**Population Distribution
in 90 Mile Radius of Hanford
Meteorological Station and
Projections to Year 2300 by
Compass Sector and 10 Mile
Radii**

**Prepared for Atlantic Richfield Hanford
Company, Richland, Washington 99352**

Keith E. Yandon

December 1976

**Prepared for the Energy Research
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POPULATION DISTRIBUTION IN 90 MILE RADIUS
OF HANFORD METEOROLOGICAL STATION AND
PROJECTIONS TO YEAR 2300 BY COMPASS
SECTOR AND 10 MILE RADII

Prepared for Atlantic Richfield Hanford Company
Richland, Washington 99352

Keith E. Yandon, Project Director

December 1976

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Pacific Northwest Laboratories
Richland, Washington 99352

FOREWORD

Population distributions and projections around specific project sites are usual prerequisites to energy-related construction license applications. Population information presented here was developed in response to a request by Atlantic Richfield Hanford Company. It will be used in conjunction with technical and environmental evaluations presently being conducted on alternatives for long-term management of Hanford defense high-level waste. Projected facilities would be sited within a few miles of the Hanford Meteorological Station. Typically, the population measurements such as these are usually expressed in terms of the 16 compass sectors and in varying 10 mile radii for specific decades to the year 2000 out to a radius of 50 miles. For this current assignment, however, the time period is extended to the year 2300 and the radius extended in 10 mile intervals to 90 miles.

Because of extensive experience in economic impact analysis plus long-time working familiarity with Mid-Columbia and Hanford related economic and population developments, Battelle-Northwest was invited to conduct this research. In the opinion of the study team selected for this work, these population findings and the back up information by which they were developed are most reasonable and can be statistically supported.

For reader convenience the presentation is separated into three major areas:

1. Highlights of total area population distributions and trends for 1970-2300 with supporting summary tables presenting separate radii and compass sector totals and diagrams of detailed population distributions by the 16 compass sectors and nine 10 mile radii sectors out to 90 miles for the 14 selected yearly periods. Compass section totals for the 50 mile radius are also summarized.
2. Analyses and summary table of population distribution down river from the project site approximately 10 miles on each side of the Columbia River to a point just east of the City of Dalles, Oregon.
3. Description of assumptions utilized and detail of population projection techniques along with the identification of informational sources utilized.

SUMMARY

Total population in the 90 mile study area identified by the map in Figure 1 was estimated to be 446,000 in 1970. By 1980 the area population was expected to be about 468,000, an increase of more than 5% over 1970 levels. Between 1980 and the year 2000 another 52,000 persons were expected to be residing within the study area, an increase of nearly 12%. The year 2000 total will be in the neighborhood of 520,000. Our high estimate for 2300 indicates a study area population of 774,000 with the low estimate at 593,209, the same as presented for the 2020 decade.

Table 1 presents an estimate of total population living within each of the 16 compass sectors for these decades. Table 2 presents similar data for the standard 50 mile radius. Table 3 presents summary estimates of total population (in terms of persons) residing within each of the 9 radii for the same decades.

Diagrams 1-14 present population distribution around the Hanford Meteorological Station (HMS) by compass sector and 10 mile radii for various decades between 1970 and 2300. Sixteen compass sectors and nine 10 mile radii intervals extending 90 miles are covered in this distribution.

Population growth rates generally will tend to lessen between the years 2000 and 2020. By the year 2020 the area's population will be holding at some 593,000. One U.S. Census Bureau⁽¹⁾ estimates of national population series expects that the highest average annual population growth rate will be approximately 0.2% from 2030 to 2050. Another population forecast from this same source is based on a low growth rate of 0% indicating that nationally population will be leveling out from 2020 onward.

Assuming that the high estimate, the 0.2% average annual growth, is realistic, such a rate would produce a total study area population of about 774,000 by the year 2300. The lower growth rate, 0%, would result in a year 2300 population of only 593,000 where it is in fact a continuation of the 2020 level. These assumptions for these projections and the specific sources for the assumed growth rates for all periods are described in the Appendix.

The highest population densities will continue to be concentrated within the 20-40 mile radii in the southeast compass sectors. This high density area includes the Tri-City area which appears to have the highest economic potential of all cities in the study area.

Rural areas will show little population change except for those directly involved in irrigation-related developments such as the Second Bacon Siphon and Tunnel, Horse Heaven Hills Development, and activities in the Umatilla-Boardman area. Populations relating to these irrigation developments have been accounted for in these diagrams and tables. Further explanation of their handling is covered in the Appendix.

Since each compass-radii sector is a separate entity, their comparative growth rates and trends vary both between sectors as well as from the area total. Depending on their separate economic influences, some are growing faster or slower than others with the summarized totals representing the composite for the 90 mile radius as a whole. Differences in sector population growth become very apparent upon comparison of separate sector totals within the 14 separate decade forecasts.

TABLE 1. Summary of HMS* Population Distribution
by Total of Compass Sector and Year (90 Mile Radius)

Compass Sector	1970	1980	1990	2000	2010	2020	2040	2060	2080	2100	2150	2200	2250	2300
TOTAL	446,412	467,882	497,605	520,292	556,755	593,209	608,643	620,876	633,271	645,582	677,620	709,659	741,676	773,719
North	12,689	13,100	13,555	14,004	15,020	16,036	16,325	16,614	16,903	17,192	17,912	18,634	19,355	20,076
North-Northeast	19,768	21,024	22,468	23,894	24,084	24,274	24,847	25,339	25,993	26,566	27,994	29,427	30,830	32,233
Northeast	13,559	14,495	15,672	16,815	17,927	19,044	19,418	19,792	20,166	20,537	21,472	22,407	23,342	24,277
East-Northeast	6,886	7,492	8,713	9,919	10,281	10,643	10,768	10,893	11,018	11,143	11,455	11,760	12,079	12,391
East	3,279	3,389	3,616	3,802	3,826	3,865	3,885	3,905	3,925	3,945	3,994	4,043	4,092	4,141
East-Southeast	44,307	45,756	47,287	48,135	52,858	57,581	59,035	60,489	61,943	63,397	67,032	70,667	74,302	77,933
Southeast	78,716	83,989	91,829	99,247	108,110	116,973	119,666	122,359	125,052	127,745	134,475	141,206	147,934	154,665
South-Southeast	32,064	35,209	40,680	42,919	46,014	49,119	50,074	51,029	51,984	52,939	55,326	57,713	60,100	62,487
South	7,936	8,852	9,949	10,631	10,918	11,205	11,293	11,381	11,469	11,557	11,778	11,999	12,220	12,441
South-Southwest	10,912	11,713	12,900	13,999	14,175	14,351	14,408	14,465	14,522	14,579	14,723	14,867	15,011	15,155
Southwest	21,781	23,189	24,860	25,879	28,000	30,121	31,488	32,192	32,896	33,600	35,361	37,122	38,888	40,644
West-Southwest	25,137	25,289	25,626	26,363	27,280	28,167	28,535	28,903	29,271	29,639	30,559	31,479	32,392	33,319
West	88,291	89,062	90,994	92,917	100,956	108,995	111,674	114,353	117,032	119,711	126,411	133,111	139,811	146,511
West-Northwest	6,668	6,748	6,870	6,962	7,042	7,122	7,149	7,176	7,203	7,230	7,297	7,364	7,431	7,498
Northwest	27,192	27,682	28,164	28,444	30,834	33,224	36,432	37,183	37,934	38,685	41,817	44,949	48,081	51,243
North-Northwest	47,227	50,893	54,422	56,371	59,430	62,489	63,646	64,803	65,960	67,117	70,014	72,911	75,808	78,705

*Hanford Meteorological Station

TABLE 2. Summary of HMS* Population Distribution by Total
of Compass Sector and Year (50 Mile Radius)

Compass Sector	1970	1980	1990	2000	2010	2020	2040	2060	2080	2100	2150	2200	2250	2300
TOTAL	246,474	256,564	273,143	289,739	310,091	330,434	337,674	344,833	352,154	359,391	377,492	395,598	413,697	431,840
North	3,925	4,216	4,551	4,886	4,975	5,064	5,089	5,114	5,139	5,164	5,227	5,290	5,353	5,416
North-Northeast	16,269	17,474	18,867	20,260	20,260	20,260	20,779	21,217	21,817	22,336	23,628	24,925	26,222	27,519
Northeast	8,283	9,157	10,271	11,386	12,017	12,653	12,889	13,125	13,361	13,594	14,185	14,776	15,367	15,958
East-Northeast	3,864	4,442	5,634	6,826	7,057	7,288	7,358	7,428	7,498	7,568	7,743	7,918	8,093	8,268
East	1,797	1,925	2,170	2,365	2,389	2,428	2,439	2,450	2,461	2,472	2,500	2,528	2,556	2,584
East-Southeast	1,909	2,018	2,209	2,398	2,398	2,398	2,398	2,398	2,398	2,398	2,398	2,398	2,398	2,398
Southeast	63,668	68,029	75,024	82,020	90,183	98,356	100,808	103,260	105,712	108,164	114,294	120,424	126,554	132,684
South-Southeast	4,534	4,835	5,512	5,855	6,219	6,584	6,696	6,808	6,920	7,032	7,312	7,592	7,872	8,152
South	2,696	2,879	3,179	3,479	3,479	3,479	3,479	3,479	3,479	3,479	3,479	3,479	3,479	3,479
South-Southwest	9,074	9,700	10,712	11,723	11,850	11,977	12,019	12,061	12,103	12,145	12,251	12,357	12,463	12,569
Southwest	15,988	16,093	16,461	16,828	18,556	20,284	20,860	21,436	22,012	22,588	24,028	25,468	26,908	28,348
West-Southwest	23,323	23,475	23,812	24,549	25,466	26,353	26,721	27,089	27,457	27,825	28,745	29,665	30,578	31,505
West	82,403	83,156	85,070	86,984	94,966	102,948	105,608	108,268	110,928	113,588	120,240	126,892	133,544	140,196
West-Northwest	2,551	2,566	2,623	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682
Northwest	1,820	1,905	1,982	2,060	2,151	2,242	2,272	2,302	2,332	2,362	2,438	2,514	2,580	2,696
North-Northwest	4,370	4,694	5,066	5,438	5,438	5,438	5,577	5,696	5,855	5,994	6,342	6,690	7,038	7,386

*Hanford Meteorological Station

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TABLE 3. Summary of HMS* Population Distribution
by Total of Radii Sector by Year

Radii Distance	1970	1980	1990	2000	2010	2020	2040	2060	2080	2100	2150	2200	2250	2300
0 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 - 20	5,842	6,110	6,584	7,070	7,227	7,385	7,438	7,491	7,544	7,597	7,729	7,861	7,993	8,125
20 - 30	64,959	68,530	74,835	81,537	88,347	95,177	97,795	100,332	103,031	105,646	112,190	118,739	125,288	131,837
30 - 40	63,980	67,493	72,774	78,050	83,896	89,712	91,641	93,570	95,499	97,428	102,250	107,072	111,894	116,716
40 - 50	111,693	114,431	118,950	123,082	130,621	138,160	140,800	143,440	146,080	148,720	155,323	161,926	168,522	175,162
50 - 60	47,969	49,787	53,669	55,149	58,865	62,581	66,164	67,290	68,416	69,542	72,351	75,162	77,972	80,782
60 - 70	96,391	103,473	110,321	113,730	123,144	132,558	135,521	138,484	141,447	144,410	151,819	159,229	166,637	174,042
70 - 80	36,868	38,825	40,715	41,648	44,004	46,360	47,135	47,910	48,685	49,460	52,655	55,850	59,044	62,240
80 - 90	18,710	19,233	19,757	20,026	20,651	21,276	22,149	22,359	22,569	22,779	23,303	23,820	24,326	24,815
90 MILE RADIUS TOTAL	446,412	467,882	497,605	520,292	556,755	593,209	608,643	620,876	633,271	645,582	677,£20	709,659	741,676	773,719
50 MILE RADIUS TOTAL	246,474	256,564	273,143	289,739	310,091	330,434	337,674	344,833	352,154	359,391	377,492	395,598	413,697	431,840

*Hanford Meteorological Station

DIAGRAM 1

ESTIMATE OF 1970 POPULATION DISTRIBUTION WITHIN 90 MILES
OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

DIAGRAM 2

PROJECTION OF 1980 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

DIAGRAM 3

PROJECTION OF 1990 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

DIAGRAM 4

PROJECTION OF 2000 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

DIAGRAM 5

PROJECTION OF 2010 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

DIAGRAM 6

PROJECTION OF 2020 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

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DIAGRAM 7

PROJECTION OF 2040 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

Note: The 2040 projection will be the low estimate for all years through 2300 if the assumed zero growth rate is operative.

DIAGRAM 8

PROJECTION OF 2060 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DIAGRAM 9

PROJECTION OF 2080 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DIAGRAM 10

PROJECTION OF 2100 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DIAGRAM 11

PROJECTION OF 2150 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

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DIAGRAM 12

PROJECTION OF 2200 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DIAGRAM 13

PROJECTION OF 2250 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DIAGRAM 14

PROJECTION OF 2300 POPULATION DISTRIBUTION WITHIN
90 MILES OF HMS* BY 16 COMPASS SECTORS AND 10 MILE RADII

*Hanford Meteorological Station

NOTE: The projections on diagrams 8-14 represent the high series based on the U.S. average annual growth rate of 0.2%.

DOWN RIVER POPULATIONS

Population residing in close proximity to downstream Columbia River - a 160 mile long and 20 mile wide area - approximated 79,365 in 1970 and was projected to rise to a high of 172,548 by the year 2300. The apparent 117% increase in river oriented population over the 330 years is some 41% points higher than the 75% increase projected for the 180 mile wide total study area. It is furthermore projected that approximately 75-77% of this total river associated population will be living within 45 miles downstream from the selected site.

Table R-1 presents river related populations by cumulative downstream miles for all the 160 by 20 miles of river front included in the 90 mile study area radius for these decades. Miles shown on the table represent the approximate distance between a point on the river directly east of the site itself and the point where the river is exiting a compass-radii sector as per Figure 1. It has been furthermore assumed that the total population of a sector area through which the river is flowing will be credited as river associated population. River mile distances were read from an official Coast Guard river map and related to the land parcel being traversed by the waterway. Mileage estimates are approximate, plus or minus one to two miles.

Cumulative river oriented population for the standard 50 mile area radius is approximately that shown for the 95 mile distance on the table. This 1900 square mile area (95 x 20 miles) typically represents 88-90% of the total 90 mile radius river adjoining population. For reader convenience these 50 mile totals are distinguished by parentheses in the table.

TABLE R-1. Cumulative Estimates of Populations Adjacent to the Columbia River*
by Cumulative Downstream River Miles and Selected Decades

Cumulative Downstream River Miles	1970	1980	1990	2000	2010	2020	2040	2060	2080	2100	2150	2200	2250	2300
10	296	316	352	388	388	388	388	388	388	388	388	388	388	388
25	298	319	356	392	392	392	392	392	392	392	392	392	392	392
35	27,056	28,941	31,964	35,886	38,990	42,994	44,138	45,282	46,426	47,570	50,430	53,290	56,150	59,010
45	63,007	67,397	74,432	82,367	89,639	97,807	100,255	102,707	105,159	107,611	113,741	119,871	126,001	132,131
60	63,964	68,355	75,356	83,308	90,576	98,744	101,196	103,648	106,100	108,552	114,682	121,812	126,942	133,072
75	75,667	76,894	86,197	94,818	103,278	112,793	115,713	118,612	121,611	124,588	132,088	139,725	147,692	155,465
(95)	(71,187)	(77,449)	(86,810)	(95,489)	(103,949)	(113,464)	(116,384)	(119,323)	(122,782)	(125,259)	(132,759)	(140,396)	(148,363)	(156,136)
100	72,919	79,479	89,202	98,040	106,531	116,071	119,034	121,973	124,913	127,898	135,417	143,073	151,059	158,851
115	73,195	79,755	89,478	98,322	106,807	116,347	119,310	122,249	125,183	128,174	135,693	143,349	151,335	159,127
130	73,888	80,623	90,521	99,453	107,987	117,576	120,554	123,508	126,457	129,463	137,020	144,714	152,738	160,568
135	74,234	80,969	90,867	99,799	108,333	117,922	120,900	123,854	126,797	129,809	137,366	145,060	153,084	160,914
150	77,340	85,275	96,373	105,905	114,737	124,624	127,701	130,754	133,796	136,907	144,712	152,645	160,926	169,004
160	79,365	87,403	98,604	108,188	117,115	127,097	130,274	133,444	136,596	139,807	147,862	156,052	164,402	172,548

*The 1970 estimate and subsequent decade projections includes all "Census districts" traversed by the Columbia River, which in effect works out to be about 10 miles on each side. Therefore, we assume that the river associated area is about 20 miles wide along the entire 160 miles contained in the study area. Total population in each compass radii sector traversed by the river is assumed to be river oriented population. In one or two cases specific cities outside a river traversed sector were included in the population counts. River mileage is measured as the distance between a point on the river directly east of the project site itself to the point where the river exits the Census District (see Figure 1). The cumulative estimates do not include the 250 to 300 residents living adjacent to the river but slightly above the project selected river point.

Note: Approximately 95 river miles are contained in the standard 50 mile radius. Cumulative populations to this point are distinguished in the table by parentheses.

APPENDIX

DESCRIPTION OF HMS POPULATION PROJECTION TECHNIQUES & ASSUMPTIONS

The 1970 population base for all projections was developed by overlaying a master diagram grid of radii and compass sectors on a Census Bureau "enumerator district" map centered at the Hanford Meteorological Station. The grid diagramed the 16 compass sectors and 10 mile radii intervals out to 90 miles (Figure 1). From this match up of census district and grid it was possible to estimate the percent of each city and census district land area within each compass-radii parcel or sector. The percent shares of these land areas were entered on the specially prepared diagram map presented as Figure 1. Populations for these land parcels were subsequently determined on the basis of each one's percent share of total land area for each of the census districts or city. For example, if the area falling in a compass radii sector accounted for 6% of that census district's total area, its population allocation was assumed to be 6% of the total population attributed to that census district. Cities were easier to assign to particular land parcels. Special care was taken, however, to assure that city population counts were subtracted from census district totals and allocated to their respective land parcel before the rural area population distribution was carried out.

Much of the baseline data (out to 50 miles and through 2000) had been assembled as part of an earlier Battelle population report.⁽²⁾ The previous data base detail and 1980-2000 projections were extensively reviewed for accuracy, consistency and likely application to this latest assignment. The check and verification concluded that the computed 1970 population base and projections for the 50 mile range by land and compass sector were correct and could be utilized here without the necessity of repeating the entire process within the 50 mile range. For the 1990 projections we felt it reasonable to interpolate between the projected 1980 and 2000 levels.

This verification process was extensive and included new information on growth forces which had not been available at the time of the original 50 mile population study. Among the new information which had been developed since the original preparation were detailed growth analyses for the three Tri-Cities which were contained in such reports as the Woodward and Clyde Study,⁽³⁾

The Battelle Gasoline Study,⁽⁴⁾ plus new information obtained from a complete updating of the Washington Public Power Supply System #2 Population Study.⁽⁵⁾ All of these named studies had directed special attention to foreseeable and in place economic developments for the Tri-Cities. Employment gains projected for these three cities had been translated into population growth and allocated to their applicable parcels. This later information gave further assurance that the 1980 forecasts for the 50 mile range were most reasonable and would be a proper base for extension to the 90 mile range.

In developing the 1980 forecasts for the 50-90 mile extension we continued the basic assumption of the earlier population forecasts. Our assumption had allowed that unless there was some specific irrigation development within the compass radii land parcels, only the cities (or land areas adjacent to them) would be experiencing measurable population change between 1975 and 1980. To account for city changes, we furthermore assumed that their average annual growth rate between 1975 and 1980 would be the same as that for 1970-1975 as reported in two publications - "Washington Population Trends"⁽⁶⁾ and "Population Estimates in Oregon Counties and Cities."⁽⁷⁾

Populations attributable to specific irrigation developments were estimated on the basis of the ratio of 16 additional persons per square mile of new land being irrigated⁽⁸⁾ and spread over the parcel as per their land share. Incremental rural and city population growth from all sources were entered for the various areas and new parcel totals obtained as representative of 1980 levels.

For the 1990 forecasts (both 50 mile and 90 mile extensions), we again assumed that the only growth taking place in rural areas would be that associated with irrigation developments. Consideration was given to accepting OBERs⁽⁹⁾ state projection series as being representative of 1980-1990 changes in area cities. However, on further study it appeared that city growth influences would be too varied to be expressed as a single and common rate. Instead we assumed that cities within each of the parcels could be expected to grow at about half the average annual rate between 1980-1990 as they had between 1975-1980. This period included a number of the major irrigation developments such as the Second Bacon Siphon and Tunnel, and Horse Heaven Hills. Incremental population changes for cities of rural areas were allocated to the impacted land periods and new totals obtained.

Lacking any other regional or state data for the 2000-2010 and 2010-2020 decades, it was necessary to utilize population growth forecasts prepared for the Columbia Pacific Northwest Region Study.⁽¹⁰⁾ Rather than cities or counties this study presented Pacific Northwest population growth in terms of "sub-regions". For this study we calculated that it would be reasonable for a subregion growth rate to be applied to each of its cities. We furthermore assumed that most of the irrigation developments would have been in place by this time and that no further population gains could be attributed to irrigation projects. As before, incremental population gain for each of the cities was entered within its applicable parcel added to the 1980 base and new sector (parcel) totals obtained.

For the years 2020 onward there were no state or regional population forecasts to serve as benchmarks. The only available growth rates were those for the nation as a whole and these extended only to the year 2051. U.S. Census Bureau Report P-25 No. 601⁽¹¹⁾ presented three alternative series population forecasts covering the period 1975-2051.

The fastest growing of these three series starts with an average annual increase of 0.7% in 1975 and declines to an average annual increase of about 0.2% by the year 2028. Following that year, the rate held steady through the period 2051. The middle one of this second series started with an average annual growth of 0.5% in 1975 which had declined to 0.1% by 2030. Following that, the series holds at that same rate through the final forecast year 2051. The lowest of the three growth predictions started with an average annual increase of 0.5% in 1975, declines to 0.1% by 2030, then holds at 0% growth for the next 21 years. Lacking any other evidence upon which to base our study area forecasts, we have assumed that the highest possible growth rate for any of the area cities from 2020 onward would be at the 0.2% level and the lowest at the 0% growth level. These growth rates were subsequently applied to the separate city population counts within their respective compass-radii sector, and the incremental growth added to the previous decade base. Growth was assumed only for cities, with rural area populations assumed to be holding steady. Note that under the low assumption (0% growth) the 2040 population forecasts for each parcel would hold at that same level through the year 2300.

Accordingly, the 14 diagrams and four tables accompanying this report reflect all these assumptions. The incremental additions attributable to each city or irrigated land area for the decade have been added to the previous base and new totals obtained for both the 144 parcels (or compass-radii sectors) and the study area as a whole. Admittedly, these forecasts could be in complete error upon the coming of any substantial new development to any area land parcel. Such developments would generate new growth influences which would completely alter the forecasts being presented here which are based on the best available information and in practical recognition of the economic developments which are expected to occur within the region over the foreseeable future.

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