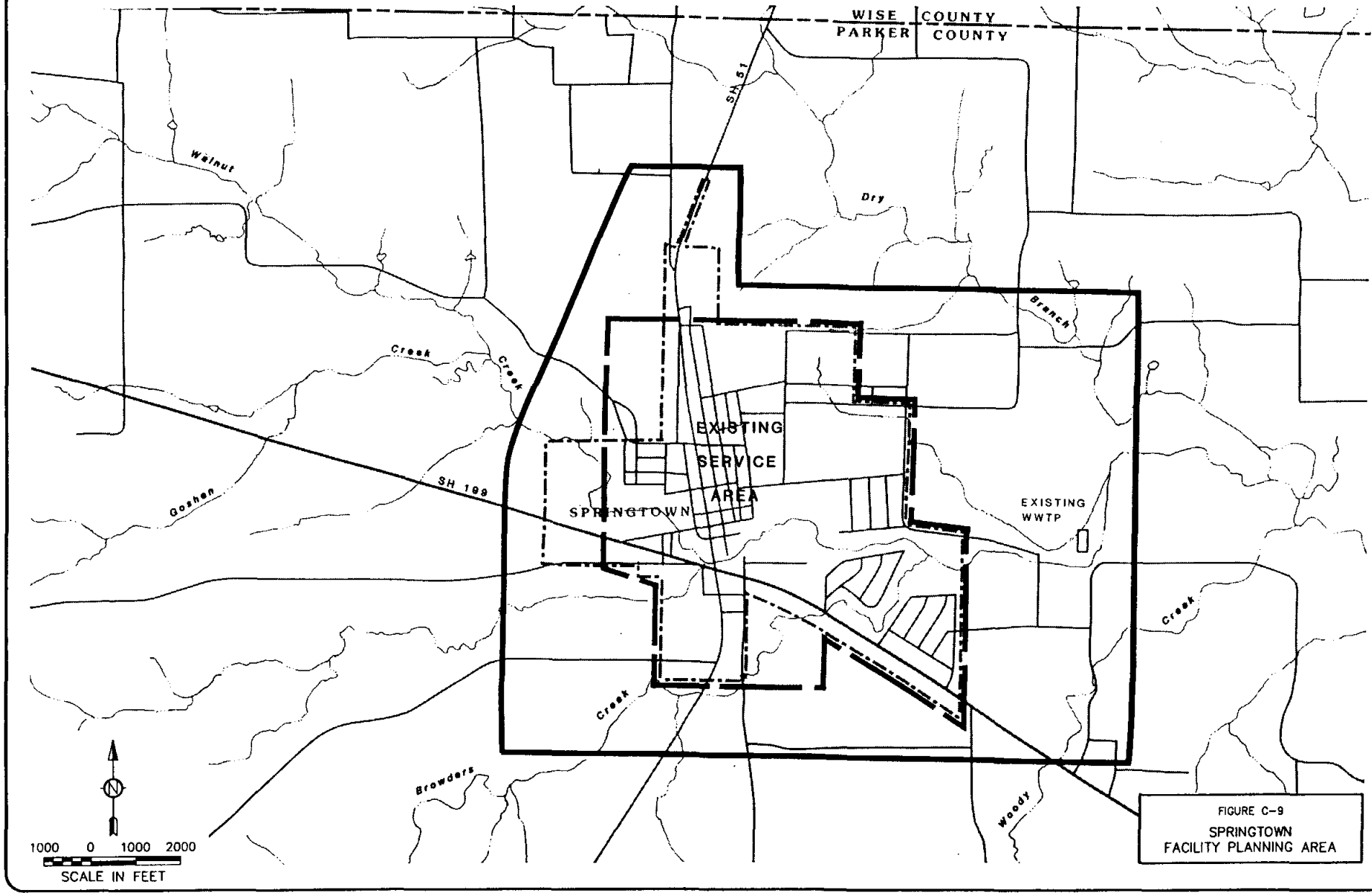


FIGURE C-9
SPRINGTOWN
FACILITY PLANNING AREA

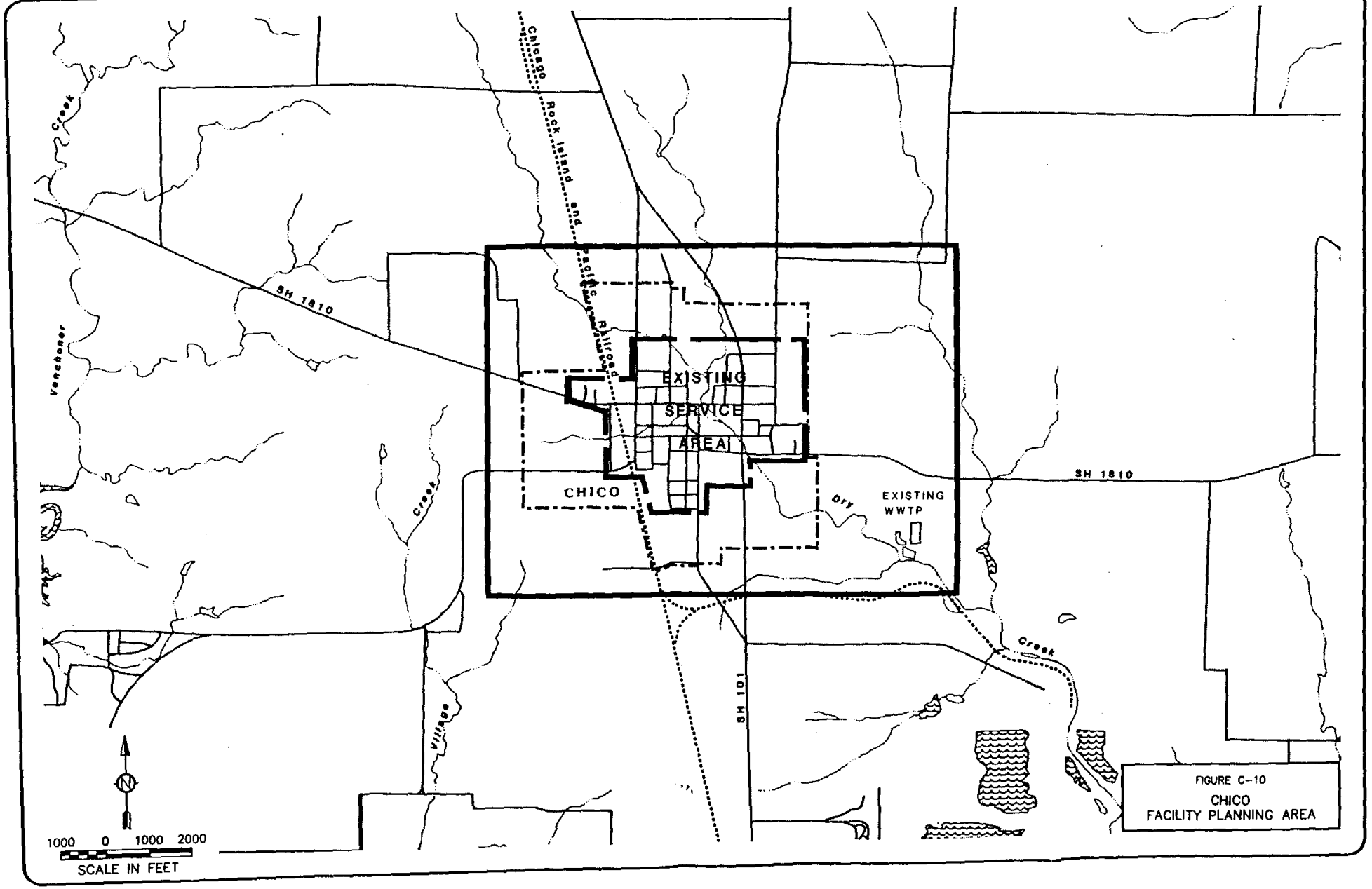


FIGURE C-10
CHICO
FACILITY PLANNING AREA

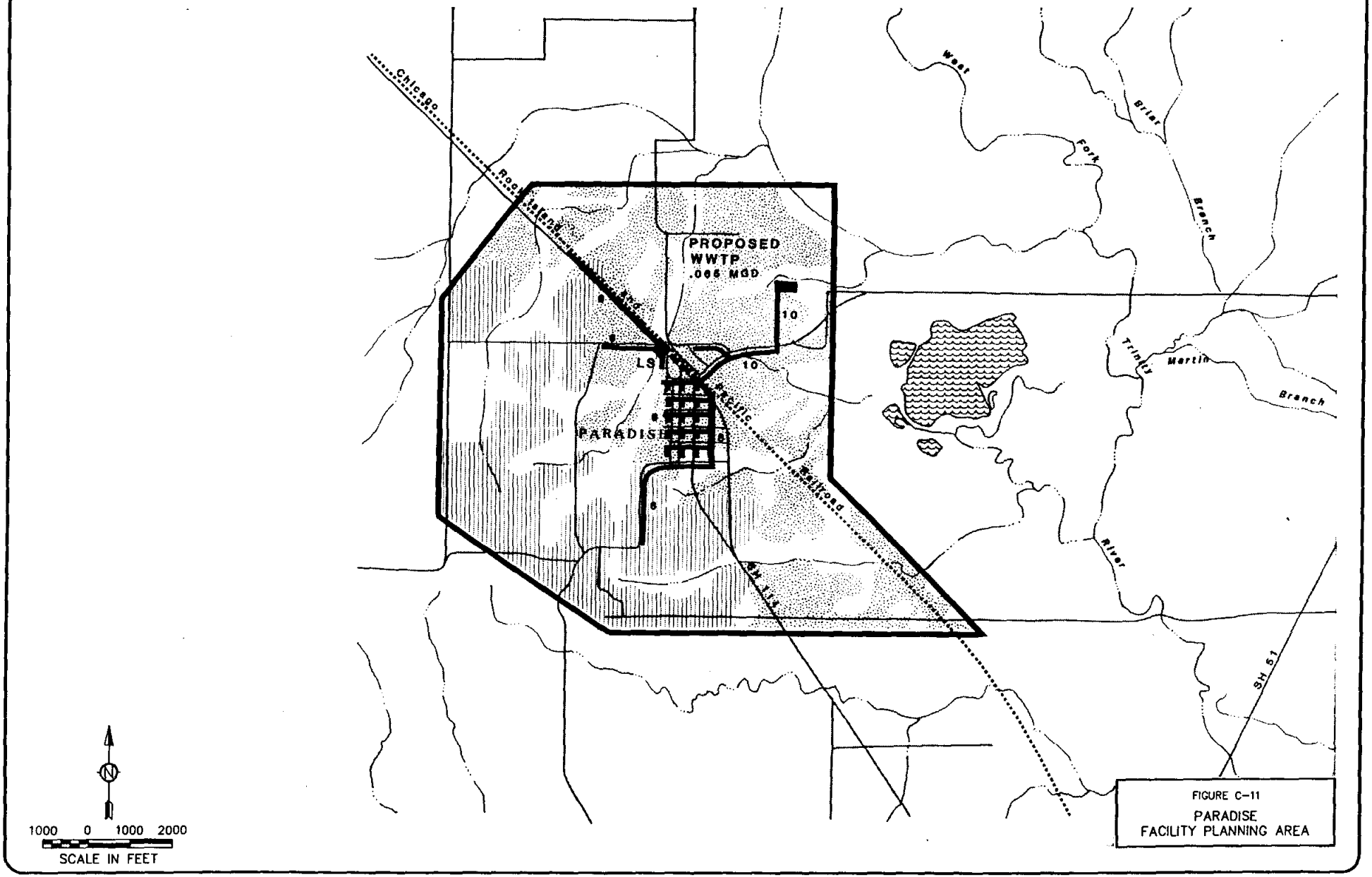


FIGURE C-11
PARADISE
FACILITY PLANNING AREA

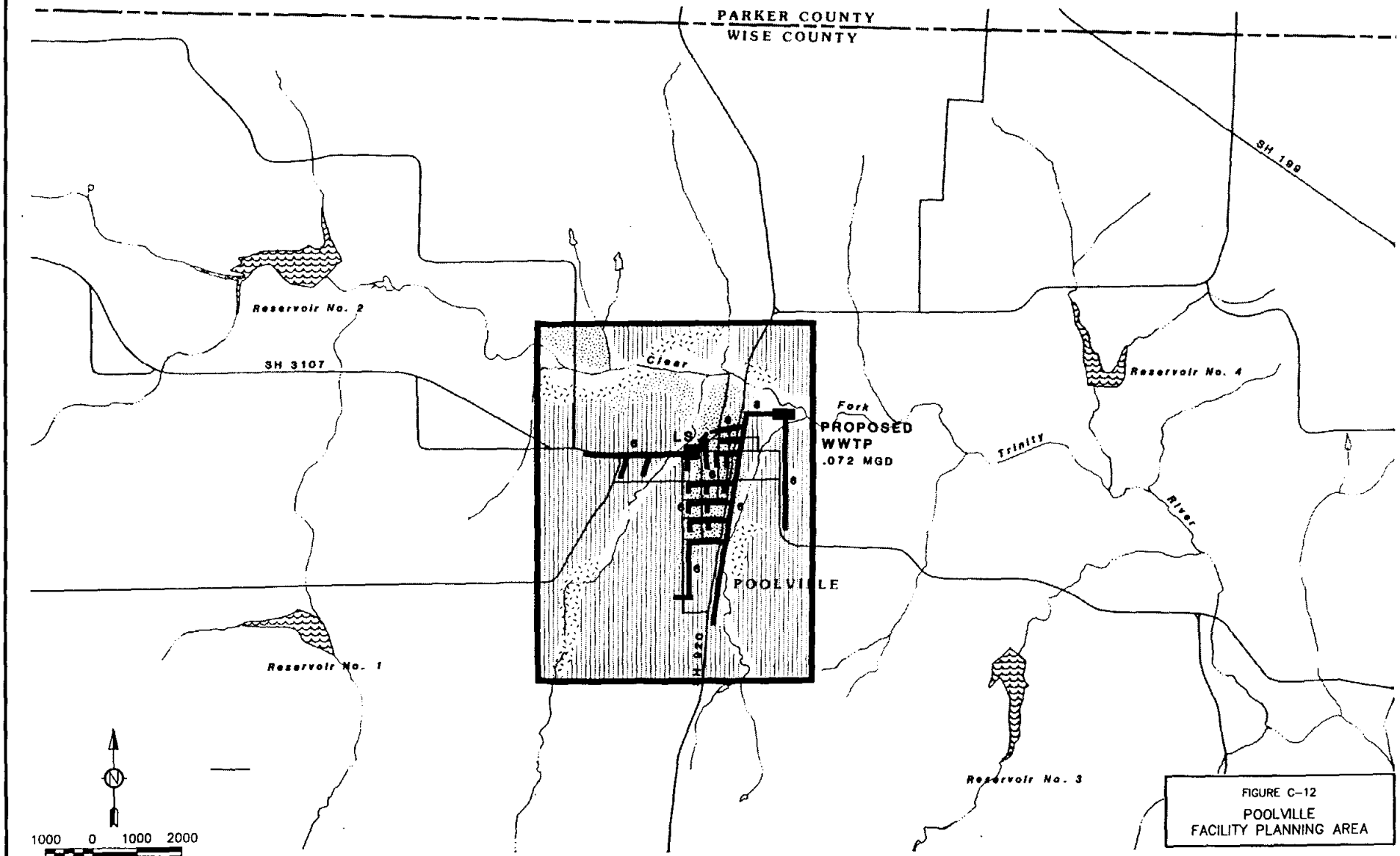


FIGURE C-12
POOLVILLE
FACILITY PLANNING AREA

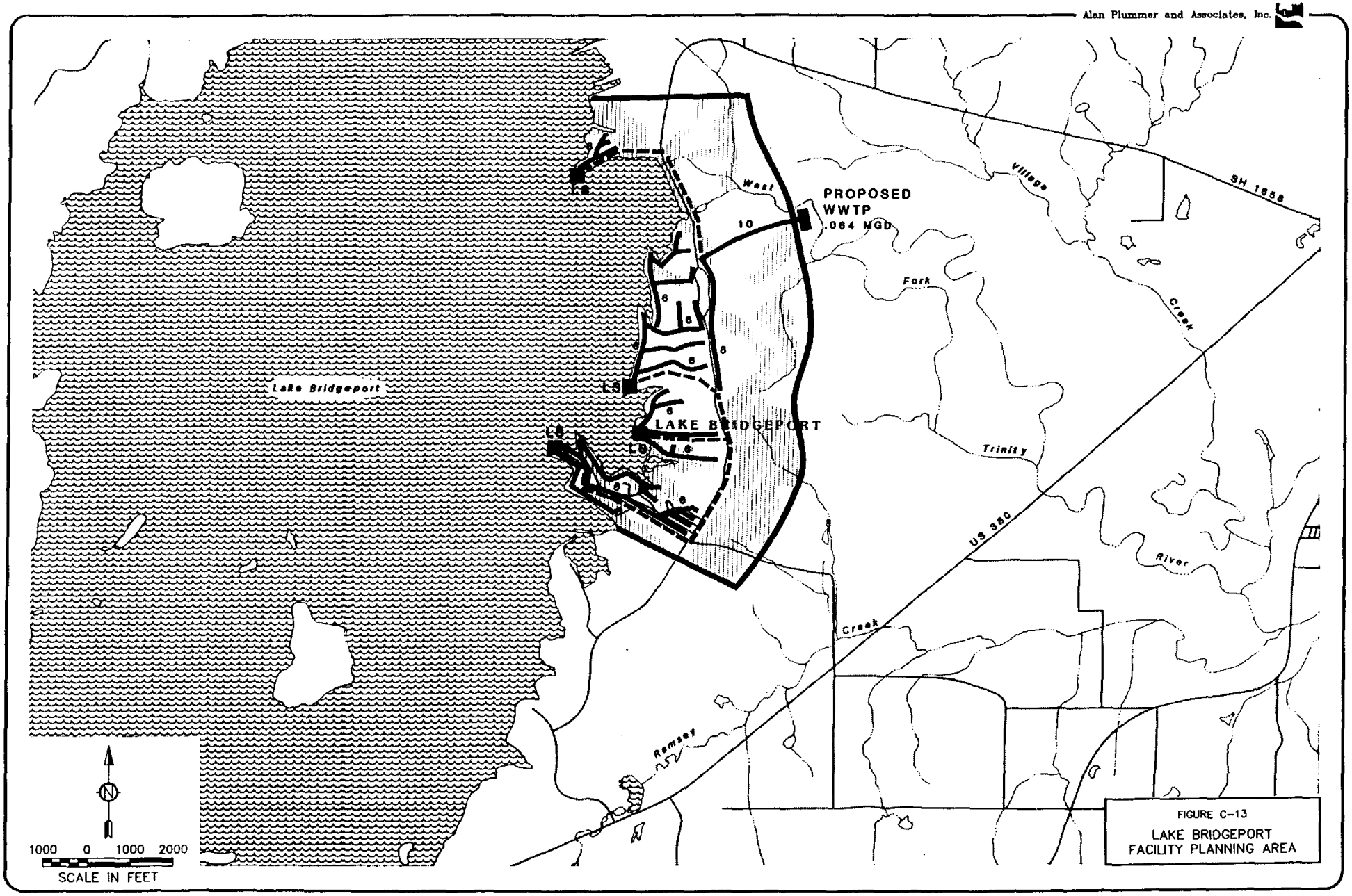


FIGURE C-13
LAKE BRIDGEPORT
FACILITY PLANNING AREA

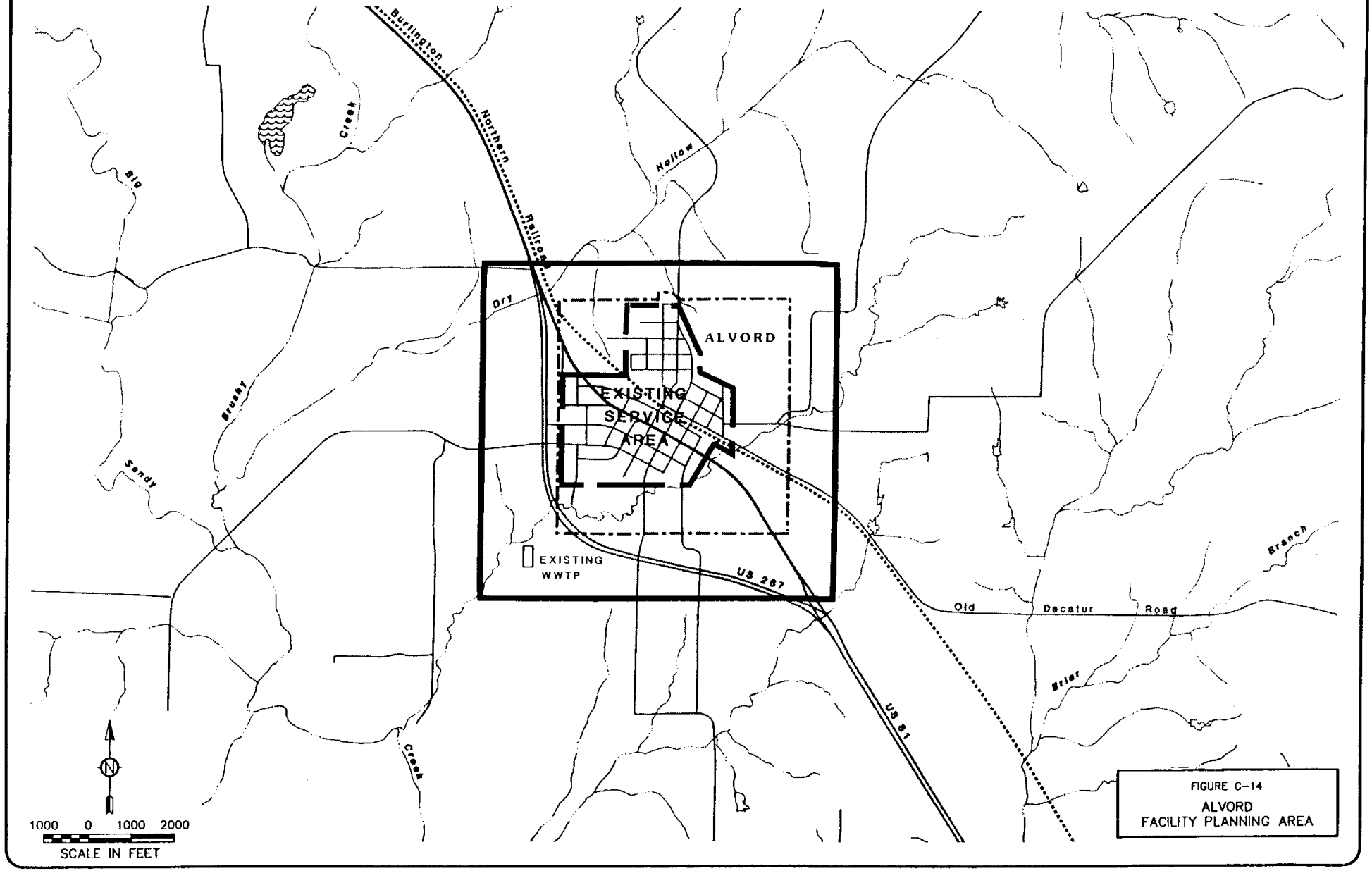


FIGURE C-14
ALVORD
FACILITY PLANNING AREA