CHAPTER 2 - BACKGROUND INFORMATION

List of Tables

List of Figures

A. Existing Environment

1. Surface Water and Groundwater

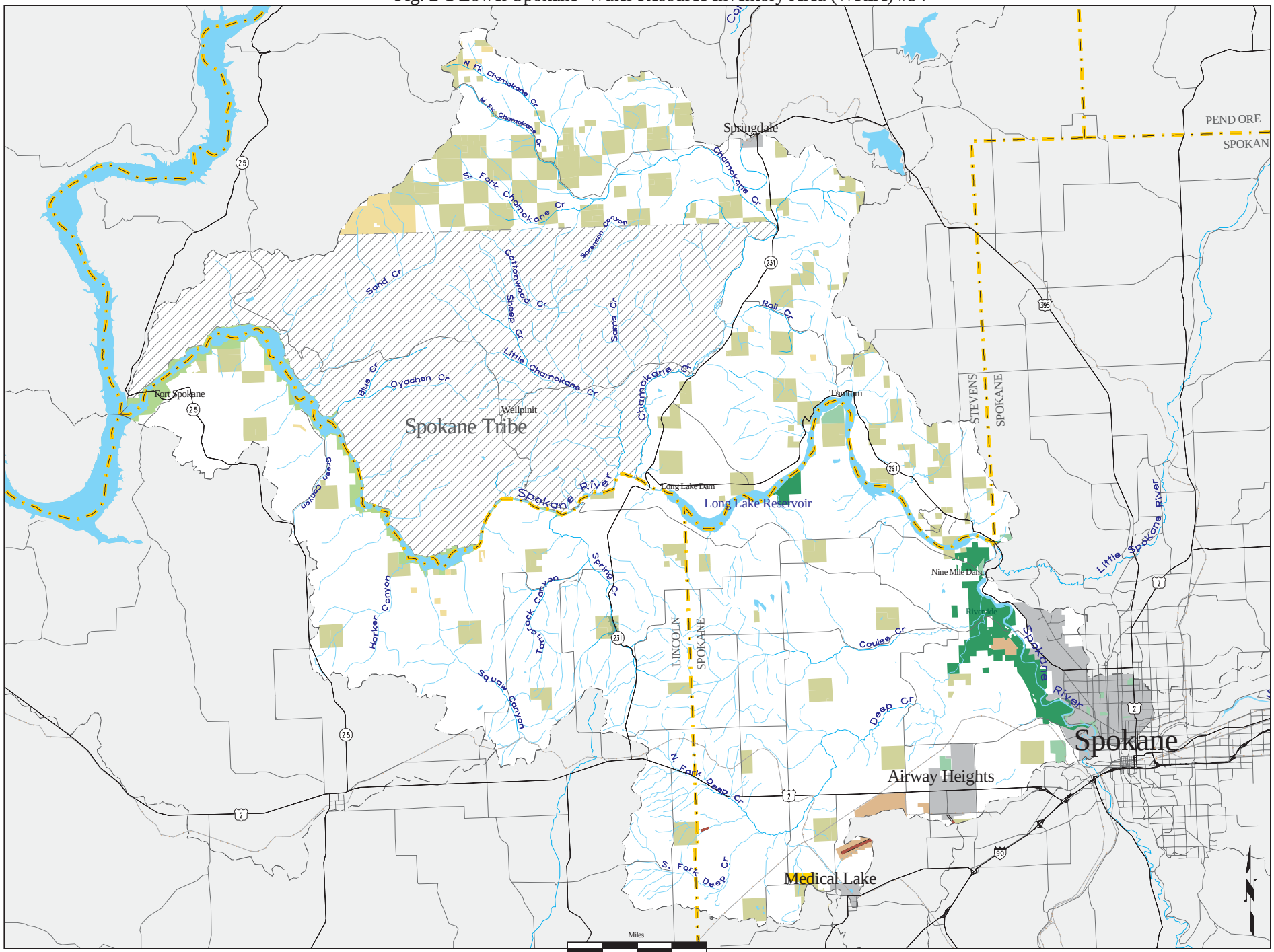
The City's service area lies wholly within WRIA 54 (Figure 2-1). A portion of the surface watershed drains into Deep Creek, which ultimately discharges into the Spokane River above the Nine Mile Dam. Runoff in the underground watershed area percolates through the underlying soil, and appears to act as a recharge area for the Wanapum and Grande Ronde aquifers. These aquifers are not designated as "sole-source" aquifers, but drinking water for a number of Airway Heights and north-western Spokane County area residents is obtained through shallow domestic wells.

The City of Airway Heights is the purveyor that draws water from wells within the WRIA. The city has several wells located within the City limits (WRIA 54) and has recently placed into service a well located approximately 2 miles south of the City (WRIA 34 - Figure 2-2). There are also private wells and small water systems within these watersheds that provide water to single family residences outside the jurisdiction of the City.

2. Atmosphere and Weather

Data for atmospheric characteristics within the Airway Height's service area was derived from the NOAA and U.S. Weather Service records for Spokane. The elevation of the service area varies from about 2400 feet above MSL on the westerly edge of the service area (near the intersection of Highway 2 and Craig Road) to 2370 feet at the southeast corner of the service area, to about 2330 feet at the northeast corner of the service area. The average elevation of the service area is 2,360 feet above MSL. Weather conditions are similar to those at Spokane International Airport 2 miles to the south. Table 2-1 summarizes atmospheric conditions in the study area. Table 2-2 summarizes the average precipitation on a monthly basis. Table 2-3 summarizes average maximum and minimum temperatures on a monthly basis.

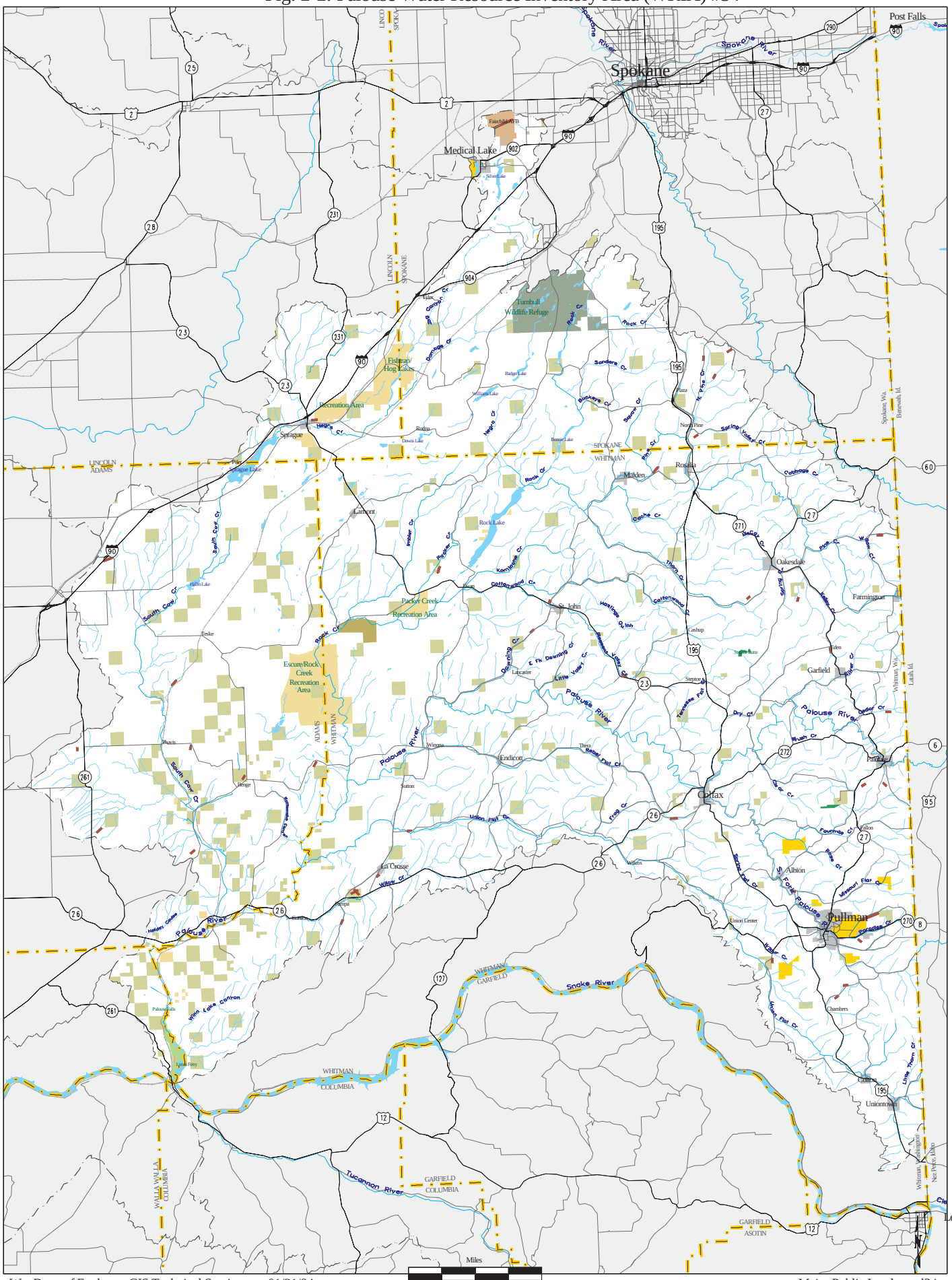
Fig. 2-1 Lower Spokane Water Resource Inventory Area (WRIA) #54



Wa. Dept. of Ecology, GIS Technical Services 01/21/04

Major Public Lands mpl54

Fig. 2-2: Palouse Water Resource Inventory Area (WRIA) #34



Wa. Dept. of Ecology, GIS Technical Services 01/21/04

Major Public Lands mpl34

Table 2-1. Normal Atmospheric / Weather Conditions

PARAMETER	NORMAL VALUE
Average Maximum Temperature	32.9ºF – January 83.9ºF – July
Average Minimum Temperature	21.6ºF - January 55.7ºF - July
Average Annual Precipitation	16.07 inches/year
Average Evaporation Rate	48 inches/year
Average Days of Cloud Cover/Rainfall	191 days
Average Days with Rainfall (>0.01”)	111 days
Maximum One Day Rainfall	1.66 inches
Average Wind Speed	9.1 mph
Average Relative Humidity	52-77%

Data Sources: Western Regional Climate Center

Table 2-2. Precipitation Averages

MONTH	SPOKANE WSO AP
January	1.98
February	1.55
March	1.38
April	1.12
May	1.39
June	1.20
July	0.55
August	0.62
September	0.80
October	1.18
November	2.10
December	2.20
Annual Total	**16.06**

Data Source: Western Regional Climate Center

Table 2-3. Atmospheric Averages Normal Temperature

Month	Average Max. Temperature (F)	Average Min. Temperature (F)
January	32.9	21.6
February	39.1	25.1
March	48.2	30.5
April	58.2	36.5
May	67.0	43.7
June	74.2	50.1
July	83.9	55.7
August	82.7	54.5
September	72.5	46.6
October	59.2	37.5
November	42.9	30.0
December	34.8	24.4
Annual	58.0	38.0

Data obtained from the Western Regional Climate Center's web page at www.wrcc.sage.dri.edu. Reported data is from Spokane Airport weather data.

3. Land

The soils in the City's service area are mostly silty loam according to the National Resource Conservation Service's Maps for Spokane County (Appendix C.1 - NRCS Spokane County Soils Survey maps 62 and 71). A combination of basalt flows and a series of floods from Glacial Lake Missoula formed the City's service area. Relatively thin surface soils overlay a basaltic foundation, with "pocket wetlands" forming in areas where flood action has created scour pockets to collect groundwater. The area can be generally characterized as sparsely vegetated grassland and scrub land, with occasional timbered areas, and seasonal wetlands. The soils in the District's service area are mainly classified as Cheney (Cg and Ch) according to the Soil Conservation Service's maps for Spokane County.

There is evidence of at least one, and possibly two, subsurface channels ('paleochannels') in the area, trending from south to north. Portions of the Wanapum and Grande Ronde aquifer units underlie the area; groundwater generally moves from the southwest to the north and east, toward Deep Creek and the Spokane River. ("Hydrogeology of the West Plains Area of Spokane County, Deobald and Buchanan, Eastern Washington University, May, 1995). (Figure 2-3).

The preferred site is not located within an identified 100-year floodplain. A copy of the City's FIRM Map is included at Appendix C.2

4. Sensitive Areas

Within the City's service area, the primary ecological concern is the water quality in the various shallow aquifers underlying the service area. The City of Airway Heights plays a key role in preserving groundwater quality. The City provides not only provides water and sewer service, but also for the reduction, minimization, and/or elimination of pollutants from groundwater, including those contained in stormwater.

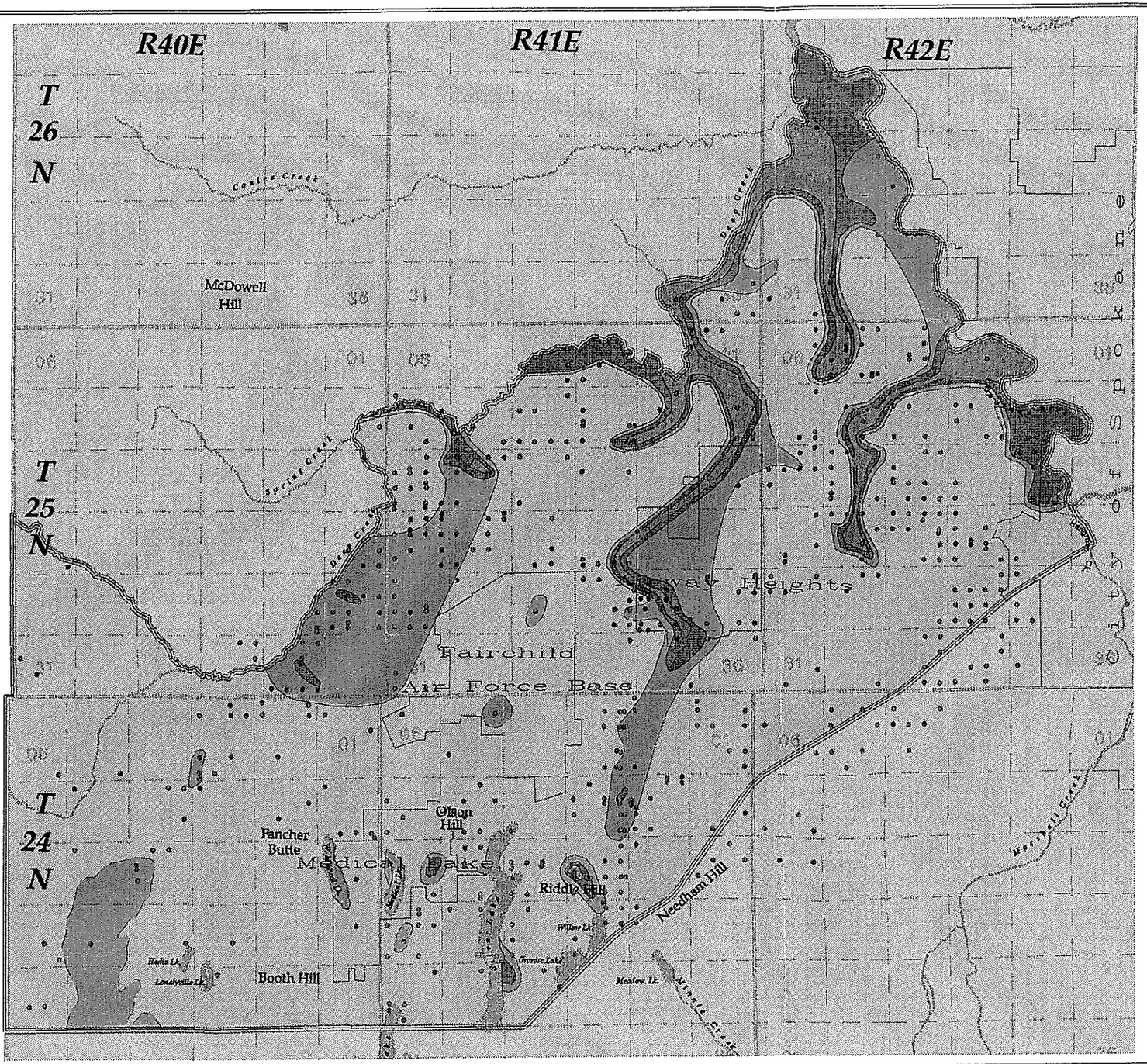
There are wetlands (marshes, swamps, bogs) within the watershed and within the City's service area. The Spokane County Priority Habitat & Species map indicates an ecologically-sensitive "Prairie and Steppe" area south of the City's service area. An extract of the Spokane County Priority Habitat & Species map is provided at Figure 2-4.

The Washington State Department of Fish & Wildlife - Eastern Region Office indicates that a Priority Habitat/Species location for the Western Bluebird may exist at the northerly portion of the City Limits. This location is approximately three miles north of the preferred site (see Figure 2-4).

The Washington State Office of Historic Preservation (OAHP) has indicated that the area may contain culturally sensitive locations. A cultural records survey will be needed, and construction activities will need to be aware of the potential of encountering culturally sensitive material. A copy of correspondence with OAHP is included at Appendix C.3.

Figure 10

Thickness of the overburden



Thickness area boundaries

Dashed where uncertain

West Plains Study Area boundary

Well site

0 - 50

51 - 100

101 - 200

201+

Scale: 1:120,000

Miles 0 1 2 3 4 5

Kilometers 0 1 2 5 10

Data: Bill Deobald; surface geology derived from Wa. State Department of Natural Resources Geology map: 1990 1:100000

Map: Spokane County WQMP-GIS February 02, 1995

Fish & Wildlife Critical Areas

LEGEND

- Urban Nat Open Space
- Old Growth Forest
- Prairies and Steppe
- White-Tailed Deer
- Elk Habitat
- Moose Habitat
- Wetland Habitat
- Raptor Habitat
- Riparian Zone
- Cliffs/Bluffs
- Cavity Nesting
- Waterfowl
- Amphibian
- Water Body
- Marsh
- Endangered Species
- Threatened Species
- Candidate Species
- Monitored Species
- White-Tailed Deer Range
- Elk Habitat Range
- Inc. Boundary
- Highway

Pend Oreille County

Stevens County

Lincoln County

Whitman County

Whitman County

State of Idaho

Deer Park
Camden
Elk
Reflection Lake
Milan
Dragoon Lake
Bear Lake
Chattaroy
Dragoon Creek
Little Spokane River
West Branch Little Spokane River
Mt Spokane
Elev. 5878
Colbert
Dartford
Dead man Creek
Mead
Newman Lake
Moab
Otis Orchards
Knight Lake
Lake Spokane
Horseshoe Lake
Woods Lake
Nine Mile Falls
Seven Mile
Spokane River
Town of Millwood
City of Spokane
City of Spokane Valley
City of Liberty Lake
Shelley Lake
Liberty Lake
Hite
Deep Creek
Airway Heights
Fairchild A.F.B.
Espanola
Latah Creek
Medical Lake
Hadlin Lake
Lonelyville Lake
Silver Lake
Medical Lake
Ring Lake
Otter Lake
Clear Lake
Grange Lake
Willow Lake
Four Lakes
Meadow Lake
Marshall
Queen Lake
Fish Lake
Cheney
Tyler
Browne's Mountain
Elev. 3144
Mica Peak
Elev. 5225
Mica
Valleyford
Freeman
Rock Creek
Rockford
Spangle
Turnbull
Wildlife Refuge
Phillips Lake
Fairfield
Waverly
Plaza
Latah
Spring Valley
Pine Creek
Rodna
Williams Lake
Amber Lake
Badger Lake
Chapman Lake
Medical Lake
Bonnie Lake
Fivemile Creek
Mason Lake
Fish Lake
#8
#12
#14
#19
#20
#21
#23
#26
#27
#28
Washington

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SPOKANE COUNTY

April 1, 2004
/plan3/wildlife/spokane02/phs1117.aml

Spokane County

5. Endangered Species/Wildlife Habitat

The West Plains ecosystem supports a variety of wildlife. Migratory waterfowl frequent the pocket wetlands. The Spokane River is home to many species of fish and waterfowl. There are no known endangered species that reside or migrate in or out of the City's service area. An extract of the Spokane County Wetlands Critical Areas map is provided at Figure 2-5.

The Northwest Habitat Institute (NHWI) map at Figure 2-6 indicates a mix of Urban & Mixed, Agricultural, Pasture & Mixed, and Shrub-Steppe environs in the vicinity of the preferred site.

The preferred site is located north of and directly adjacent to a Shrub Steppe habitat area mapped in Section 36, T. 25 N, R41 E, W.M.. The Washington State Department of Fish & Wildlife (WSDF&W) researched their records to determine whether habitat for a priority species exists at the location of the preferred site. In early October 2004, WSDF&W confirmed that an important habitat is located approximately ½ mile south of the preferred site. WSDF&W also notes that a Habitat Management Plan would not be needed for this site (Appendix C.4).

The City would need to obtain approval of any required Habitat Management plans prior to approval of the construction documents, should further information indicate the presence of a priority habitat or species.

6. Public Health

Based on information obtained from the District and the DOH, there have been no known cases of public illness or disease directly attributed to the sewage collection or treatment systems. However, earlier reports (Wyatt-Jaykim, 1988) noted that the Spokane County Health Department had found elevated nitrate levels in domestic water wells, apparently due to the to proliferation of septic drainfield disposal systems. A study conducted by Deobald and Buchanan (May 1995) reports that ground water quality in the study area was generally good, with water quality parameters within acceptable limits, excepting a shallow overburden well.

Many of the parcels located outside the City limits obtain water for domestic use through wells serving single parcels or through small water systems. Locations of wells within 1 mile of the preferred site are indicated at Figure 2-7. Well information extracted from the WSDOE "Well Log Search and View" webpage (http://apps.ecy.wa.gov/welllog/) is listed at Table II-4. This information should be reviewed and updated as the design process continues.

Wetlands

LEGEND

- Incorporated Area
- Wetland
- Open Water
- Wetland Stream
- Highway
- Landmark

Pend Oreille County

Stevens County

Lincoln County

Whitman County

Whitman County

State of Idaho

Camden
Elk
Reflection Lake
Deer Park
Dragoon Lake
Milan
Bear Lake
Mt Spokane
Elev. 5878
Chattaroy
Colbert
Dartford
Mead
Nine Mile Falls
Seven Mile
Newman Lake
Moab
Otis Orchards
Town of Millwood
City of Spokane
City of Spokane Valley
City of Liberty Lake
Shelley Lake
Liberty Lake
Airway Heights
Hite
Deep Creek
Fairchild A.F.B.
Espanola
Medical Lake
Browne's Mountain
Elev. 3144
Mica Peak
Elev. 5225
Marshall
Four Lakes
Mica
Valleyford
Freeman
Cheney
Tyler
Turnbull
Wildlife Refuge
Spangle
Rockford
Fairfield
Waverly
Latah
Rodna
Plaza
Spring Valley
Williams Lake
Knight Lake
Lake Spokane
Horseshoe Lake
Woods Lake
Hog Lake
Fisher Lake
Mason Lake
Amber Lake
Alkali Lake
Badger Lake
Chapman Lake
Phillips Lake
Bonnie Lake
Downs Lake
Frugal Lake
Hedlin Lake
Lonelyville Lake
Clear Lake
Granite Lake
Otter Lake
Ring Lake
Silver Lake
Willow Lake
Meadow Lake
Queen Lake
Fish Lake
Rock Creek
Latah Creek
Pine Creek
Dragoon Creek
Little Spokane River
West Branch Little Spokane River
Spokane River
Deadman Creek
Bloka Lake
#12
#14
#19
#20
#21
#23
#26
#27
#28
#8

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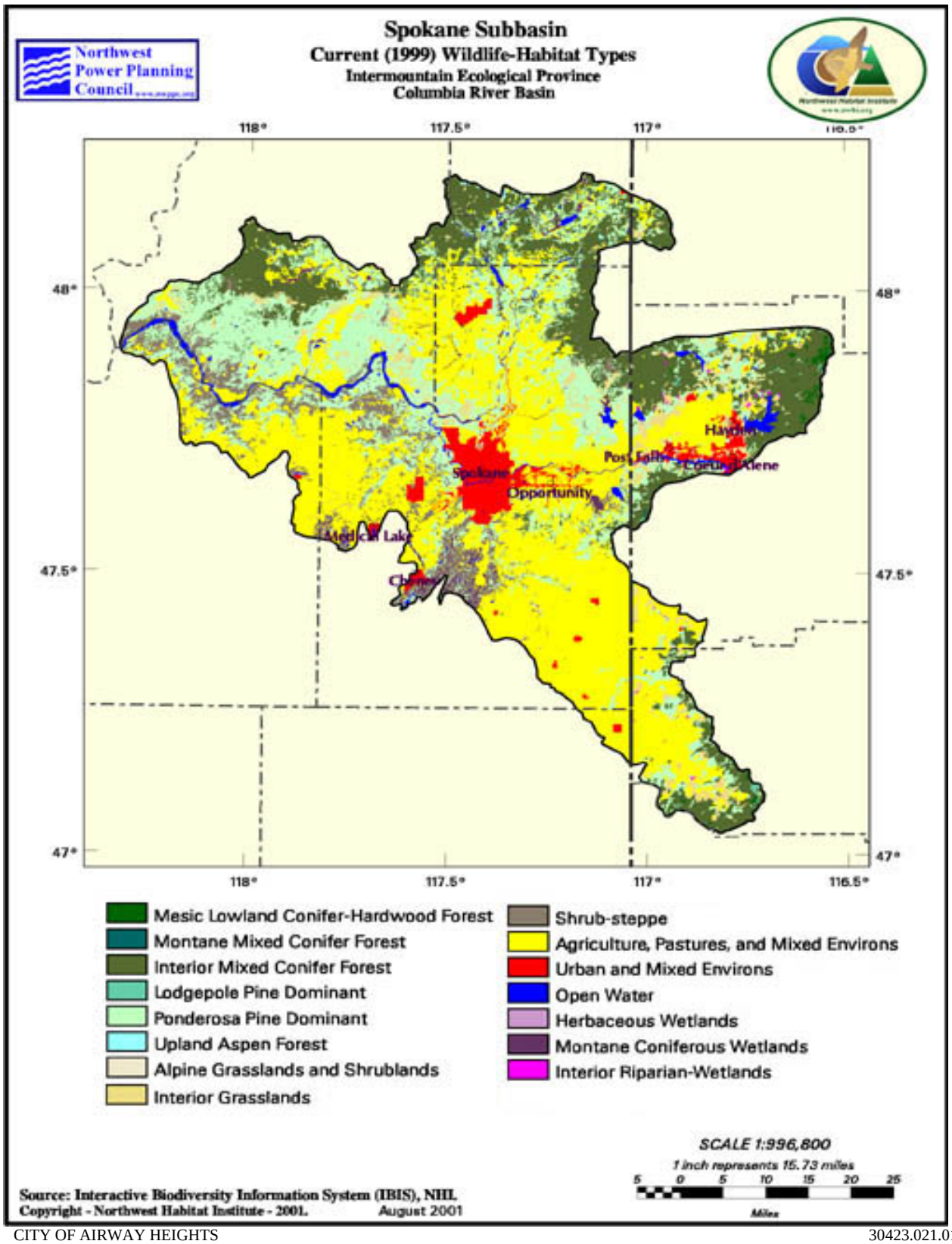
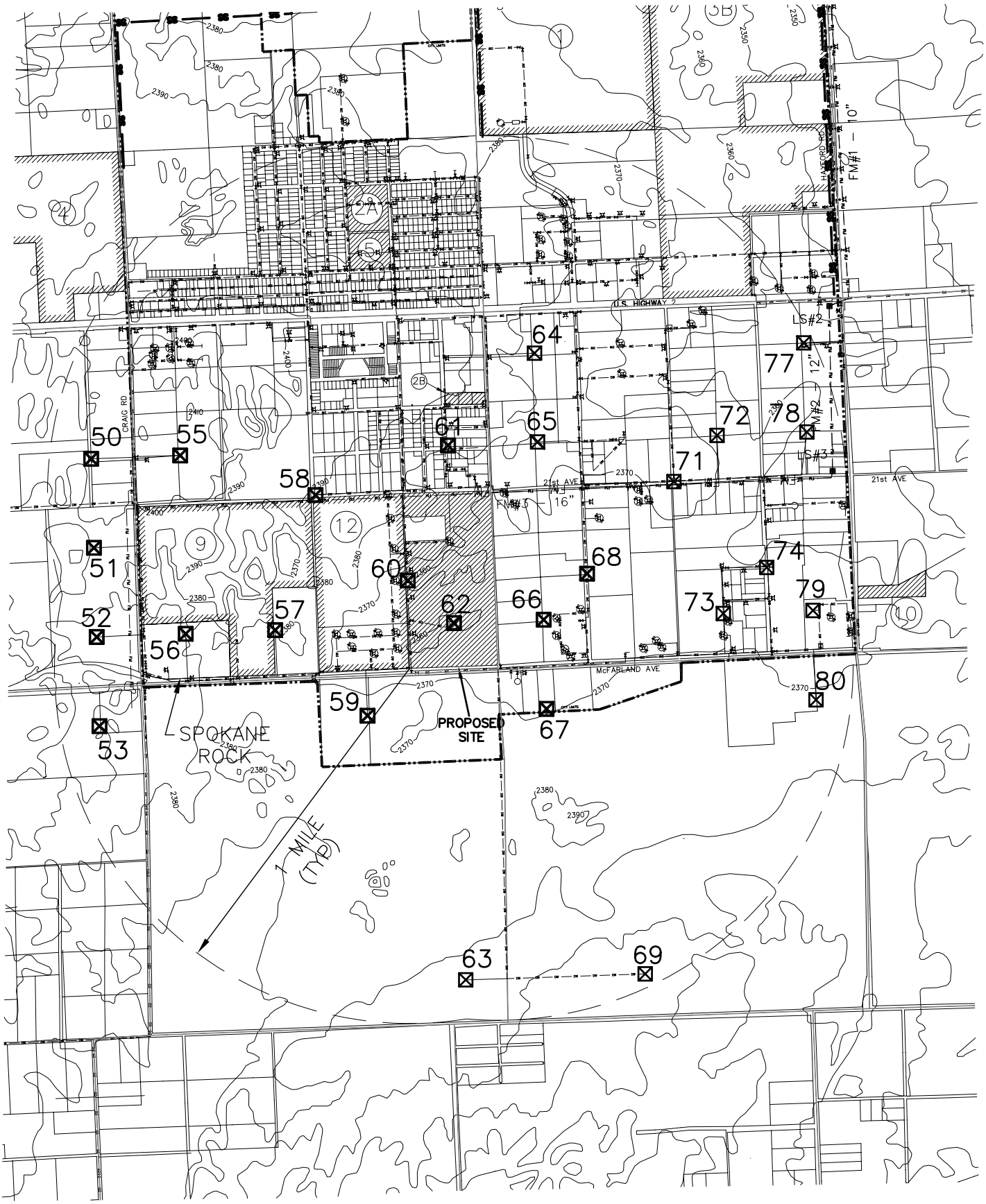
Washington

April 1, 2003
/plan4/cplan/wetlnd1c.aml

Spokane County

Figure 2-6. NHWI Map





DSGND BY: EP	CHCKD BY: EP	**CITY OF AIRWAY HEIGHTS** **FUTURE WELL SERVICES** **PROPOSED SITE**
DRWN BY: WLH	SCALE: NTS	
PROJECT NO: 30423.021.01		

CENTURY WEST
ENGINEERING CORPORATION
1825 N. Hutchinson Rd. 2nd Floor
Spokane, WA 99212
509-838-3810 phone • 509-624-0355 fax

DATE: 10/04/04 | FIGURE: 2–7

Table 2-4. Well information in The Vicinity Of The Preferred Site

well_log_id	well_owner_nm	well type cd	ST PLANE XCOORD NR	ST PLANE YCOORD NR	Map Number	Within 1 mile radius of Site No. 4
184972	RON VIETZKE	W	2713503	853438	50	1
180066	FAIRCHILD AFB	W	2713544	852114	51	1
185103	S. A. I. C. - F. A. F. B.	W	2713585	850789	52	1
175311	MILLWEE HOLLER JR.	W	2713626	849464	53	1
172795	S. A. I. C. - RON VIETZKE	W	2714826	853487	55	1
172834	SCAFCO CORPORATION	W	2714908	850836	56	1
173693	U. S. AIR FORCE	W	2714908	850836	56	1
163138	AMERICAN INDUSTRIAL MFGS	W	2714908	850836	56	1
308261	FAIRCHILD AFB	A	2716238	850890	57	1
294899	FAIRCHILD AFB	R	2716836	852898	58	1
294900	FAIRCHILD AFB	R	2716836	852898	58	1
294901	FAIRCHILD AFB	R	2716836	852898	58	1
294902	FAIRCHILD AFB	R	2716836	852898	58	1
294903	FAIRCHILD AFB	R	2716836	852898	58	1
294904	FAIRCHILD AFB	R	2716836	852898	58	1
294905	FAIRCHILD AFB	R	2716836	852898	58	1
294906	FAIRCHILD AFB	R	2716836	852898	58	1
294907	FAIRCHILD AFB	R	2716836	852898	58	1
294908	FAIRCHILD AFB	R	2716836	852898	58	1
294909	FAIRCHILD AFB	R	2716836	852898	58	1
294910	FAIRCHILD AFB	R	2716836	852898	58	1
172667	ROSS JENSEN	W	2717610	849618	59	1
173607	TOWN OF AIRWAY HEIGHTS	W	2718208	851630	60	1
164473	CITY OF AIRWAY HEIGHTS	W	2718806	853636	61	1
164472	CITY OF AIRWAY HEIGHTS	W	2718894	850995	62	1
294256	TOWN OF AIRWAY HEIGHTS	W	2718894	850995	62	1
168602	JERRY ROBERTS	W	2719069	845692	63	1
167194	GEORGE SIMS	W	2720091	855008	64	1
167750	HELYLET	W	2720137	853688	65	1
165632	DIX CORPORATION	W	2720227	851046	66	1
166990	GARY POWELL	W	2720270	849720	67	1
294108	PETER DIX	W	2720872	851730	68	1
175136	JAMES MATTOCKS	W	2721736	845781	69	1
164235	CASCADE CABLE CONSTRUCTORS	W	2722163	853099	71	1
173333	TERRANCE NILES	W	2722163	853099	71	1
166730	FRANK THALE	W	2722163	853099	71	1
166037	E. SANTISTEVAN	W	2722163	853099	71	1
170723	MICHAEL SCHMIDT	W	2722163	853099	71	1
167953	HUGH JACKMAN, JR.	W	2722163	853099	71	1
172933	SMITH	W	2722163	853099	71	1
170861	MIKE SMITH	W	2722804	853786	72	1
166824	FRED WELK	W	2722897	851138	73	1
349357	TED EASTMAN	W	2723542	851823	74	1
174533	WOODY SCHROEDER	W	2723542	851823	74	1
165215	DAVE LEHNERTZ, LONGHORN BURGERSTOP	W	2724093	855161	77	1

163576	BILL GOFORTH	W	2724139	853836	78	1
166079	E. W. MCCLARIN	W	2724139	853836	78	1
174265	WELK BROS. METAL PARTS	W	2724230	851183	79	1
168185	JACK GILLINGHAM	W	2724274	849854	80	1
166825	FRED WELK	W	2724274	849854	80	1
WELL TYPE CODES						
A	ABANDONED					
R	RESOURCE PROTECTION					
W	WATER					

B. Demography and Land Use

1. Current Population / Equivalent Population

For the purposes of this wastewater facilities plan, current population and land use are expressed in equivalent residential units (ERUs). This approach will allow consistent means of adding population related flows and other land use related flows, and this approach is similar to the City's accounting and fee basis.

There were approximately 1,591 ERUs (Equivalent Residential Units) being served by the City of Airway Heights sewer collection system at the end of 2000. This number included the assessments for commercial and industrial users (135 ERUs), the correctional facility (1,054 ERUs), and single and multi-family residences (402 ERUs). To maintain consistency with the current Sewer Comprehensive Plan, and the City Comprehensive Plan, this number has been used as the base for future growth as further described in Chapter 3.

The City consists of two primary development areas – the area north of SR2, consisting of primarily residential, some commercial sites, and the correctional facility and the area south of SR2, consisting of primarily commercial and industrial sites.

2. Current Land use and Zoning

The projected ultimate densities for each of the seven drainage basins within the City's current service area (Figure 1-5) are tabulated in Table II-5. These ERU densities and basin limits are based on consideration of land uses, topography, and known development plans, as provided in the City's 1995 "Preliminary Design Brief for the South Side Sewer Collection System." Generally, multiplying the area in a given zoning classification by a unit rate of wastewater generation (considered typical for the zoning classification), and dividing that result by the unit rate per ERU led to the ERU densities. Appendix D contains an extract of the calculations from the 1995 Preliminary Design Brief. A copy of the current Zoning Map is provided at Figure 1-6.

Basins N1, S3, and S5 currently connect to the West Plains Interceptor near Highway 2 and Hayford Road. As the system develops, basin S1 could be expected to contribute at this location. Basin S6 and the easterly portion of basin S5 connect to the West Plains Interceptor at 21st Avenue and Hayford Road. The remainder of basin S5 and all of basin S4 are expected to contribute at this location in the future.

As the City expands into the Urban Growth Areas, Basin N1 would expect to receive flows from the northwesterly UGA, and the portion of the westerly UGA situated north of Highway 2. Basin S1 would expect to receive flows from the portion of the westerly UGA situated south of Highway 2.

Note that the total number of ERU's in the current service area at ultimate density is projected to be 23,384 ERUs, compared to the 20-year projection of 6,286 ERU's (year 2030) in Table III-1. This indicates that the entire service area is expected to be developed to approximately 27% of ultimate density at the 20-year design life of the facility.

Table 2-5. Ultimate Density By Drainage Basin
(Current Service Area)

DRAINAGE BASIN NUMBER*	ULTIMATE DENSITY (ESTIMATED ERU'S)**
N1	12,078
S1	602
S2	1,102
S3	4,187
S4	3,852
S5	1,287
S6	275
TOTAL	**23,384**

*Please refer to Sewer Basin Boundary Map, Figure 1-5
** Please refer to Appendix D for calculation of ERU Densities in basins S1 through S6

C. Current Wastewater System Description And Flows

1. Current Wastewater Treatment

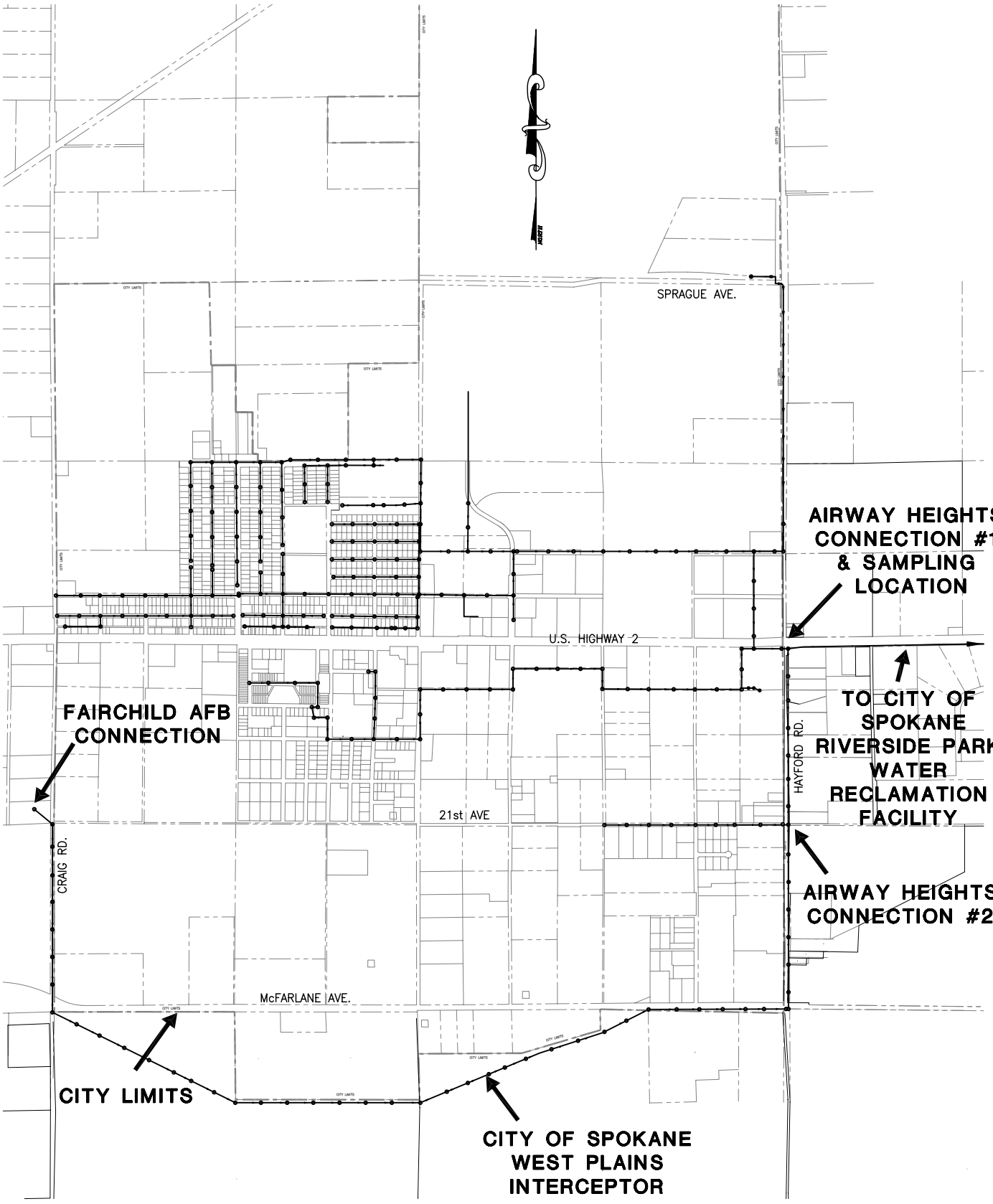
The City of Airway Heights (City) currently discharges wastewater to the West Plains interceptor sewer system of the City of Spokane. The interceptor sewer also collects wastewater from Fairchild Air Force Base (FAFB) and commercial and residential wastewater from the area surrounding the Spokane International Airport. The wastewater proceeds from the West Plains area of Spokane County through Hangman Valley to the Clark Street Lift Station. The Clark Street Lift Station pumps the wastewater to the City of Spokane interceptor sewer leading to the Riverside Park Water Reclamation Facility (RPWRF) (formerly called the Spokane Advanced Wastewater Treatment Plant (SAWTP)). The RPWRF treats the wastewater to remove 5-Day Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and pathogenic bacteria on a year round basis and ammonia nitrogen and total phosphorus (TP) seasonally. The City of Airway Heights Collection System Map (Figure 2-11), shows the layout of the City of Airway Heights Collection System and the location of the Airway Heights and FAFB connection points with the City of Spokane interceptor sewer at Hayford Road and Highway US 2.

Airway Heights, in an agreement with the City of Spokane, has a reserved discharge of up to 680,000 gallons per day. Of this amount, 400,000 gallons per day was initially allocated to the Airway Heights Correction Center. As noted in Chapter 7, the Department of Corrections recently transferred 15,000 gallons per day of DOC's allotted capacity to the City of Airway Heights. Fairchild Air Force Base has an agreement with the City of Spokane for discharge of up to one million gallons per day of wastewater to the West Plains interceptor sewer system.

2. Flow and Loading Data

Historical data from City of Spokane monitoring of the Airway Heights and FAFB discharges has been obtained and reviewed. Figure 2-9 shows the monthly average wastewater flow from Airway Heights and FAFB to the City of Spokane interceptor sewer from 1999 through 2003. The City of Spokane obtained the flow data as part of its pretreatment program. The calibration of the flowmeters is the responsibility of the City of Spokane.

Prior to September 2000, the Airway Heights flow data includes data from the main connection to the interceptor only. From September 2000 through December 2003, the average flow from the Airway Heights interceptor connection No. 2 was approximately 500 GPD. The maximum month flow was approximately 2,300 GPD. The flow measurement at interceptor connection No. 2 appears to be quite variable, which may be due to a flow meter that is operating at the low end of its range. To date, the average monthly flow from Airway Heights has not exceeded its 0.68 MGD agreement with the City of Spokane. Flow from FAFB has apparently exceeded its 1.0 MGD agreement with the City of Spokane, although the agreement may be subject to interpretation regarding maximum flows resulting from infiltration and/or inflow.



DSGND BY:	CHCKD BY: EP	CITY OF AIRWAY HEIGHTS SEWER COLLECTION SYSTEM MAP	CENTURY WEST ENGINEERING CORPORATION
DRWN BY: WLH	SCALE: N.T.S.		
PROJECT NO: 30423.021.01			DATE: 10/04/04 | FIGURE: 2-8

Summaries of the analytical data for composite wastewater samples collected by the City of Spokane at the Airway Heights and FAFB connection points with the City of Spokane interceptor sewer from 1999 through 2003 are included in Table 2-6 and Table 2-7. The locations of the sampling points are shown in Figure 2-8, City of Airway Heights Collection System Map. The composite samples were analyzed for BOD, TSS, and TP at the City of Spokane RPWRF Laboratory. The laboratory is certified for testing of these parameters in accordance with WAC 173-50, Accreditation of Environmental Laboratories. The wastewater loads of these parameters were calculated from the concentration of each parameter and average monthly flow when the sample was collected.

In addition, Century West Engineering performed sampling of the connection point for Airway Heights to the Spokane interceptor on May 2, 2002, for preparation of the City of Airway Heights Comprehensive Sewer Plan (Century West Engineering, April 2003). The sampling was performed for verification of City of Spokane testing as well as to test for other parameters (i.e., total nitrogen (TN)) previously not included in the City of Spokane testing. Since only one data point for TN was obtained from this sampling effort, it is recommended that the City of Airway Heights sample its own wastewater discharge as well as the wastewater discharges from FAFB and Airway Heights Correctional Center for BOD, TSS, TP, and TN for a minimum of one-year on a monthly basis. The relative magnitude and proportion of each of these constituents in the wastewater are important in determining the overall cost and the cost allocation for the various users of a proposed wastewater treatment and reclamation facility.

Figure 2-9. Wastewater Flow, Airway Heights and Fairchild AFB, 1999-2003

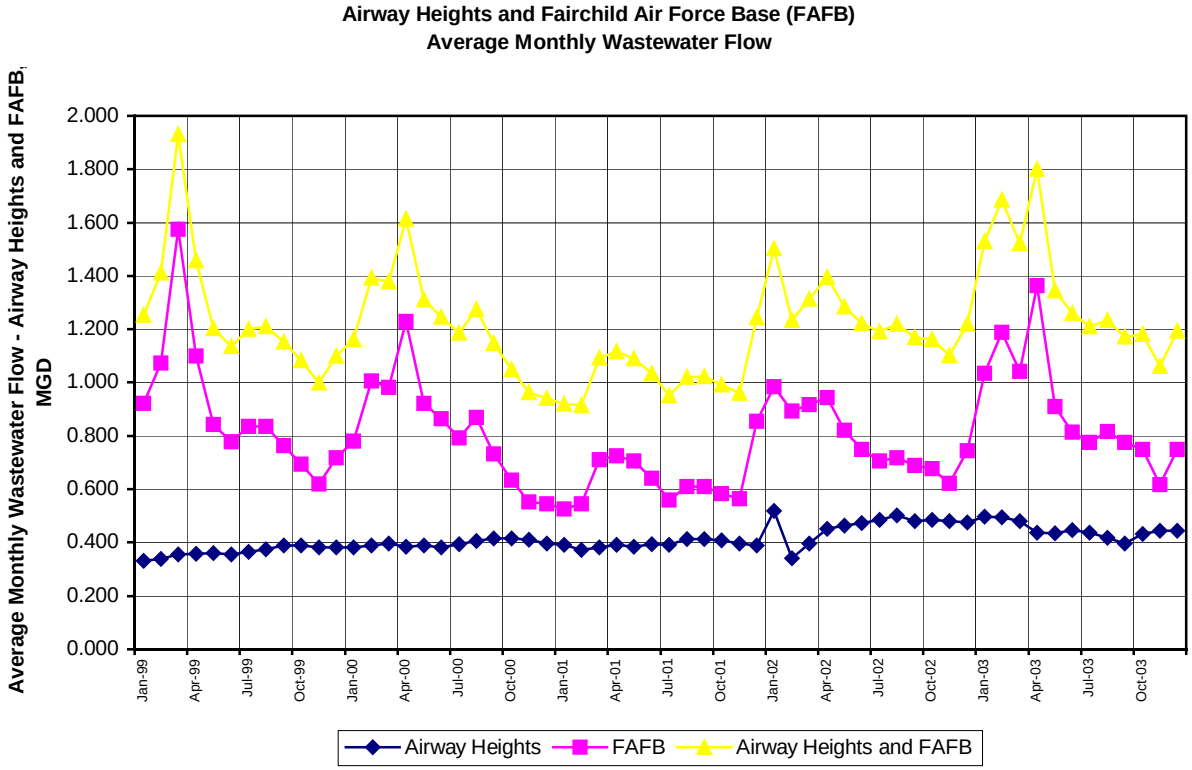


Table 2-6. Airway Heights Data Summary, Wastewater Flow and Load, 1999-2003						
Parameter	No. Points[a]	Mean	Standard Deviation	Maximum	Minimum	Mean + 1 Standard Deviation
Flow, Mo. Avg., MGD	48	0.405	0.042	0.495	0.341	0.448
BOD, mg/L	23	268	103	505	91	371
BOD, PPD	23	919	396	1783	301	1315
TSS, mg/L	24	242	101	520	51	343
TSS, PPD	24	825	355	1546	164	1180
P, mg/L	24	6.56	1.49	10.05	4.31	8.05
P, PPD	24	22.4	6.3	34.2	12.8	28.7

Notes: a. Number of data points during sampling by City of Spokane. Data is from City of Spokane.

Table 2-7. Fairchild AFB Data Summary, Wastewater Flow and Load, 1999-2003						
Parameter	No. Points[a]	Mean	Standard Deviation	Maximum	Minimum	Mean + 1 Standard Deviation
Flow, Mo. Avg., MGD	48	0.822	0.229	1.576	0.536	1.051
BOD, mg/L	24	119	70	296	39	189
BOD, PPD	24	788	469	2321	357	1257
TSS, mg/L	24	123	95	458	38	218
TSS, PPD	24	826	677	3477	170	1503
P, mg/L	24	4.11	1.68	8.97	1.74	5.79
P, PPD	24	27.0	11.3	68.1	17.2	38.3

Notes: a. Number of data points during sampling by City of Spokane. Data is from City of Spokane.

3. Sources of Wastewater

a. Commercial and Industrial Sources

Within the area zoned for heavy and light industrial uses, there are currently no facilities producing industrial wastewater. The water discharged by the industrial customers connected to the City of Airway Heights collection system is of municipal in nature and does not require pretreatment or State Waste Discharge Permitting. Water usage by all users appears to increase two- to three-fold during the summer months (July through September) primarily due to landscape irrigation and aggregate washing, which do not significantly contribute to the wastewater discharge volumes.

Currently, the City has commercial- and industrial-zoned land available for development. Several commercial and industrial developments such as Hawkins Edwards, Summit Development Business Park, and Central Pre-Mix are currently in various stages of design. The Summit Development Business Park is currently under construction. Pretreatment requirements are addressed on a parcel-by-parcel basis. A Pizza Hut restaurant recently opened in this development, and a grease interceptor was required for wastewater pretreatment. Hawkins Edwards has completed development of a Cyrus O'Leary's food processing center that will require approximately 100,000 gallons per month of water consumption. The City required a grease interceptor for wastewater pretreatment on that project.

Based on the ratio of estimated commercial and industrial Equivalent Residential Units (ERUs) (135) to the total ERUs (1,591) served by the City's sewer collection system at the end of 2000, the portion of commercial and industrial wastewater discharged to the City's collection system is 8.5 percent.

b. Institutional Sources

The only "institutional source" currently discharging to the City's sewer collection system is the Airway Heights Corrections Center. The portion of institutional wastewater discharged to the City's collection system is 66.2 percent, based on the ratio of the estimated institutional ERUs (1,054) to the total ERUs (1,591) served by the City' sewer collection system at the end of 2000.

c. Residential Sources

The portion of residential wastewater discharged to the City's collection system is 25 percent, based on the ratio of the single and multi-family residences (402 ERUs) to the total ERUs (1,591) served by the City' sewer collection system at the end of 2000.

4. Seasonal Loading Variations

Flow from the City of Airway Heights appears to be very consistent. Based on the flow data presented in Figure 2-11, the magnitude of difference between the minimum and maximum month flows and the average annual flow in a given year is estimated to be 6.4 percent or less for the minimum month flow (typically February) and 3.2 percent or less for the maximum month flow (typically October).

Flow from FAFB is more variable and appears to be highest during wet months during years with high precipitation. This could be an indication of infiltration and/or inflow to the sewer system. Based on the flow data presented in Figure 2-11, the magnitude of difference between the minimum and maximum month flows and the average annual flow in a given year is estimated to be 26 percent or less for the minimum month flow (typically November) and 32 percent or less for the maximum month flow (typically April).

The wastewater loads calculated from the sampling measurements appear to be more variable than the flows. This could indicate that sampler tubes may have been indiscriminately placed and segregated during the wastewater sampling (i.e., a sample tube placement on the bottom of the channel would pick up solids preferentially). Based on the analytical data summarized in Table 2-6 for the City of Airway Heights, the magnitude of difference between the minimum and maximum seasonal BOD loading and the average annual BOD loading in a given year is estimated to be 18 percent or less for the minimum seasonal BOD loading (typically March through May) and 28 percent or less for the maximum seasonal BOD loading (typically in September through December). The magnitude of difference between the minimum and maximum seasonal TSS loading and the average annual TSS loading in a given year is estimated to be 10 percent or less for the minimum seasonal TSS loading (typically February through May) and 14 percent or less for the maximum seasonal TSS loading (typically in July through September).

Based on the analytical data summarized in Table 2-7 for FAFB, the magnitude of difference between the minimum and maximum seasonal BOD loading and the average annual BOD loading in a given year is estimated to be 35 percent or less for the minimum seasonal BOD loading (typically November through March) and 41 percent or less for the maximum seasonal BOD loading (typically in April and May). The magnitude of difference between the minimum and maximum seasonal TSS loading and the average annual TSS loading in a given year is estimated to be 31 percent or less for the minimum seasonal TSS loading (typically November through March) and 48 percent or less for the maximum seasonal TSS loading (typically in April and May).

The variation in BOD and TSS loading from the City of Airway Heights does not appear to correlate with variation in wastewater flow, whereas, for FAFB, the variation in BOD and TSS loading does appears to correlate with variation in wastewater flow. However, because of the significant variation in the data values from year-to-year for the same months and seasons, the data provides only a rough approximation at best of the seasonal loading variations.

D. Inflow and Infiltration

Infiltration and inflow, in the context of sewage collection systems, refers to extraneous undesirable flows that enter the collection system from a variety of sources. Infiltration generally means flows that enter the system from groundwater sources through leaky pipe and manhole joints, or damaged pipe. Inflow refers to stormwater entering the system through manhole lids, through illegal storm drain or roof drain connections, or similar sources.

Infiltration/inflow in some sewage collection systems presents a major problem. Wet weather flows can far exceed the capacity of the collection and treatment system, resulting in sewage backups in homes and raw sewage bypasses of treatment facilities.

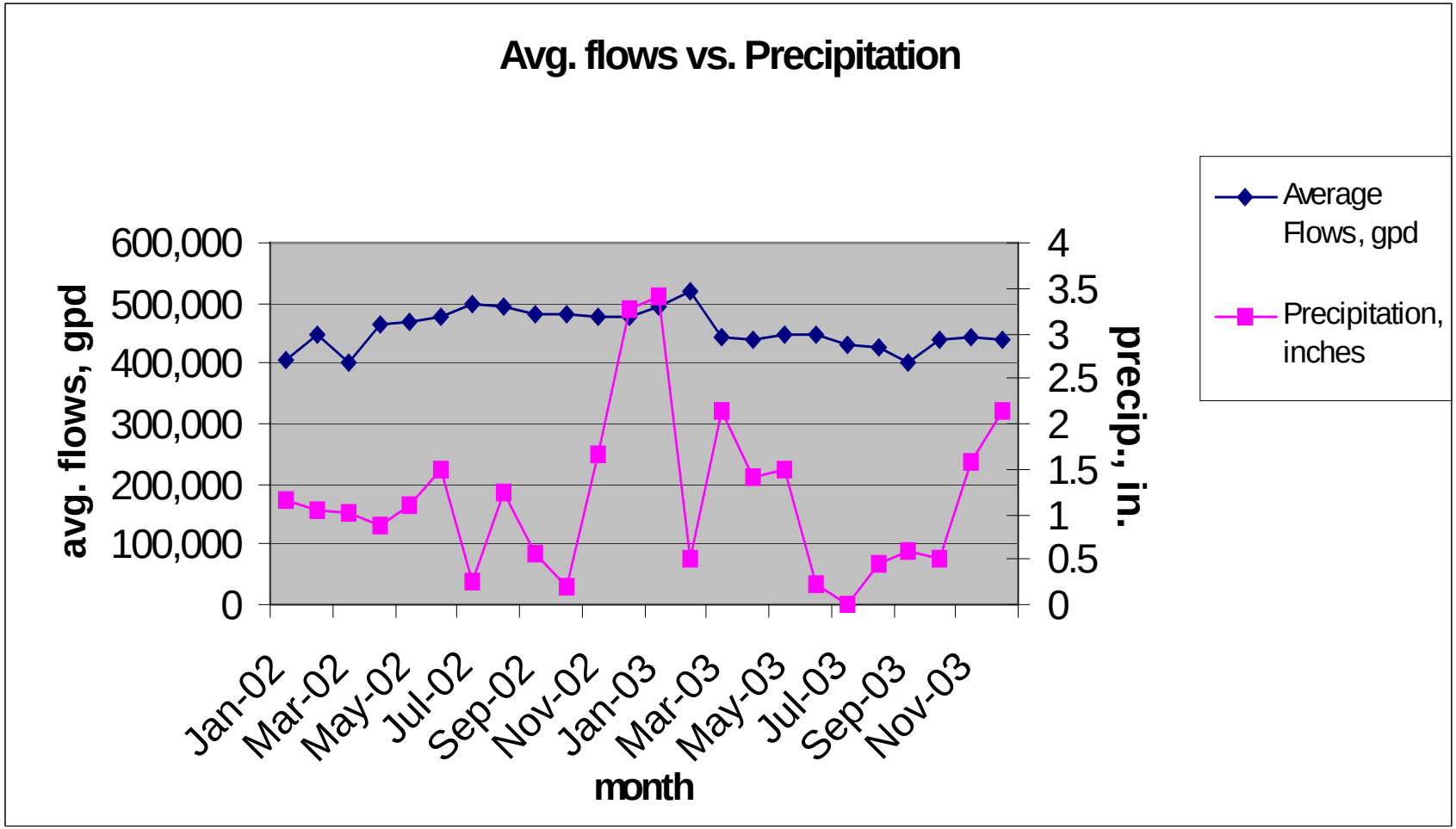
The City of Airway Heights' collection system, overall, is in good to very good condition. The system is less than ten years old, and has been constructed with materials of high quality. Groundwater levels are generally below the gravity sewer lines, decreasing the probability of infiltration problems.

The flows measured at the flow-monitoring stations do not exhibit a pronounced increase during periods of wet weather. Flows, therefore, indicate that the system as a whole does not have a significant infiltration/inflow problem. Table 2-8 presents monthly sewer production, average daily flows, and monthly precipitation figures. The data is presented graphically in Figure 2-10. The data in this table shows no observable correlation between rainfall and measured sewer flows.

Table 2-8. Precipitation vs. Sewer Production

Month	Monthly Rainfall (Inches)	Monthly Sewer Production (gallons)	Average Daily Flow (gpd)
Jan-02	1.15	12,523,723	403,991
Feb-02	1.04	12,578,075	449,217
Mar-02	1.02	12,463,601	402,052
Apr-02	0.88	13,967,554	465,585
May-02	1.1	14,483,137	467,198
Jun-02	1.5	14,262,293	475,410
Jul-02	0.25	15,406,358	496,979
Aug-02	1.24	15,289,269	493,202
Sep-02	0.55	14,394,845	479,828
Oct-02	0.19	14,996,529	483,759
Nov-02	1.65	14,319,120	477,304
Dec-02	3.27	14,806,558	477,631
Jan-03	3.4	15,383,071	496,228
Feb-03	0.52	14,539,509	519,268
Mar-03	2.13	13,736,038	443,098
Apr-03	1.41	13,150,117	438,337
May-03	1.49	13,889,806	448,058
Jun-03	0.22	13,421,695	447,390
Jul-03	0	13,364,203	431,103
Aug-03	0.44	13,291,285	428,751
Sep-03	0.58	12,034,502	401,150
Oct-03	0.51	13,559,106	437,391
Nov-03	1.57	13,321,245	444,041
Dec-03	2.14	13,622,395	439,432

Figure 2-10. Average Flows vs Precipitation



1. Sewer Overflows

The City of Airway Heights discharges wastewater into a conveyance and reclamation system owned and operated by the City of Spokane. There are no known overflows from the wastewater conveyance system owned and operated by the City of Airway Heights.

2. Combined Sewer Overflows

The City of Airway Heights discharges wastewater into a conveyance and reclamation system owned and operated by the City of Spokane. There are apparently several storm drainage sources connected to the West Plains Interceptor (designated as I08 in the City of Spokane system), which conveys flows to the Clark Street Lift Station. There are also several storm drainage sources connected to the conveyance line (I02) between the Clark Street Lift Station and the RPWRF.

Within the City of Airway Heights, City of Airway Heights Municipal Code (CAHMC) Section 13.06.860 (Appendix B.2) prohibits the connection of storm drainage systems to the sanitary sewer system. As part of the development project approval process, the City of Airway Heights reviews development plans to ensure that storm drainage systems are not designed to connect to the sanitary sewer system. The City also inspects construction of sanitary sewer and storm drainage systems for development projects as well as for single buildings to ensure that these systems are not connected. There are no known combined sewer overflows from the wastewater conveyance system owned and operated by the City of Airway Heights.

3. Approved CSO Report

The City of Spokane identified CSO issues in its November 1994 "CSO Reduction Plan". Spokane's 1999 Wastewater Facilities Plan also addresses CSO issues. The City of Spokane is in the process of developing alternatives for resolving CSO problems.

E. Unsewered Communities

The City of Airway Heights does not currently serve any unsewered areas outside the City's service area. However, there are areas within the City's service area that are not yet connected to the sewer system. The portions of the City currently served by sewer are illustrated at Figure 1-4.

The City has focused the majority of its Septic Tank Elimination Program efforts in the area north of SR2, as that area contains a high density of residential sources, and that area has exhibited the highest growth. As new residential and commercial developments occur, connection to the City sewer system is required. City road and water projects incorporate the extension of public sewer as part of the utility scope of work, where such extensions are economically feasible. This coordination minimizes situations where a newly repaved road is cut and patched for utility installation a few years later.

As sewers are extended, other parcels are required to connect to the system if the extension results in a public sewer located within 200 feet of the parcel boundary. Parcels within this distance that have not connected are assessed a "sewer availability" charge. The City's Policy to Limit On-Site Sewage

Disposal Systems is found in Section 13.06.780 of the City of Airway Heights Municipal Code (Appendix B.3).

The zoning limitations imposed by the FAFB APZ have hampered sewer system extension in the area south of SR2. All but low-density industrial uses are effectively barred, and projects that might lead to increased density on existing parcels with vested development rights (such as sewer extensions) are not generally cost-effective.

In addition, a considerable number of mobile home rental units are present in this portion of town, and many of these units are served by on-site community septic systems. Legislative exemptions hamper the City's efforts to require connection of mobile homes when public sewer is located within 200' of the property.

The City's efforts to obtain funding targeted for low-income areas have also been impeded by funding program rules which consider the income level of the property owner, instead of that of the property occupant, in determining eligibility.

1. Health Emergency

Currently, there is no state of health emergency in the City of Airway Heights connected with failure of on-site septic systems.

2. Sanitary Survey Conducted

Sanitary surveys are required where on-site septic drainfields are involved. The Washington State Department of Health typically conducts sanitary surveys every 5 years for Class A water systems.

There are numerous septic drainfields remaining in the City of Airway Heights' Service Area. A Sanitary Survey was last conducted in October 2003.

3. Total On-Site Systems/# of Failures (Commercial/Industrial/Residential)

City ERU growth projections (Table III-1) indicate a potential for approximately 580 on-site systems to be connected to the public sewer system. City utility records indicate that there are 147 on-site systems currently within a reasonable distance of an existing sewer line ("availability" distance, currently defined as 200 feet) which are pending connection to the public sewer system. Of these, 134 accounts are residential, and 17 accounts are commercial. The City records do not readily provide a breakdown of the commercial accounts into ERUs. The Spokane County Regional Health District (SCHRD) tracks on-site septic systems in the City of Airway Heights. SCHRD records indicate that there are 414 on-site septic systems in the City of Airway Heights as of August 2004; of these, 57 have experienced failures or have had some sort of repair. The SCHRD records system currently does not provide a tabulation of the number of failures by type of failure.

The City's customer records for July 2004 indicate a total of 825 customers for water service within the City's service area. The customer records for August 2004 indicate a total of 471 customer accounts for sewer service (excluding "availability" accounts). It should be noted that some of the commercial accounts (such as for the DOC, Microtel, apartment buildings, mobile home parks, etc.) represent multiple ERUs. A copy of recent "Water Use by Class" and "Sewer Use by Class" summaries are included at Appendix E.

4. Health Department Involvement

Spokane County Regional Health District (SCRHD) notes that health emergencies have been declared in certain locations in the past in connection with mobile home parks south of SR2, resulting in repairs to failed systems.

5. Failure Modes

The Spokane County Regional Health District notes that on-site septic system failures have occurred generally at the mobile home parks in the south part of the City. Failures are primarily related to the very shallow soils (bedrock can occur within 4 feet of the surface), overuse, and limited room on the small lots for a system without a level of redundancy appropriate for the conditions. SCRHD notes that in some instances, 2 or 3 residential units are connected to a single on-site system. Small parcel sizes tend to hamper design and installation of replacements for failed systems.