

4.6 Socioeconomics

R.A. Fowler and M.J. Scott

Activity on the Hanford Site plays a dominant role in the socioeconomics of the Tri-Cities and other parts of Benton and Franklin counties (Figure 4.6-1). The agricultural community also has a significant effect on the local economy. Any major changes in Hanford activity would potentially affect the Tri-Cities and other areas of Benton and Franklin counties. Unless otherwise specifically cited, data in this section are collected from interviews with the referenced organization.

4.6.1 Local Economy

Three major sectors have been the principal driving forces of the economy in the Tri-Cities since the early 1970s: 1) DOE and its contractors operating the Hanford Site; 2) Energy Northwest (formerly the Washington Public Power Supply System) in its construction and operation of nuclear power plants; and 3) the agricultural community, including a substantial food-processing component. With the exception of a minor amount of agricultural commodities sold to local-area consumers, the goods and services produced by these sectors are exported outside the Tri-Cities. In addition to the direct employment and payrolls, these major sectors also support a sizable number of jobs in the local economy through their procurement of equipment, supplies, and business services.

In addition to these three major employment sectors, three other components can be readily identified as contributors to the economic base of the Tri-Cities. The first of these, loosely termed “other major employers,” includes the five major non-Hanford employers in the region (discussed in more detail in section 4.6.1.4). The second component is tourism. The Tri-Cities area has increased its convention business substantially in recent years as well as recreational travel. The third component in the economic base relates to the local purchasing power generated not from current employees, but from retired former employees. Government transfer payments, specifically retirement and disability insurance benefit payments constitute a significant proportion of total spendable income in the local economy.

4.6.1.1 DOE Contractors (Hanford)

DOE contractors comprise the largest single source of employment in the Tri-Cities. During fiscal year (FY) 2003, an average of 10,650 employees were employed by DOE Office of River Protection (ORP) and its prime contractor CH2M Hill Hanford Group, Inc.; DOE-Richland Operations Office (RL) and its prime contractor Fluor Hanford, Inc.; Battelle Memorial Institute which operates Pacific Northwest National Laboratory for the DOE Office of Science’s Pacific Northwest Site Office; Bechtel Hanford, Inc. (since replaced by the Washington Group, International); and the Hanford Environmental Health Foundation (since replaced by AdvanceMed Hanford [AMH]). Fiscal year 2003 year-end employment for all DOE contractors was 10,288, down from 10,938 during FY 2002. In addition to these totals, Bechtel National, Inc. (BNI) and its prime subcontractor Washington Group International employed 2045 at the end of FY 2003, down from 3013 at the end of FY 2002. (Bechtel Hanford is a subsidiary of Bechtel National. In 2003 Bechtel Hanford was the Environmental Restoration Contractor for the Hanford Site, planning, managing, and executing a full range of activities to clean up contaminated soils and inactive nuclear facilities under DOE’s Environmental Restoration Project.) During December 2000, ORP directly awarded a contract to BNI to design, build, and start up waste treatment facilities for the glassification of liquid radioactive waste. According to the Washington State Labor Market and Economic Analysis (LMEA) establishment the annual average number of employees at Hanford is down by more than 5000 from a peak of 19,200 during FY 1994, but still represents 13% of the 96,400 total jobs in the economy (LMEA 2004a).

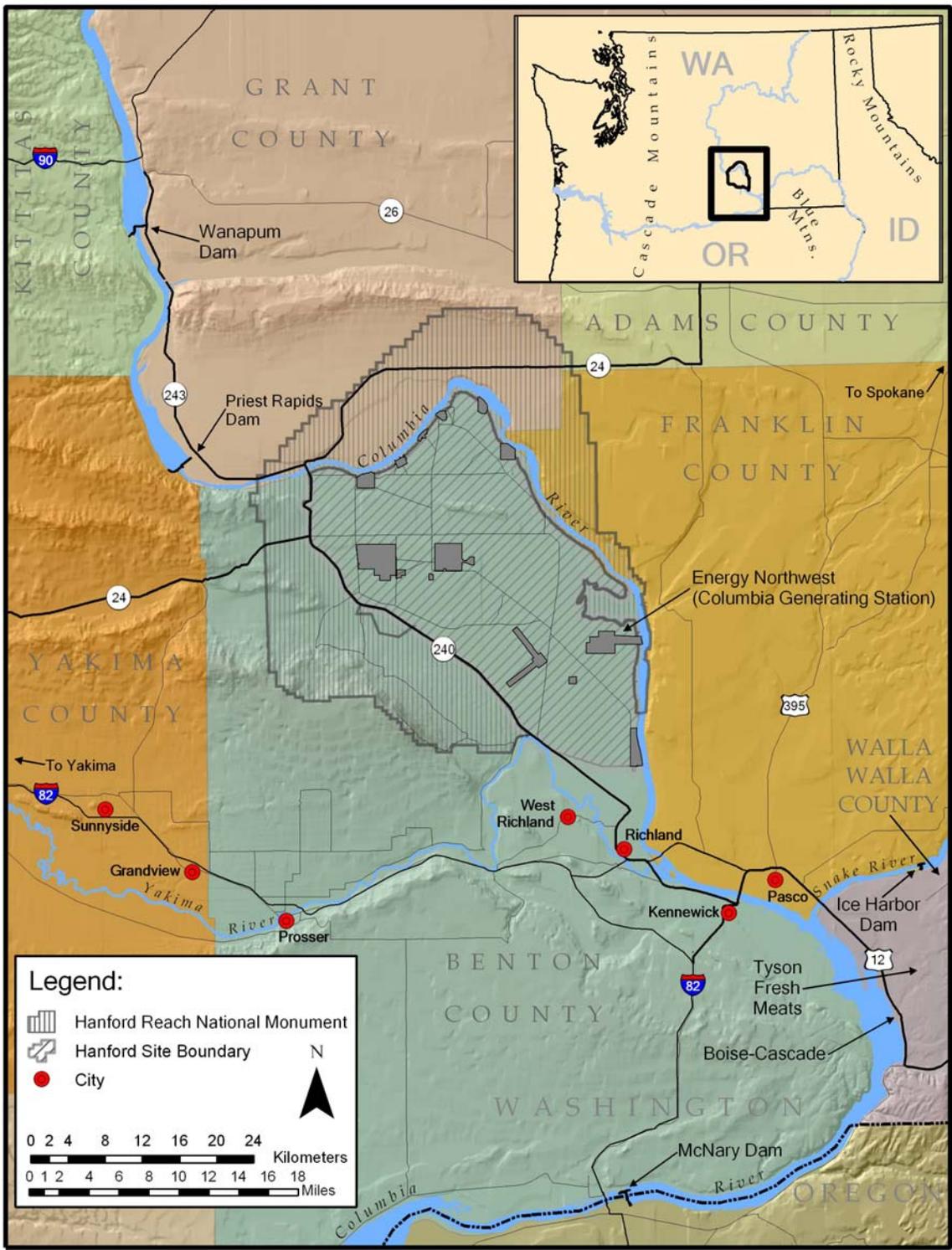


Figure 4.6-1. Hanford Site, Washington, and Surrounding Communities

Based on employee residence records as of April 2004, 91% of the direct employees of Hanford live in Benton and Franklin counties. Approximately 73% of Hanford employees reside in Richland, Pasco, or Kennewick. More than 36% are Richland residents, 10% are Pasco residents, and 27% live in Kennewick. Residents of other areas of Benton and Franklin counties, including West Richland, Benton City, and Prosser, account for about 18% of total Hanford Site employment.

4.6.1.2 Energy Northwest

Energy Northwest is a joint operating agency (JOA) comprised of 19 member public utilities from across the state of Washington. They provide electricity, at cost, to public utilities and municipalities in the Northwest and operate four electricity generating stations: Columbia Generating Station, Packwood Lake Hydroelectric Project, Nine Canyon Wind Project, and the White Bluffs Solar Station. Although activity related to commercial nuclear power plant construction ceased with the completion of the 1157-megawatt (MW) WNP-2 nuclear reactor during 1983 (now named Columbia Generating Station), Energy Northwest continues to be a major employer in the Tri-Cities area. Headquarters personnel based in Richland oversee the operation of the Columbia Generating Station. Decommissioning of mothballed nuclear power plants (WNP-1 and WNP-3), which were never completed, began during 1995. Since 2000, Energy Northwest has maintained an average of 20 employees at WNP-1, which is located near the Columbia Generating Station. As part of an effort to reduce electricity production costs, Energy Northwest headquarters decreased the size of its total workforce from over 1900 during 1994 to 1016 at the end of 1999. At the end of calendar year 2003, employment was 1261 personnel.

4.6.1.3 Agriculture

In 2003, over 11 percent of workers in Benton and Franklin counties were employed in agriculture. The total agricultural employment was 10,920, which was an increase from the 2002 total of 10,640 (LMEA 2004b). Seasonal farm workers are not included in that total but are estimated by the U.S. Department of Labor (DOL) for the agricultural areas in the state of Washington. During 2003, there was an average of 5005 seasonal farm workers per month in Benton, Franklin, and Walla Walla counties, ranging from 778 workers during the winter pruning season to 10,922 workers at the peak of harvest. An estimated average of 4197 seasonal workers were classified as local (ranging from 778 to 7956); an average of 24 were classified as intrastate (ranging from 0 to 129), and an average of 504 were classified as interstate (ranging from 0 to 2075). The weighted seasonal wage for 2003 ranged from \$7.01/hr to \$7.34/hr, with an average wage of \$7.16/hr (DOL 2004).

According to the U.S. Department of Commerce's Regional Economic Information System (REIS), 2467 people were classified as farm proprietors in Benton and Franklin counties during 2002. Total farm proprietors' income, according to this same source, was estimated to be \$32.8 million (DOC 2004).

The area's farms and ranches generate a sizable number of jobs in supporting activities, such as agricultural services (e.g., application of pesticides and fertilizers and irrigation system development) and wholesale trade (e.g., farm supply and equipment sales and fruit packing). Although formally classified as a manufacturing activity, food processing is a natural extension of the farm sector. As of May, 2004, 52 processors in Benton and Franklin counties produce such items as potato products, canned fruits and vegetables, wine, and animal feed. In 2003, food manufacturing jobs accounted for 53% of all the manufacturing jobs in the area.

4.6.1.4 Other Major Employers

During 2003, the five largest non-Hanford and non-government employers employed approximately 6522 people in Benton and Franklin counties. These companies include 1) ConAgra/ Lamb Weston, which employed 3063; 2) Tyson Fresh Meats (formerly Iowa Beef Processing Inc.), which employed 1450; 3) Boise Cascade Corporation Paper and Corrugated Container Divisions, which employed 862; 4) Framatome ANP, Richland Inc. (formerly Siemens Power Corporation), which employed 747; and 5) Wal-Mart (two stores), which employed 700. Both Boise Cascade and Iowa Beef are located in western Walla Walla County, but most of their workforce resides in Benton and Franklin counties. Four of the largest agriculture growers and processors in the area, AgriNorthwest, Broetje Orchards, J.R. Simplot Company, and Twin City Foods, Inc., employed approximately 2278 people during 2003; however, a large portion of the workers were seasonal (BFCOG 2003).

Other area employers include three major school districts: Richland, Kennewick, and Pasco, which employed a total of 4043; the three major health care facilities: Kadlec Medical Center, Kennewick General Hospital, and Lourdes Health Network, which employed a total of 2294; local government offices: Benton and Franklin county and Richland, Kennewick and Pasco city offices, which employed 1833, and the Tri-Cities Airport which employed 400.

4.6.1.5 Tourism

A significant rise in the number of visitors to the Tri-Cities over the last several years has resulted in tourism playing an increasing role in helping to diversify and stabilize the area economy. The Tri-Cities Visitors and Convention Bureau reported that 106,995 people attended meetings, conventions, sporting and group events, spending an estimated \$35.3 million in the mid-Columbia during 2003, down from 112,810 and \$37.3 million during 2002. The number of people attending conventions and group events has more than doubled from 1995 to 2002 and has more than tripled since 1991.

The importance of tourism is evidenced by the amount of money spent on local goods and services. Overall tourism expenditures in the Tri-Cities were over \$247 million during 2002, up from \$238 million during 2001. Travel-generated employment in Benton and Franklin counties was about 3660 with an estimated \$63.8 million in payroll, down from an estimated 4250 employed and up from a \$60.6 million payroll during 2001. In addition, tourism generated \$4.6 million in local taxes and \$17.7 million in state taxes during 2002 (OTED 2004a).

4.6.1.6 Retirees

In the Tri-Cities, as in many other places, retirees are a major source of consumer spending. Although Benton and Franklin counties have a relatively young population (approximately 52% under the age of 35), 20,228 people over the age of 65 resided in Benton and Franklin counties during 2003. Washington State Office of Financial Management (OFM) reports the portion of the total population 65 years and older in Benton and Franklin counties accounts for 9.9% of the total population, which is below the 11.3% for the state of Washington (OFM 2004a). This segment of the population supports the local economy through income received from government transfer payments and pensions, private pension benefits, and prior individual savings. Although the retirees are not employed, their income affects the local economy in much the same way as local spending on salaries by the federal government and the area's private sector employers.

Although information on private pensions and savings is not available, data are available regarding the magnitude of government transfer payments. REIS has estimated transfer payments by various programs

at the county level. Estimated major government transfer payments received by the residents of Benton and Franklin counties during 2002 totals greater than \$816 million (Table 4.6-1). Nearly 40% of the payments are for retirement and disability insurance benefit payments, which provide over \$321 million of spendable income to the local economy.

4.6.2 Employment and Income

Nonagricultural employment in the Tri-Cities grew steadily from 1988 to 1994. The total annual average employment fell during 1995 and 1996, but has grown every year since. During 2003, nonagricultural employment rose 3.2% (Table 4.6-2). There was an average of 83,200 non-agricultural jobs in the Tri-Cities during 2003, up approximately 2600 from 2002. The bulk of the gains were in the manufacturing and the trade, transportation, and utilities sectors. Modest gains were seen in the finance, insurance, real estate, services, and government sectors, while the information sector remained the same (LMEA 2004c).

Three measures of area income are presented in this section: total personal income, per capita income, and median household income. Total personal income comprises all forms of income received by the populace, including wages, dividends, and other revenues. Per capita income is equivalent to total personal income divided by the number of people residing in the area. Median household income is the point at which half of the households have incomes greater than the median and half have less.

During 2002, the total personal income was \$4.4 billion for Benton County and \$1.1 billion for Franklin County, compared to the State of Washington's total of \$198.0 billion. Per capita income during 2002 was \$29,086 for Benton County, \$20,715 for Franklin County, and \$32,638 for Washington State (DOC 2004). The preliminary estimate of median household income during 2002 for Benton County is \$52,515; for Franklin County is estimated at \$42,634, and for Washington is estimated at \$49,725 (OFM 2004b).

Table 4.6-1. Federal Government Transfer Payments in Benton County and Franklin County, Washington, 2002 ^(a)

Government Payments to Individuals	Benton County \$M	Franklin County \$M	Total \$M
retirement & disability insurance payments	257.0	64.2	321.2
medical payments	212.2	110.2	322.4
income maintenance benefit payments	51.8	30.2	82.0
unemployment insurance benefit payments	47.8	21.4	69.2
veterans benefit payments	12.6	2.9	15.5
federal education & training assistance payments	1.2	4.1	5.3
other payments to individuals	0.8	0.3	1.1
Total	583.4	233.3	816.70

(a) DOC 2004.

Table 4.6-2. Nonagricultural Wage and Salary Workers in Benton County and Franklin County, Washington, 2002 and 2003 ^(a)

Industry	2002 Annual Average (Revised)	2003 Annual Average (Preliminary)	Change 2002-2003 (%)
manufacturing	5,000	5,700	14.0
construction, nat. resources & mining	4,500	4,900	8.9
trade, transportation and utilities	13,100	13,800	5.3
information	1,000	1,000	0.0
finance, insurance, and real estate	3,000	3,100	3.3
services	38,600	39,100	1.3
government	15,400	15,600	1.3
Total nonagricultural wage and salary workers	80,600	83,200	3.2
(a) Source: Washington State Employment Security Department (LMEA 2004c).			

4.6.3 Demography

An estimated total of 151,600 people lived in Benton County and 53,600 lived in Franklin County during 2003, for a total of 205,200, which is up almost 7% from the Census 2000 figure (OFM 2004c). According to the 2000 Census, population totals for Benton and Franklin counties were 142,475 and 49,347, respectively (Census 2001a). Both Benton and Franklin counties grew at a faster pace than Washington as a whole during the 1990s. The population of Benton County grew 26.6%, up from 112,560 during 1990. The population of Franklin County grew 31.7%, up from 37,473 during 1990 (Census 2001a).

The distribution of the 2003 Tri-Cities population by city is as follows: Richland 41,650, Pasco 37,580, and Kennewick 57,900. The combined populations of Benton City, Prosser, and West Richland totaled 17,085 during 2003. The unincorporated population of Benton County was 34,965. In Franklin County, incorporated areas other than Pasco had a total population of 3845. The unincorporated population of Franklin County was 12,175 (OFM 2004c).

During 2003, Benton and Franklin counties accounted for 3.4% of Washington's population. The population demographics of Benton and Franklin counties are quite similar to those found within Washington. In general, the population of Benton and Franklin counties is somewhat younger than that of Washington. The 0- to 14-year old age group accounts for 24.8% of the total bi-county population as compared to 20.6% for Washington. The population in Benton and Franklin counties under the age of 35 is 52.2%, compared to 48.5% for Washington State (OFM 2004c).

The 2000 population figures by race and Hispanic origin indicate that in Benton and Franklin counties, Asians represent a lower proportion, and individuals of Hispanic origin represent a higher proportion of the population than in the state of Washington as a whole. Table 4.6-3 represents population

estimates and percentages by race and Hispanic origin for Benton, Franklin, Grant, Adams, and Yakima counties, and the 80-km (50-mi) radius of the Hanford Site.

4.6.4 Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations,” (59 FR 7629), directs federal agencies in the Executive Branch to consider environmental justice so that their programs will not have “disproportionately high and adverse human health or environmental effects” on minority and low-income populations. Executive Order 12898 further directs federal agencies to consider effects to “populations with differential patterns of subsistence consumption of fish and wildlife.” The Executive Branch agencies also were directed to develop plans for carrying out the order. The Council on Environmental Quality (CEQ) later provided additional guidance for integrating environmental justice (EJ) into the National Environmental Policy Act process in a December 1997 document, *Environmental Justice Guidance under the National Environmental Policy Act* (CEQ 1997).

Minority populations are defined as all nonwhite individuals, plus all white individuals of Hispanic origin, as reported in the 2000 Census (Census 2001b). Low-income persons are defined as living in households that report an annual income less than the United States’ official poverty level, as reported by the Census Bureau. The poverty level varies by size and relationship of the members of the household. The year 2000 poverty level was \$17,761 for a family of four (Census 2000, 2001a). Nationally, during 1999, 29.9% of all persons were minorities, and 11.8% of all persons lived in households that had incomes less than the poverty level (which was \$17,029 for a family of four during that year) (Census 2000, 2001a). The 2000 Census reports that 10.6% of Washington’s population lived in poverty during 1999, while 10.3% of Benton County persons and 19.2% of Franklin County persons were below the poverty level (Census 2003a).

Based on the 2000 census (Census 2001b,c), the 80-km (50-mi) radius area surrounding the Hanford Site had a total population of 482,300 and a minority population of 178,500.^(a) The ethnic composition of the minority population is primarily White Hispanic (24 percent), self-designated “other and multiple” races (63 percent), and Native American (6 percent). Asians and Pacific Islanders (4 percent) and African Americans (3 percent) make up the rest. The Hispanic population resides predominantly in Franklin, Yakima, Grant, and Adams counties. Native Americans within the 80-km (50-mi) area reside primarily on the Yakama Reservation and upstream of the Hanford Site near the town of Beverly, Washington.

The low-income population during 2000 was approximately 80,800, or 17 percent of the total population residing in the 80-km (50-mi) radius of the Hanford Meteorological Station at the center of the Hanford Site (Census 2002 a, b), about the same percentage as the 1990 Census. The majority of these households were located to the southwest and northwest of the Site (Yakima and Grant counties) and in the cities of Pasco and Kennewick.

^(a) The Hanford Site National Environmental Policy Act (NEPA) Characterization Rev.14 (2002) shows the total population “within” 80 km as 511,500, which was estimated by a geographical information system from the populations of individual census block groups, the smallest geographic area for which both minority and poverty status were estimated in the 2000 Census. The higher number resulted because the total population of a census block group was previously assigned to the 80-km area if *any part* of the block group lay within 80 km of the Hanford Meteorological Station in the middle of the Hanford Site. The new estimate splits boundary block groups to include only those portions within 80 km, which should result in a lower and more accurate estimate.

Table 4.6-3. Population Estimates and Percentages by Race and Hispanic Origin within each County in Washington State and the 80-km (50 mi) Radius of Hanford as Determined by the 2000 Census (Census 2003b)

4.120

Subject	WA State	Percent	Benton/Franklin/ Grant/Adams/ Yakima	Percent	Benton County	Franklin County	Grant County	Adams County	Yakima County	80-km (50-mi) Radius of Hanford ^(a)
Total population	5,894,121	100	505,529	100	142,475	49,347	74,698	16,428	222,581	482,280
Single race	5,680,602	96.4%	489,206	96.8%	138,646	47,302	72,451	15,977	214,830	466,626
White	4,821,823	81.8%	367,283	72.7%	122,879	30,553	57,174	10,672	146,005	347,047
Black or African American	190,267	3.2%	5,494	1.1%	1,319	1,230	742	46	2,157	5,507
American Indian/Alaska Native	93,301	1.6%	12,468	2.5%	1,165	362	863	112	9,966	10,288
Asian	322,335	5.5%	6,809	1.3%	3,134	800	652	99	2,124	6,681
Native Hawaiian/Pacific Islander	23,953	0.4%	482	0.1%	163	57	53	6	203	479
Other race	228,923	3.9%	96,670	19.1%	9,986	14,300	12,967	5,042	54,375	96,625
Two or more races	213,519	3.6%	16,323	3.2%	3,829	2,045	2,247	451	7,751	15,654
Hispanic origin (of any race) ^(b)	441,509	7.5%	150,951	29.9%	17,806	23,032	22,476	7,732	79,905	149,588
<p>(a) Includes a portion of Oregon</p> <p>(b) Hispanic origin is not a racial category. It may be viewed as the ancestry, nationality group, lineage, or country of birth of the person or person's parents or ancestors before arrival in the United States. Persons of Hispanic origin may be of any race and are counted in the racial categories shown.</p>										

Figure 4.6-2 shows the location of Census block groups from the 2000 Census that had either a majority of residents who were members of a minority group (racial minority or Hispanic), or whose percentage of residents belonging to any minority group was at least 20 percentage points greater than the corresponding percentage of the state population (Census 2001a,b,c).

Figure 4.6-3 shows the location of Census block groups from the 2000 Census that had either a majority of residents who were low income (members of a household below the national poverty level), or a percentage of low-income residents at least 20 percentage points greater than the corresponding percentage of the state population (Census 2002 a,b).

The CEQ guidance for identifying potential disproportionate impacts on minority and low-income populations recognizes that some minority and low-income groups may be more reliant than the majority population on subsistence hunting, fishing, and gathering activities (sometimes for species unlike those consumed by the majority population), or may be dependent on water supplies or other resources that are atypical or used at different rates than other groups. These differential patterns of resource use are to be identified “where practical and appropriate”. While no hunting and gathering activities currently occur on the Hanford Site, some Native Americans of various tribal affiliations who live in the greater Columbia Basin do participate in tribal fishing for salmon and resident fish that utilize the Hanford Reach for habitat.

Fishing access rights for Native Americans is guaranteed by federal treaty. For example, The Treaty of 1855 with the Confederated Tribes and Bands of the Yakama Nation (Yakama 1855) secured to the Yakamas, “the right of taking fish at all usual and accustomed places, in common with the citizens of the Territory [now the state of Washington] and of erecting temporary buildings for curing them; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed lands” ceded to the government. Some of this ceded territory is located on the Hanford Site. Similar guarantees were extended to the Umatilla, Nez Perce, and Warm Springs groups. The Wanapum, a non-treaty tribe, historically lived along the Columbia River and continue to live upstream of the Hanford Site. They fish on the Columbia River and gather food resources near the Hanford Site. The Confederated Tribes of the Colville Reservation established by the Executive Order of April 9, 1872, traditionally fished and gathered food resources in the Hanford area. They also are recognized as having cultural and religious ties to the Hanford Site.

The Walker Research Group (Walker and Pritchard 1999) discussed the historical location of Native fishing sites, the level and productivity of fishing effort, estimates from several studies of fish consumption in traditional Native American diets (Hewes 1947, 1973; Hunn and Bruneau 1989; Walker 1967), and possible exposure levels to radionuclides. According to the fish consumption studies, annual rates of fish consumption by Native Americans in the region before European contact ranged from 23 kg (50 lbs) to as much as 438 kg (900 lbs). Estimates of contemporary fish consumption (CRITFC 1994, Harris and Harper 1997) tend to be somewhat lower, but still indicate a heavy reliance on fish among Native Americans following a traditional diet.

4.6.5 Housing

During FY 2003, 2927 houses were sold in the Tri-Cities at an average price of \$160,611, compared to 2603 houses sold at an average price of \$151,902 during 2002 (TCAR 2004). During FY 2003, 1750 single-family houses were built, up 43% from the 1227 that were built during 2002. The FY 2003 total had surpassed the previous annual peak of 1117 during 1994 (WCRER 2004a).

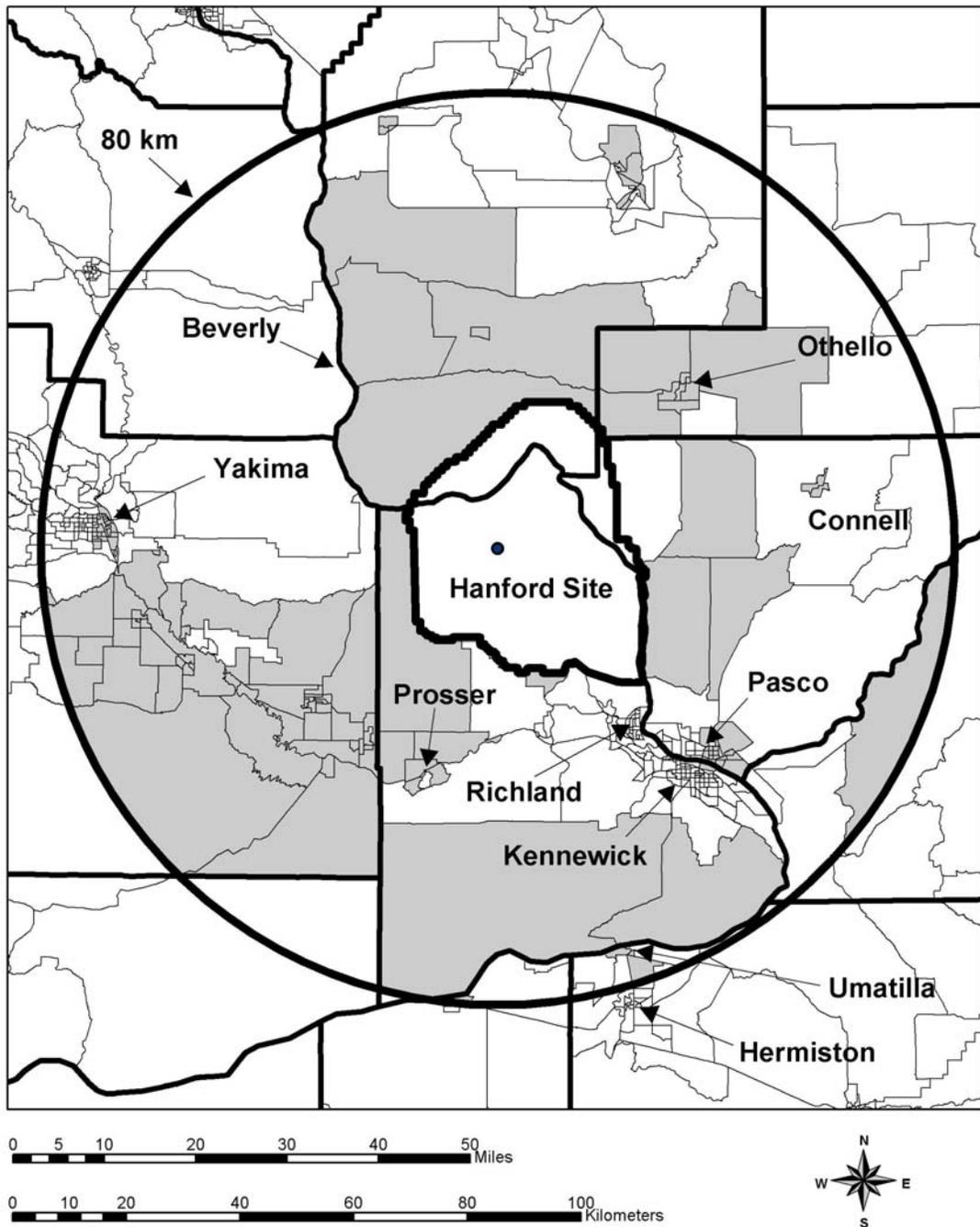


Figure 4.6-2. Location of Minority Populations Near the Hanford Site, Washington, based on 2000 Census. Shaded areas indicate regions that have a majority of residents who are members of a minority group, or for which the percentage of minority population is 20 percentage points greater than the statewide average. Minority groups include all non-white individuals, plus Hispanic whites.

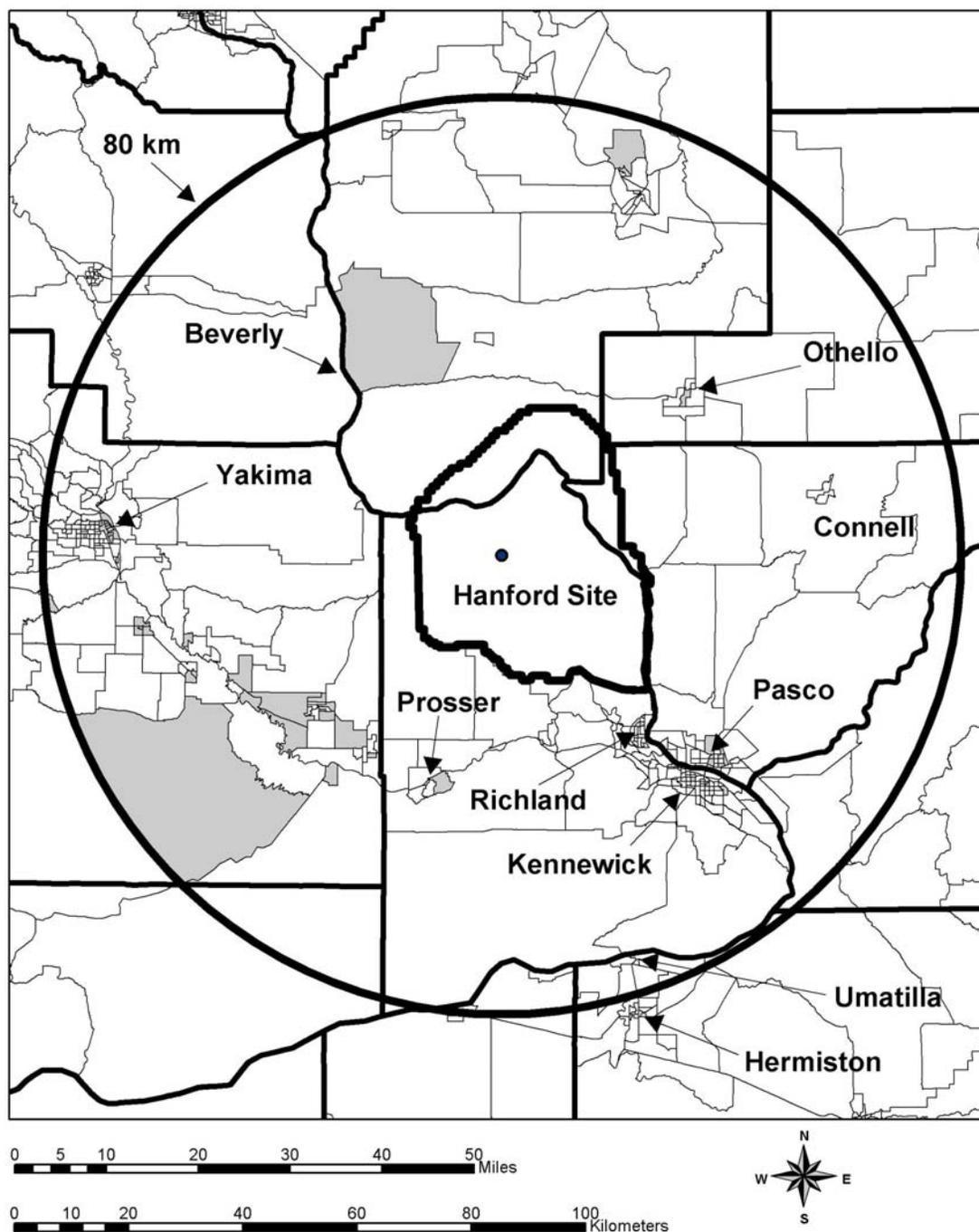


Figure 4.6-3. Location of Low-Income Populations Near the Hanford Site, Washington, based on 2000 Census. Shaded areas indicate regions that have a majority of low-income residents, or for which the percentage of low-income population is 20 percentage points greater than the statewide average. Low-income persons live in households with incomes that fall below the official U.S. poverty level (\$17,761 for a family of four in the year 2000).

As of April 1, 2003, there were an estimated 77,521 housing units in Benton and Franklin counties, which is 32.4% more than the 58,541 during 1990 (OFM 2004d). The number of apartments has increased from 8225 during 1990 to 10,936 during 2003. The vacancy rate of apartments in Benton and Franklin counties during September 2003 was 5.5%, and the average rent was \$606 per month. These figures are up from the 2.7% vacancy rate but down from the \$611 average rent during 2002 (WCRER 2004b).

4.6.6 Transportation

The Tri-Cities serves as a regional transportation and distribution center with major air, land, and river connections. The Burlington Northern and Santa Fe Railway (BNSF) and Union Pacific Railroad provide direct rail service. Union Pacific Railroad operates the largest fleet of refrigerated rail cars in the United States and is essential to food processors, which ship frozen food from this area. Passenger rail service is provided by Amtrak, which has a station in Pasco. Rail service on the Hanford Site is maintained and operated by the Tri-City and Olympia Railroad Company.

Docking facilities at the Ports of Benton, Kennewick, and Pasco are important aspects of this region's infrastructure. These facilities are located on the 525-km- (325.5-mi-) long commercial waterway, which includes the Snake and Columbia rivers, that extends from the Ports of Lewiston-Clarkston in Idaho to the deep-water ports of Portland, Oregon, and Vancouver, Washington (see Figure 4.3-7).

Daily air passenger and freight services connect the area with most major cities through the Tri-Cities Airport, located in Pasco. This modern commercial airport links the Tri-Cities to major hubs and provides access to destinations anywhere in the world. There are two runways, a main runway and a minor runway for use during crosswinds. The main runway is equipped for precision instrumentation landings and takeoffs. Each runway is 2347 m (7700 ft) long and 46 m (150 ft) wide, and can accommodate landings and takeoffs by medium-range commercial aircraft, such as the Boeing 727-200 and Douglas DC-9.

During 2003, Delta Airlines, Skywest, and Horizon Air provided daily connections to domestic and international flights through Salt Lake City, Seattle, Denver, Spokane, and Portland. There were 203,729 enplanements at the Tri-Cities Airport during 2003, which was down from 210,351 enplanements during 2002, which was a record for the airport. From 1995 to 2002, the number of annual passenger increased 25 percent. Projections indicate that the terminal can serve almost 300,000 passengers annually.

The Tri-Cities region has three general aviation airports that serve private aircraft. The Richland Airport, owned by the Port of Benton, is located northwest of the Richland central business district, adjacent to the Richland by-pass highway (SR-240). Vista Field Airport, owned by the Port of Kennewick, is located at the intersection of Columbia Center Boulevard and Canal Drive, with easy access to SR-240, I-82, and I-182. The Prosser Airport, owned by the Port of Benton, is located 1.61 km (1 mi) northwest of the business district of Prosser and is adjacent to US-12. Airfreight shippers that service the region include Airborne from Richland, United Parcel Service from Kennewick, and Federal Express from the Tri-Cities Airport in Pasco.

Mass transit within the Tri-Cities is provided by the Ben Franklin Transit system. The system covers more than 1523 km² (588 mi²) and provides frequent service to all four local communities (Richland, Kennewick, Pasco, and West Richland). As of the end of 2003 the Ben Franklin fleet consists of 71 buses, 57 Dial-a-Ride para-transit vehicles, and 162 VanPool vans. The total number of boardings in 2003 was 3,790,146, a 3.4% increase from 2002 (BFT 2003). Two local taxi companies provide radio-dispatched taxicab service 24 hours per day: A-1 Tri-Cities Taxi and Tri-City Cab.

The regional transportation network in the Hanford vicinity includes the areas in Benton and Franklin counties from which most of the commuter traffic associated with the Site originates. Interstate highways that serve the area are I-82 and I-182. I-82 is 8 km (5 mi) south-southwest of the Site. I-182, a 24-km (15-mi)-long urban connector route, located 8 km (5 mi) south-southeast of the Site, provides an east-west corridor linking I-82 to the Tri-Cities area. I-90, located north of the Site, is the major link to Seattle and Spokane and extends to the East Coast. I-82 serves as a primary link between Hanford and I-90, as well as I-84. I-84, located south of the Site in Oregon, is a major corridor leading to Portland, Oregon. SR 224 (Van Giesen Street), also south of the Site, serves as a 16-km (10-mi) link between I-82 and SR 240. SR 24 enters the Site from the west, continues eastward across the northernmost portion of the Site, and intersects SR 17 approximately 24 km (15 mi) east of the Site boundary. SR 17 is a north-south route that links I-90 to the Tri-Cities and joins U.S. Route 395, continuing south through the Tri-Cities. U.S. Route 395 north also provides direct access to I-90. SR 240 and SR 24 traverse the Site and are maintained by Washington State.

A DOE-maintained road network within the Hanford Site consists of 607 km (377 mi) of asphalt-paved road and provides access to the various work centers. Primary access roads to the industrial areas of the Hanford Site are Routes 1, 2, 3, 5, 6, 10, 11, and Beloit Avenue (Figure 4.0-1). Public access to the 200 Areas and interior locations of the Hanford Site has been restricted by guarded gates at the Wye Barricade (at the intersection of Routes 10 and 4), the Yakima Barricade (at the intersection of SR 240 and Route 11A), and Rattlesnake Barricade south of the 200 West Area. None of those roadways have experienced any substantial congestion except Route 4 (WHC 1994).

Access to the Hanford Site is via four main routes: Hanford Route 4S from Stevens Drive in the City of Richland, Route 10 from SR 240 near its intersection with SR 225, Beloit Avenue from SR 240, or Route 11A from SR 240 near its intersection with SR 24. Another route, through the Rattlesnake Barricade, is located 35 km (22 mi) northwest of Stevens Drive and is for passenger vehicle access only. The estimated total number of commuters to this area is 3100. Approximately 87 percent of the workers commuting to the 200 Areas are from the Tri-Cities, West Richland, Benton City, and Prosser (Perteet *et al.* 2001). The remaining workers commute from the surrounding counties of Yakima, Adams, Grant, and Walla Walla.

The portion of SR 240 most affected by 200 Area commuters is between U.S. 395 in Kennewick and Stevens Drive. Portions of this roadway currently operate below the minimum level of service established by the Regional Transportation Planning Organization. Peak annual average daily traffic (AADT) on the section from Columbia Center Boulevard to I-182 is 54,000 (Perteet *et al.* 2001).

I-182 has peak traffic counts of 35,000 AADT in the vicinity of SR 240 in Richland. I-182 deficiencies at the interchanges with Queensgate Drive and 20th Avenue. SR 224 (Van Giesen Street) transports most of the commuters from West Richland and Benton City to SR 240. The intersection of SR 224 and SR 240 is the only section of SR 224 with current level of service (LOS) deficiencies. LOS is a qualitative measure of a roadway's ability to accommodate vehicular traffic, ranging from free-flow conditions (LOS A) to extreme congestion (LOS F). LOS D is considered the lower end of acceptable LOS (Perteet *et al.* 2001).

Stevens Drive (in and north of Richland) has peak traffic counts of 8300 AADT at Horn Rapids Road and 22,000 AADT just north of its intersection with SR 240 (Bypass Highway). Currently this roadway experiences LOS deficiencies. George Washington Way is the principal north-south arterial through Richland. AADT at the entrance of the Hanford Site on George Washington Way is 1800. Counts north of McMurray are 18,000 AADT and counts on George Washington Way just north of I-182 are 43,000

AADT. George Washington Way has LOS deficiencies between I-182 and Swift Boulevard (Perteet *et al.* 2001).

Private vehicles account for 91 percent of the person trips to the Hanford Site. The remaining person trips are by forms of high occupancy vehicles (mostly Ben-Franklin Vanpools). Of the 91 percent of private vehicles only 3 percent are by carpool with the remaining 88 percent being single-occupancy vehicles. The Draft Regional Transportation Plan identifies 11,468 employees working at Hanford. Based on 88 percent of the trips carrying a single person to Hanford, 10,092 single occupancy trips are made daily or an AADT of 10,184 (Perteet *et al.* 2001). Several local highway construction projects are underway to reduce some of the traffic bottlenecks.

The Hanford Site rail system originally consisted of approximately 210 km (130 mi) of track. It connected to the Union Pacific Railroad commercial track at the Richland Junction (at Columbia Center in Kennewick) and to a now abandoned commercial right-of-way (Chicago, Milwaukee, St. Paul and Pacific Railroad) near Vernita Bridge in the northwest section of the Site. Prior to 1990, annual railcar movements numbered about 1400 sitewide, transporting materials including coal, fuel, hazardous process chemicals, and radioactive materials and equipment (DOE 1996b). During October 1998, 26 km (16 mi) of track from Columbia Center to Horn Rapids Road were transferred to the Port of Benton and are currently operated by the Tri-City and Olympia Railroad. The Port of Benton has been granted the right to operate portions of the railroad on the Hanford Site.

4.6.7 Educational Services

Most of the primary and secondary students in the Tri-Cities area are served by the Richland, Pasco, Kennewick, and Kiona-Benton (Benton City) school districts. The total 2003 fall enrollment for all districts in Benton and Franklin counties was 42,759 students, an increase of 1.8% from the 2002 total of 41,999 students. The 2003 totals include 9790 students from the Richland School District, down from 9800 during 2002; 10,477 students from the Pasco School District, up from 9785 during 2002; 14,981 students from the Kennewick School District, up from 14,698 during 2002; and 1459 from the Kiona-Benton School District, down from 1664 during 2002 (OSPI 2004).

There are fourteen private elementary and secondary schools in the Tri-Cities, including Bethlehem Lutheran (K-8), Calvary Christian (K-5), and St. Joseph's (K-8) in Kennewick; Christ the King (K-8) and Liberty Christian (K-12) in Richland; and Kingspoint Christian (K-12), Country Haven Academy, St. Patrick's (K-8), Tri-City Junior Academy (K-10), and Tri-Cities Prep Catholic High School in Pasco. Fall 2003 enrollment at these schools totaled 2292 students, slightly lower than from the 2002 total of 2300 (OSPI 2004).

Post-secondary education in the Tri-Cities area is provided by Columbia Basin College (CBC), City University, and Washington State University, Tri-Cities branch campus (WSU-TC). The 2001 fall/winter enrollment was 7750 at CBC, 300 at City University, and 1200 at WSU-TC. Many of the programs offered by these three institutions are geared toward the vocational and technical needs of the area. During 2002-03, CBC offered 22 Associate in Applied Science (AAS) degree programs. City University offers three undergraduate and four graduate programs, plus access to several more programs through distance learning. WSU-TC offers 16 undergraduate and 14 graduate programs, as well as access to graduate programs via satellite.

4.6.8 Health Care and Human Services

The Tri-Cities has three major hospitals and five minor emergency centers. All three hospitals offer general medical services and include a 24-hr emergency room, basic surgical services, intensive care, and neonatal care.

Kadlec Medical Center, located in Richland, has 153 beds and functioned at 66.8% capacity with 8489 total admissions during 2003. Non-Medicare/Medicaid patients accounted for 41% of Kadlec's admissions during 2003. An average stay of 4.27 days per admission was reported for 2003.

Kennewick General Hospital maintained a 39% occupancy rate of its 101 beds with 4612 total admissions during 2003. Non-Medicare/Medicaid patients represented 41% of its total admissions. An average stay of 3.1 days per admission was reported during 2003.

Our Lady of Lourdes Hospital operates a 132-bed Health Center, located in Pasco, providing acute, sub-acute, skilled nursing and rehabilitation, and alcohol and chemical dependency services. Our Lady of Lourdes operates the Carondolet Psychiatric Care Center, a 32-bed psychiatric hospital located in Richland. They also provide a significant amount of outpatient and home health services. For calendar year 2003, Our Lady of Lourdes had a total of 4022 admissions, 21% of which were non-Medicare/Medicaid. Lourdes had an average acute care length of stay of 5.6 days, and the occupancy rate was 34% during 2003.

The Tri-Cities offers a broad range of social services. State human service offices in the Tri-Cities include the Job Service Center within the Employment Security Department; food stamp offices; Developmental Disabilities Division; financial and medical assistance; Child Protective Service; emergency medical service; a senior companion program; and vocational rehabilitation.

The Tri-Cities is also served by a large number of private agencies and voluntary human service organizations. The United Way, an umbrella fund-raising organization, incorporated 19 Community Impact Partners and 7 Community Solutions Partners during 2003. The Community Impact budget was \$27.6 million, which funded 34 programs during 2003. The Community Solutions budget was \$2.0 million, which funded 8 programs during 2003. The number of organizations receiving donor designations was 497.

4.6.9 Police and Fire Protection

Benton and Franklin counties' sheriff departments, local municipal police departments, and the Washington State Patrol Division, with headquarters in Kennewick, provide police protection in Benton and Franklin counties, for a total of 347 officers (commissioned and reserved) in the Tri-Cities (Table 4.6-4). The Kennewick Municipal Police Department maintains the largest staff of commissioned officers with 87.

Fire protection is provided by the fire departments of the cities of Kennewick, Pasco, and Richland, and by Benton County Rural Fire Departments #1, #2, and #4. A total of 357 fire fighting personnel (187 paid and 170 volunteer) are on staff in the Tri-Cities.

In addition, the Hanford Fire Department, a highly trained and professional career industrial fire department with 145 members, provides fire protection on the Hanford Site and nearby areas. There are four fire stations strategically located on the Hanford Site. From these stations four pumper crews, staffed

Table 4.6-4. Police Personnel in the Tri-Cities, Washington, 2004

Area	Commissioned Officers	Reserve Officers	Patrol Cars
Kennewick Municipal	87	6	20
Pasco Municipal	54	14	21
Richland Municipal	53	7	13
West Richland Municipal	12	7	14
Benton County Sheriff	56	10	56
Franklin County Sheriff	<u>23</u>	<u>8</u>	<u>24</u>
Tri-Cities total	285	62	148

with at least three firefighters each, provide suppression response. Four ambulance crews (one in each fire station), staffed with two firefighters (Emergency Medical Technicians [EMT] - or paramedic-trained), provide emergency medical services 24 hr/day, 7 days/week. A total of 40 emergency response vehicles, representing diverse capabilities, are maintained at the four fire stations. Some emergency equipment is specifically intended to control situations exclusive to the Hanford Site.

The Hanford Fire Department provides coverage to the entire Hanford Site and to SR 240 and SR 24. Coverage on the highways extends from the Vernita Bridge to the Silver Dollar Cafe on SR 24 and along SR 240 from the Yakima Barricade to the intersection with SR 225. Additionally, the Hanford Fire Department responds to mutual aid requests from 10 surrounding fire districts.

Table 4.6-5. Fire Protection Personnel in the Tri-Cities, Washington, 2003

Fire Department	Fire Fighting Personnel	Volunteers	Total	Service Area
Hanford	145	0	145	Hanford Site
Kennewick	69	0	69	City of Kennewick
Pasco	45	0	45	City of Pasco
Richland	56	0	56	City of Richland
BCRFD ^(a) 1	7	100	107	Kennewick Area
BCRFD 2	5	30	35	Benton City
BCRFD 4	<u>5</u>	<u>40</u>	<u>45</u>	West Richland
Tri-Cities total	332	170	502	

(a) BCRFD = Benton County Rural Fire Department.

4.6.10 Parks and Recreation

The convergence of the Columbia, Snake, and Yakima rivers offers residents of the Tri-Cities a variety of recreational opportunities. The Lower Snake River Project includes Ice Harbor, Lower Monumental, Little Goose, and Lower Granite locks and dams, and a levee system and parkway at Clarkston and Lewiston (see Figure 4.3-7). Although navigation capabilities and the electrical output are the major benefits of this project, recreational benefits have also resulted. The Lower Snake River Project provides boating, camping, and picnicking facilities in nearly a dozen areas along the Snake River. During FY 2003, 1.8 million people visited the area and participated in activities along the river.

Similarly, the Columbia River provides ample water recreational opportunities on the lakes formed by the dams. Lake Wallula, formed by McNary Dam, offers a large variety of parks and activities that attracted more than 4.4 million visitors during FY 2003. The Columbia River Basin is also a popular area for migratory waterfowl and upland game bird hunting.

Other opportunities for recreational activities in the Tri-Cities are accommodated by indoor and outdoor facilities including numerous tennis courts, ball fields, and golf courses which offer outdoor recreation to residents and tourists (see Table 4.6-6). Several privately owned health clubs in the area offer indoor tennis and racquetball courts, pools, and exercise programs. Bowling lanes and skating rinks also serve the Tri-Cities.

4.6.11 Utilities

The principal source of water in the Tri-Cities and the Hanford Site is the Columbia River. The water systems of Richland, Pasco, and Kennewick drew a large portion of the 51.5-billion L (13.6-billion gal) used during 2003 from the Columbia River. Each city operates its own supply and treatment system. The Richland water supply system derives about 82% of its water directly from the Columbia River, while the remainder is split between a well field in North Richland (that is recharged from the river) and groundwater wells. The city of Richland's total usage during 2003 was 23.5 billion L (6.2 billion gal). The city of Pasco system also draws from the Columbia River for its water needs. During 2003, Pasco consumed 14.01 billion L (3.7 billion gal). The Kennewick system uses two wells and the Columbia River for its supply. These wells serve as the sole source of water between November and March and can provide approximately 40% of the total maximum supply of 30 billion L (8 billion gal). Total 2003 usage in Kennewick was 14.01 billion L (3.7 billion gal). A significant part of Kennewick's residents (about 15,000 residential customers) draw irrigation water from the Kennewick Irrigation District, which has the Yakima River as its source (Tri-City Herald 2001).

The major incorporated areas of Benton and Franklin counties are served by municipal wastewater treatment systems, whereas the unincorporated areas are served by onsite septic systems. Richland's wastewater treatment system processed an average flow of 22.3 million L/d (5.8 million gal/d) during 2003 and is designed to treat 43.1 million L/d (11.4 million gal/d). Kennewick's waste treatment system processed an average 21.6 million L/d (5.7 million gal/d) during 2003. Their system is capable of treating about 46.1 million L/d (12.2 million gal/d). Pasco's waste treatment system processed an average 11.0 million L/d (2.9 million gal/d) and is capable of treating 16.1 million L/d (4.25 million gal/d).

The Benton County Public Utility District, Franklin County Public Utility District, and City of Richland Energy Services Department provide electricity to the Tri-Cities and surrounding areas. Nearly all the power these utilities provide in the local area is purchased from the Bonneville Power Administration (BPA), a federal power-marketing agency. These three utilities served nearly 83,000

Table 4.6-6. Examples of Physical Recreational Facilities Available in the Tri-Cities, Washington

Activity	Facilities
team sports	Baseball fields and basketball courts are located throughout the Tri-Cities. Soccer and football fields are also located in various areas. Spectator sports include minor league baseball and junior professional hockey.
bowling	Lanes in each city, including Fiesta Bowling Center, Celebrity Bowl, and Go-Bowl.
camping	Several hundred campsites within driving distance from the Tri-Cities area, including Fishhook Park and Sun Lakes.
fishing	Steelhead, sturgeon, trout, walleye, bass, and crappie fishing in the lakes and rivers near the Tri-Cities.
golf	Several public courses including Sun Willows, Columbia Park, Canyon Lakes, Columbia Point, Buckskin, and West Richland Municipal, two semi-private courses, two private courses, and a number of driving ranges and pro shops.
hunting	Duck, geese, pheasant, and quail hunting. Deer and elk hunting in the Blue Mountains and the Cascade Range.
skating	Roller-skating in Richland, Kennewick, and Prosser; recreational ice skating in Kennewick; junior professional ice hockey arena available to the public in Kennewick.
water sports	Public swimming pools in Pasco, Kennewick, and Richland, plus numerous private club pools. Boating, sailing, windsurfing, diving, water-skiing, swimming, etc. on the Columbia River, with 31 boat ramps in the Tri-Cities.
tennis	Several outdoor city courts in each city, with additional outdoor courts located at area schools. Two private health clubs have indoor courts available.
walking/bicycling	Over 30 miles of paved bike/hike paths and 5600 acres of parks.

customers and had 3.03 billion kilowatt-hour (kWh) total sales during 2003. The average rate for residential customers was approximately \$0.0647/kWh during 2003, up slightly from \$0.0646 during 2002. The Benton Rural Electrical Association serves portions of the rural areas of Benton and adjacent counties.

Electrical power for the Hanford Site is purchased wholesale from BPA, which provided 92% of the electricity consumed on the Hanford Site during 2003. Energy requirements for the Hanford Site during FY 2003 were over 250 million kWh for a total cost of \$8.6 million. Additionally, the Site spends about \$0.024/kWh for electrical transportation and distribution within the Hanford Site.

Natural gas, provided by the Cascade Natural Gas Corporation, serves a small portion of local residents, with 11,261 residential customers served in 2003. The average annual gas bill for residential customers is approximately \$1100. The Cascade Natural Gas Corporation also serves the Hanford Site 300 Area.

Wind energy is a new but growing component of the mix of Pacific Northwest generating resources, and is quite visible in the Tri-Cities area. Phase I of FPL Energy's Stateline wind generation project (180 megawatt [MW]) entered service during December 2001 near Walla Walla, and Energy Northwest's Nine

Mile Canyon Wind Farm (48 MW) entered service during October 2002 near Kennewick (American Wind Energy Association 2003). A number of other wind power projects (including a 40 MW Phase II for Stateline) have been proposed for the Northwest, although many have been put on hold because of low electricity demand, declining wholesale electricity prices and reduced economic activity due to recession. At prices of 4.0 to 6.0 cents per kWh, wind energy is close to competitive with other sources, despite relatively high costs per installed kWh and capacity factors of around 35 percent (OTED 2004b). A capacity factor is the net electricity generated, for the period of time considered, to the energy that could have been generated at continuous full-power operation during the same period. For comparison, the average capacity factor for nuclear plants in the United States in 2002 was 90 percent (EIA 2004).

4.6.12 Land Use

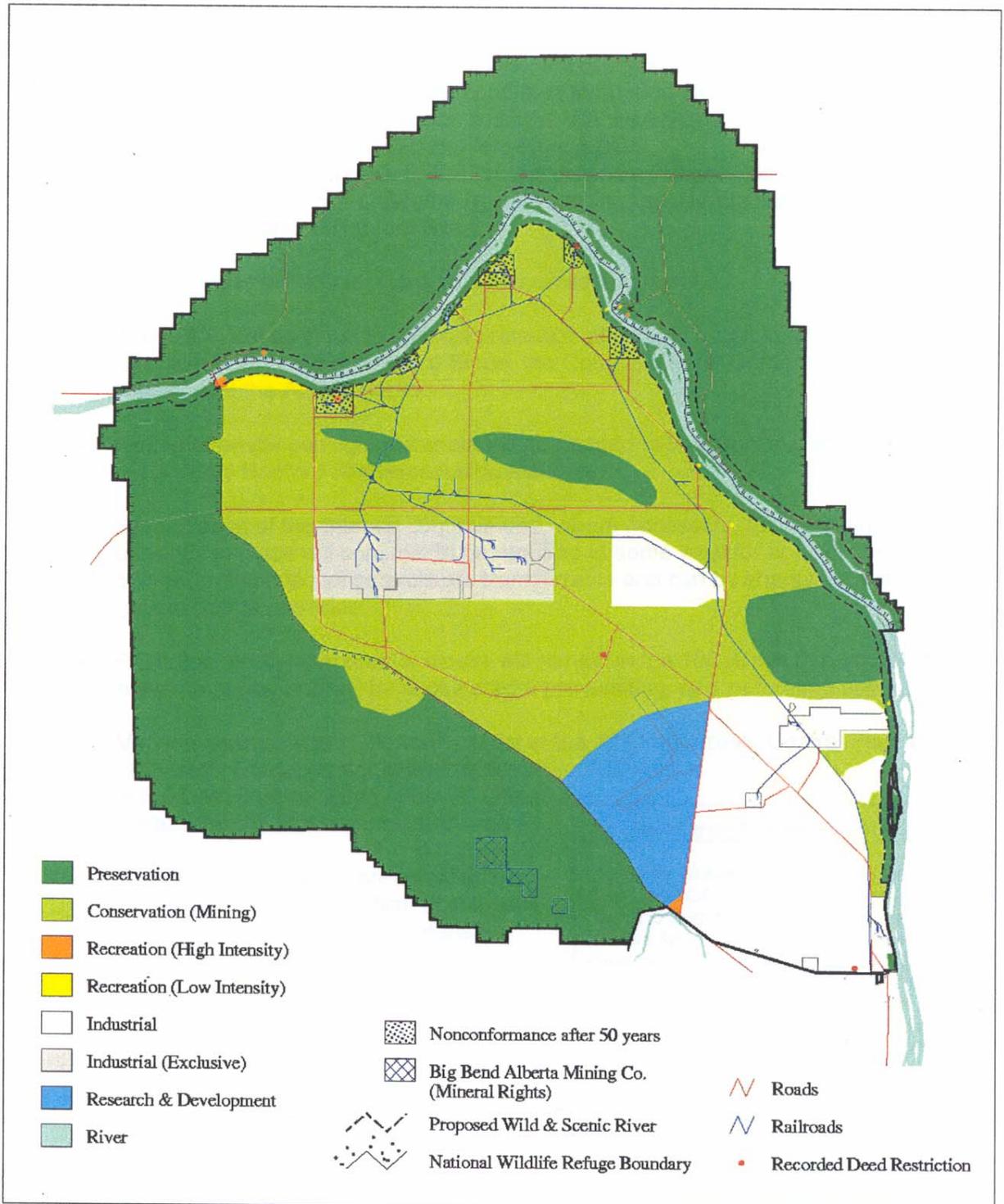
The DOE completed a Hanford Comprehensive Land-Use Plan EIS (HCP-EIS) during September 1999 (DOE 1999a), and a Record of Decision (ROD) was issued on November 2, 1999 (64 FR 61615). The purpose of this land-use plan and its implementing policies and procedures is to facilitate decision-making about the Hanford Site's uses and facilities over at least the next 50 years. The DOE Preferred Alternative addresses future and existing use. Proposed future uses include nine land-use designations defining permissible uses of the Hanford Site (Figure 4.6-4 and Table 4.6-7).

For analysis purposes the HCP-EIS used existing land use activities presented on a map that divided the Hanford Site into five geographical areas - Wahluke Slope, Columbia River Corridor, Central Plateau, All Other Areas of the Site, and the Fitzner-Eberhardt Arid Lands Ecology Reserve Unit (Figure 4.6-5).

The key features of the Hanford Site that formed the basis of analysis of the five geographic areas used in the environmental impact analysis and land-use plans were as follows:

- **The Wahluke Slope.** The area north of the Columbia River and the Hanford Site proper encompassed approximately 357 km² (138 mi²) and was designated as part of the Hanford Reach National Monument by President Clinton. This is an area of relatively undisturbed or recovering shrub-steppe habitat managed by the USFWS for the DOE. These lands consisted of two wildlife management units within the Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge: the 130 km² (50 mi²) Saddle Mountain Unit, and the 225 km² (87 mi²) Wahluke Unit. Portions of the Saddle Mountain Unit, which are closed to public access, still serve as buffer areas for the Hanford Site. The Wahluke Unit was open to public recreational access. A small strip of land approximately 1.62 km² (0.63 mi²) located between SR 243 and the Columbia River west of SR 24 is still managed by the Washington State Department of Fish and Wildlife under DOE permit and retains public access.
- **Columbia River Corridor.** The 111.6 km² (43.1 mi²) Columbia River Corridor was placed into the Hanford Reach National Monument by President Clinton. Adjacent to and running through the Hanford Site, it is used for boating, water skiing, fishing, and hunting of upland game birds and migratory waterfowl. Although public access is allowed on certain islands below the high water mark, access to other islands and adjacent areas is restricted because of distinctive habitats and the presence of cultural resources.

Along the southern shoreline of the Columbia River Corridor, the 100 Areas occupy approximately 68 km² (26 mi²). The facilities in the 100 Areas included nine retired plutonium production reactors, associated facilities, and structures. Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 6901 *et seq.*) closure permit restrictions have been placed in the vicinity of the 100-H Area, which is associated with the 183-H Solar Evaporation Basins and the



BHLrpp 04/23/98 clup/prefalt.aml Database: 25-AUG-1999

Figure 4.6-4. DOE's Preferred Alternative for Land Use on the Hanford Site, Washington (DOE 1999a)

Table 4.6-7 Definitions and Descriptions of DOE's Preferred Alternative Land Use Designations for the Hanford Site, Washington (DOE 1999a)

Land-Use Designation	Definition
Industrial-Exclusive	An area suitable and desirable for treatment, storage, and disposal of hazardous, dangerous, radioactive, and nonradioactive wastes. Includes related activities consistent with Industrial-Exclusive uses.
Industrial	An area suitable and desirable for activities such as reactor operations, rail, barge transport facilities, mining, manufacturing, food processing, assembly, warehouse, and distribution operations. Includes related activities consistent with Industrial uses.
Agricultural	An area designated for the tilling of soil, raising of crops and livestock, and horticulture for commercial purposes along with all those activities normally and routinely involved in horticulture and the production of crops and livestock. Includes related activities consistent with Agricultural uses.
Research and Development	An area designated for conducting basic or applied research that requires the use of a large-scale or isolated facility or smaller-scale time-limited research conducted in the field or in facilities that consume limited resources. Includes scientific, engineering, technology development, technology transfer, and technology deployment activities to meet regional and national needs. Includes related activities consistent with Research and Development.
High-Intensity Recreation	An area allocated for high-intensity, visitor-serving activities and facilities (commercial and governmental), such as golf courses, recreational vehicle parks, boat launching facilities, Tribal fishing facilities, destination resorts, cultural centers, and museums. Includes related activities consistent with High-Intensity Recreation.
Low-Intensity Recreation	An area allocated for low-intensity, visitor-serving activities and facilities, such as improved recreational trails, primitive boat launching facilities, and permitted campgrounds. Includes related activities consistent with Low-Intensity Recreation.
Conservation (Mining and Grazing)	An area reserved for the management and protection of archeological, cultural, ecological, and natural resources. Limited and managed mining (e.g. quarrying for sand, gravel, basalt, and topsoil for governmental purposes only), and grazing could occur as a special use (i.e. a permit would be required) within appropriate areas. Limited public access would be consistent with resource conservation. Includes activities related to Conservation (Mining and Grazing) consistent with the protection of archeological, cultural, ecological, and natural resources.
Conservation (Mining)	An area reserved for the management and protection of archeological, cultural, ecological, and natural resources. Limited and managed mining (e.g. quarrying for sand, gravel, basalt, and topsoil for governmental purposes only), and grazing could occur as a special use (i.e. a permit would be required) within appropriate areas. Limited public access would be consistent with resource conservation. Includes activities related to Conservation (Mining) consistent with the protection of archeological, cultural, ecological, and natural resources.
Preservation	An area managed for the preservation of archeological, cultural, ecological, and natural resources. No new consumptive uses (i.e. mining or extraction of non-renewable resources) would be allowed within this area. Limited public access would be consistent with resource conservation. Includes activities related to Preservation uses.

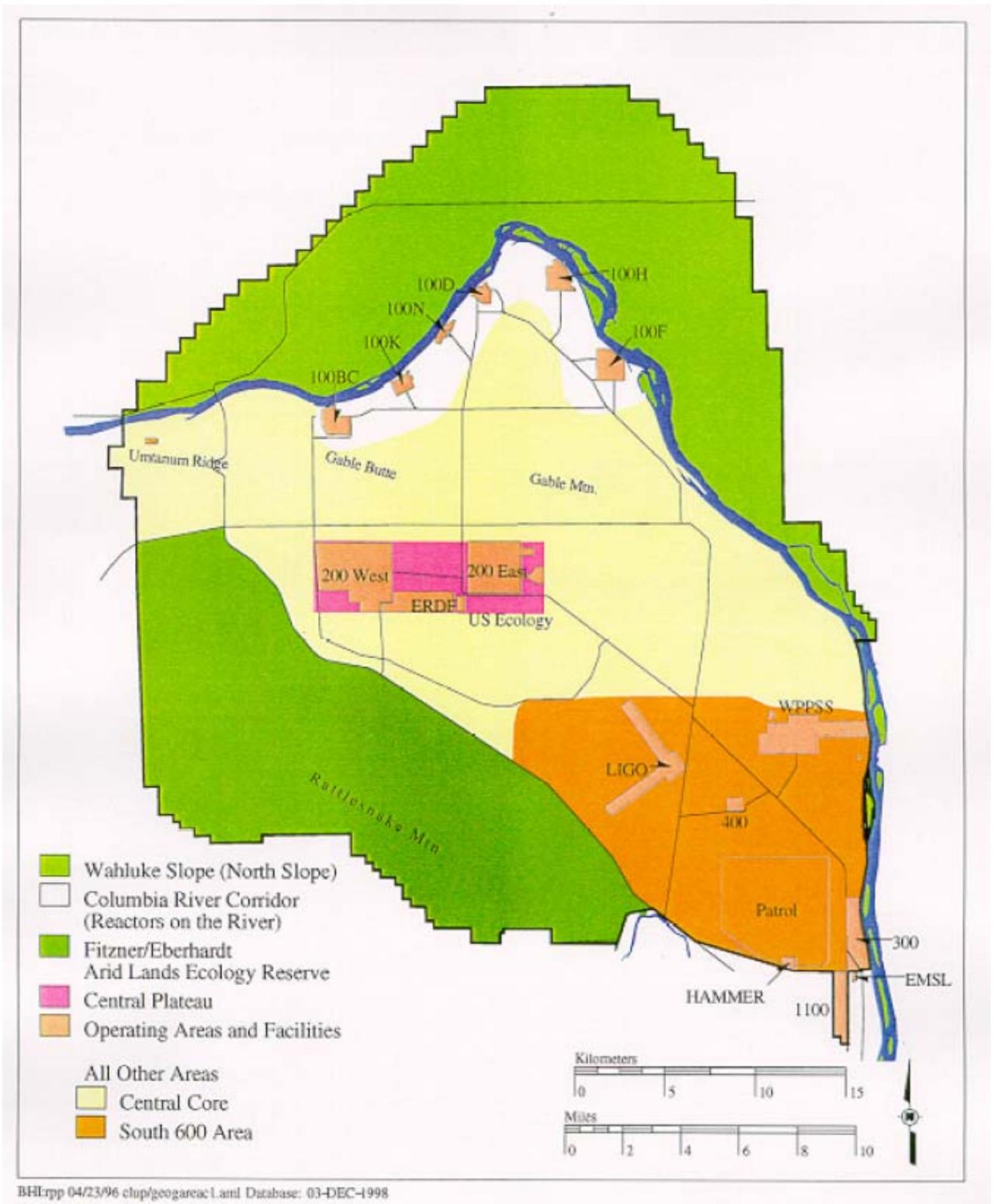


Figure 4.6-5. Geographic Study Areas for the Hanford Site, Washington (DOE 1999a)

N Reactor cribs. Additional deed restrictions or covenants for activities that potentially extend more than 4.6 m (15 ft) below ground surface are expected for the Comprehensive Environmental Restoration, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601, *et seq.*) remediation areas.

The area within the Columbia River Corridor known as the Hanford Reach includes a 402 m (1320 ft) strip of public land on either side of the Columbia River.

- **Central Plateau.** The 200 East and 200 West Areas occupy approximately 51 km² (19.5 mi²) in the Central Plateau of the Hanford Site. Facilities located in the Central Plateau were built to process irradiated fuel from the plutonium production reactors. The operation of these facilities resulted in the treatment, storage, disposal, and unplanned release of radioactive and nonradioactive waste. The Environmental Restoration Disposal Facility for CERCLA cleanup wastes is located in the Central Plateau as will be the Integrated Disposal Facility as authorized by the Hanford Solid Waste EIS ROD.

A commercial low-level radioactive waste disposal facility, licensed by the State of Washington and run by U.S. Ecology, Inc., currently operates on 0.4 km² (0.16 mi²) of the Central Plateau.

- **All Other Areas.** All Other Areas comprise 689 km² (266 mi²) and contain the 300, 400, and 1100 Areas, Energy Northwest facilities, and a section of land currently owned by the State of Washington for the disposal of hazardous substances.

The Hanford 1100 Area and the Hanford railroad southern connection (from Horn Rapids Road to Columbia Center) have been transferred from DOE ownership to Port of Benton ownership to support future economic development. Although the 1100 Area is no longer under DOE control, it was included in the HCP EIS to support the local governments with their State Environmental Policy Act (SEPA) EIS analyses of the Hanford sub-area of Benton County under the State of Washington's Growth Management Act.

The 300 Area is located just north of the city of Richland and covers 1.5 km² (0.6 mi²). The 300 Area is the site of former reactor fuel fabrication facilities and was also the principal location of nuclear research and development facilities serving the Hanford Site.

The 400 Area, located southeast of the 200 East Area, is the site primarily of the Fast Flux Test Facility (FFTF), a 400-megawatt (thermal) liquid metal (sodium) fast neutron flux nuclear test reactor. The construction of the FFTF was completed in 1978 and its initial operation began in 1980. From 1982 to 1992, the FFTF operated as a national research facility to test advanced nuclear fuels, materials, components, nuclear power plant operations and maintenance protocols, and reactor safety designs. During this time, the FFTF also produced a wide variety of medical and industrial isotopes, made tritium for the U.S. fusion research program, and conducted cooperative international research work. Since 2001, major FFTF deactivation activities underway at this time consist of, but are not limited to, dry cask storage of irradiated fuel, dry storage of unirradiated and sodium-bonded fuel, sodium drain and storage, and deactivation of the auxiliary plant systems.

Energy Northwest currently operates the Columbia Generating Station on leased land approximately 10 km (6 mi) north of Richland. Originally leased for the operation of three nuclear power plants, construction of two of the plants was halted; other industrial options are currently being considered.

During 1980, the federal government sold a 2.59 km² (1 mi²) section of land (known as Section 1) south of the 200 East Area, near SR 240, to the State of Washington for the purpose of nonradioactive hazardous waste disposal. To date, this parcel has not been used for hazardous waste disposal, and it is undeveloped and uncontaminated (although the underlying groundwater might be contaminated). The deed requires that if it were used for any purpose other than hazardous waste disposal, ownership would revert to the federal government.

Additional activities in All Other Areas include:

- *A specialized training center:* The Hazardous Materials Management and Emergency Response (HAMMER) Volpentest Training and Education Center is used to train hazardous materials response personnel and operating personnel for the Waste Treatment Plant. It is located north of the former 1100 Area and covers about 0.3 km² (0.12 mi²).
- *A regional law-enforcement training facility:* The Hanford Patrol Training Academy provides a range of training environments including classrooms, library resources, practice shoot houses, an exercise gym, and an obstacle course.
- *A national research facility:* The Laser Interferometer Gravitational Wave Observatory (LIGO), built by the National Science Foundation for scientific research, is designed to detect cosmic gravitational waves. The facility consists of two optical tube arms, each 4 km (2.5 mi) long, arrayed in an "L" shape, which are extremely sensitive to vibrations.
- *A national utilities training center:* The National Utility Training Services facility in Richland, Washington, will help continue to develop curriculum for the state-of-the-art training facility located adjacent to the Volpentest HAMMER Training Center for emergency workers at the U.S. Department of Energy's Hanford facility. National Utility Training Services is a facility designed to provide the best in electric utility hands-on, performance-based training. Originally a project of the Northwest Public Power Association (NWPPA), National Utility Training Services is now a non-profit educational 501(c)3 organization, and works in conjunction with NWPPA to provide hands-on performance-based training to the west's electric utility employees.
- *A national counter-drug center:* National Counternarcotics Center pilot. The drug interdiction prototype will support future interest and funding for a permanent multi-jurisdictional counternarcotics program involving federal and local agencies.
- **Fitzner-Eberhardt Arid Lands Ecology Reserve Unit.** The 308.7 km² (119.2 mi²) Fitzner-Eberhardt Arid Lands Ecology Reserve Unit is part of the Hanford Reach National Monument and is managed by the USFWS for the DOE. The Unit is located in the southwestern portion of the Hanford Site and is managed as a wildlife reserve. The public is currently restricted from the site.

The Hanford Site facilities and activities are consolidated within operating areas that occupy about 6 percent of the total available area of the Site (DOE 1999a). Some of the Hanford Site that is not involved with the current mission has been leased, disposed, or permitted to federal or state agencies, or private entities (Table 4.6-8).

Table 4.6-8. Key Areas of the Hanford Site, Washington, Outgranted/Released to Date ^(a)

Area	Management	Use	Year	Controls
US Ecology Low-Level Radioactive Waste Disposal Facility	State of Washington	Commercial Radioactive Waste Disposal	1964	Leased
Vernita Rest Area ^(b)	Washington State Department of Transportation	Highway Rest Area	1966	Washington State Highway Patrol
Columbia Generating Station	Energy Northwest	Power Production	1971	Leased
West End of Wahluke Slope (Saddle Mountain National Wildlife Refuge) ^(b) (Superseded)	U.S. Fish and Wildlife Service	Wildlife Refuge	1971	Permitted with the following controls: <ul style="list-style-type: none"> • No overnight camping • Access control plans required • No drilling of wells for residential water
East End of Wahluke Slope ^(b) (Superseded)	WA State Department of Fish and Wildlife	Wildlife & Recreational Reserve	1971-1999	Permitted with same controls as mentioned for Wahluke Slope above.
Township 11 Range 26, Section 1	State of Washington	Hazardous Waste Disposal	1980	Disposed (Title Transfer)
3000 Area	Port of Benton	Economic Development	1996	Disposed (Title Transfer)
Fitzner-Eberhardt Arid Lands Ecology Reserve Unit ^(b)	U.S. Fish and Wildlife Service	Wildlife Reserve	1998	Permitted with same controls as mentioned for Wahluke Slope above.
Laser Interferometer Gravitational Wave Observatory (LIGO)	The National Science Foundation	Research	1998	Permitted
1100 Area	Port of Benton	Economic Development	1998	Disposed (Title Transfer)
Wahluke Slope ^(b) (Remainder/all)	U.S. Fish and Wildlife Service	Wildlife Refuge	1999	Permitted with same controls as mentioned for Wahluke Slope above.
(a) Does not include release of lands within the Richland City, lease of the City itself, leased facilities on the Hanford Site, or lands released before 1964.				
(b) Included in Hanford Reach National Monument, established June 9, 2000 (65 FR 37253).				

4.6.13 Visual Resources

With the exception of Rattlesnake Mountain, the land near the Hanford Site is generally flat with little relief. Rattlesnake Mountain, rising to 1060 m (3477 ft) above mean sea level forms the western boundary of the Hanford Site, and Gable Mountain and Gable Butte are the highest landforms within the Site (Figure 4.6-6). The view toward Rattlesnake Mountain is visually pleasing, especially during the

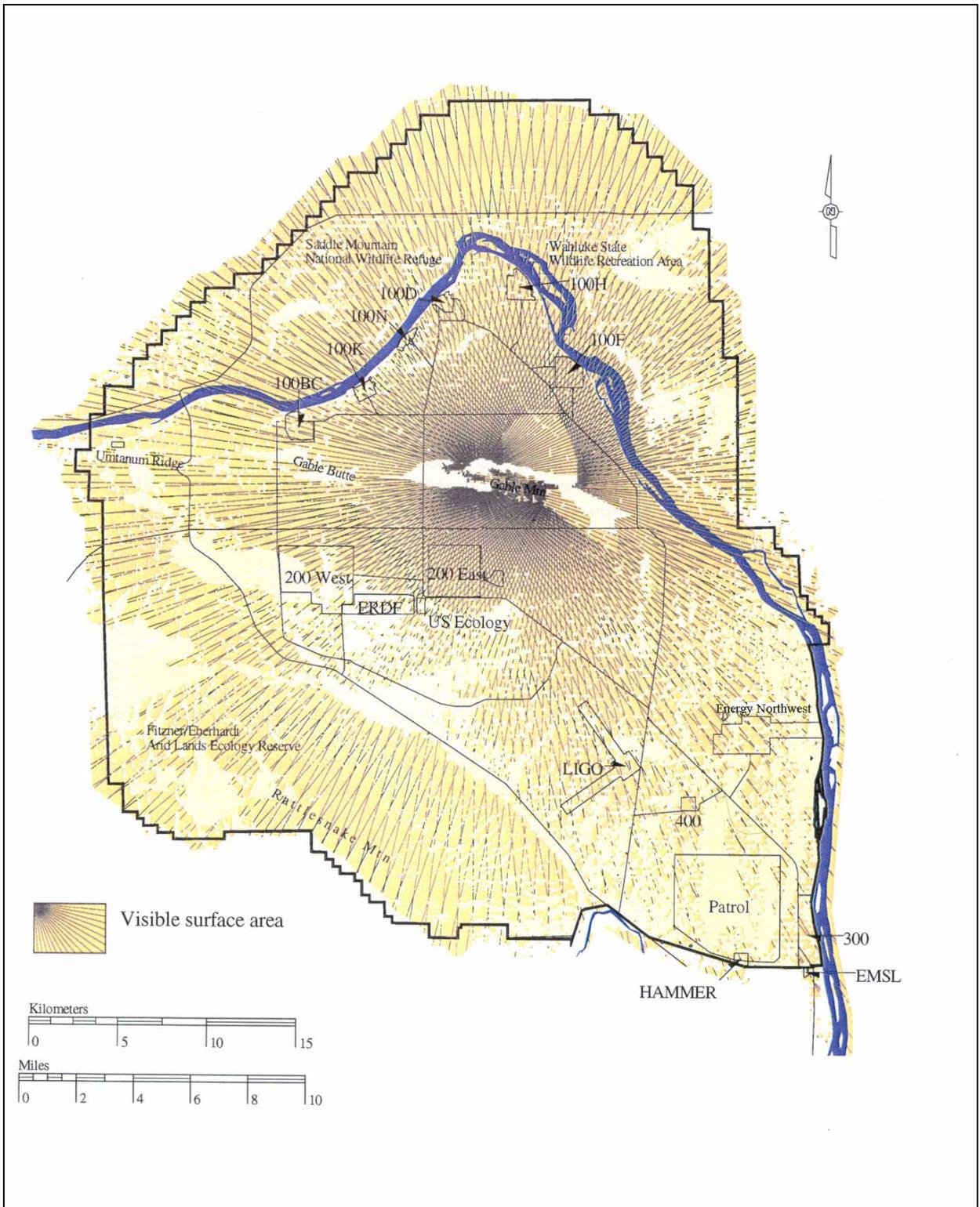


Figure 4.6-6. Viewshed from Gable Mountain on the Hanford Site, Washington (modified from DOE 1999a)

springtime when wildflowers are in bloom. Large rolling hills are located to the west and far north. The Columbia River, flowing across the northern part of the Hanford Site and forming the eastern boundary, is generally considered scenic, with its contrasting blue against a background of brown basaltic rocks and sagebrush (DOE 1999a). The White Bluffs, steep whitish-brown bluffs adjacent to the Columbia River and above the northern boundary of the river in this region, are a major feature of the landscape.

Traditional Native American religion is manifest in the earth, water, sky, and all animate or inanimate beings that inhabit a given location. The National Historic Preservation Act (16 USC 470, *et seq.*), the Native American Graves Protection and Repatriation Act (25 USC 3001, *et seq.*), the Archaeological Resources Protection Act (16 USC 470aa, *et seq.*), and DOE's American Indian Policy (DOE 1992b), among other legislation and guidelines, all require the identification and protection of areas and resources of concern to Native Americans. The acquisition of spiritual guidance and assistance through personal vision quests is a religious practice of the Native Americans that lived near the Hanford Site. High spots were selected as sacred sites in part because they afforded extensive views of the landscape and seclusion for meditation, and the Gable Butte Block Survey in 2001 determined that Gable Butte and Gable Mountain likely were used for vision quests (Hale and Harvey 2002). Many Hanford facilities that clearly are not part of the "natural" landscape are easily seen from these sites.