



US Army Corps  
of Engineers®  
Walla Walla District

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# Report of the Secretary of the Army on Civil works Activities for Fiscal Year 2004



Department of the Army Corps of Engineers  
Extract Report of Walla Walla District

# WALLA WALLA, WA, DISTRICT

This U.S. Army Corps of Engineers (Corps), Walla Walla District (District), consists of all Columbia River drainage and tributaries thereto between the head of the McNary Reservoir (Lake Wallula) (river mile 345.4) and Umatilla Bridge (river mile 290.5) below McNary Lock and Dam,

except the Yakima River Basin above the Van Giesen Street Bridge (river mile 8.4) near Richland, WA. The primary tributary drainage area is the Snake River that includes more than 107,000 square miles in six states: Washington, Oregon, Idaho, Wyoming, and small portions of Nevada and Utah.

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## Flood Control

### 1. COLUMBIA RIVER BASIN, LOCAL FLOOD PROTECTION PROJECTS

**Location.** Improvements included in this project are along the Columbia River and its tributaries.

**Existing project.** The Flood Control Act of 1950 approved a general comprehensive plan for the Columbia River Basin for flood control and other purposes based on plans in H. Doc. 531, 81st Congress, 2nd Session, and authorized \$75 million to be appropriated for partial accomplishment of certain projects. From that authorization, an amount (not to exceed \$15 million) was allotted for construction of local flood protection works throughout the Columbia River Basin, subject to conditions that all work undertaken pursuant to authorization would be economically justified prior to construction, and local cooperation specified in the Flood Control Act of 1936, as amended, should be required.

**Local cooperation.** Section 3, Flood Control Act of June 22, 1936, applies.

**Operations during the fiscal year (FY).** No projects were deauthorized.

### 2. INSPECTION OF COMPLETED FLOOD CONTROL PROJECTS

Federal law requires local interests to maintain and operate completed local protection projects in accordance with regulations prescribed by the Secretary of the Army. Inspections were made to determine the extent of compliance and advise local interests, as necessary, of measures required to correct deficiencies.

The FY costs were \$55,385. Total costs through September 30, 2004, were \$3,218,498.

### 3. JACKSON HOLE, WY

**Location.** This project is located on the banks of the Snake River, Teton County, west of Jackson, WY.

**Existing project.** On the Snake River, approximately 23.5 miles of Federally-constructed levees consist of the following: (1) On the right bank: a series of levees, off-set levees, and bank protection structures, all with full riprap protection

from 10 miles upstream of the Jackson-Wilson Bridge to 3.5 miles below the bridge for a total of 13.5 miles; and (2) On the left bank: a series of Federally-constructed levees and bank protection structures, all with full riprap protection, extending from 10 miles upstream of the Jackson-Wilson Bridge to 5 miles upstream. The project resumes 1.5 miles immediately upstream of the same bridge and continues to 3.5 miles below the bridge for a total of 10 miles. In addition, a series of Federal and non-Federal constructed levees, with a total length of approximately 5 miles, most having some or full riprap protection, are interspersed along both banks of the Snake River from Highway 26 Bridge to 4 miles downstream of the Jackson-Wilson Bridge.

The project also includes riprap-protected levees on the left and right banks of the Gros Ventre River. The left bank levee begins 1.5 miles west of Cattlemen's Bridge and extends 0.5 mile east of the same bridge. The right bank levee begins 0.5 mile west of Cattlemen's Bridge and extends 0.3 mile east of the same bridge.

The Project is authorized by Public Law (PL) 81-516, Flood Control Act of 1950, for flood control protection by channel improvements consisting of channel rectification, levees, and revetments along the Snake River in the vicinity of Wilson, WY. The PL 104-303 modified the original PL 81-516 to ensure the operation, maintenance, modifications, and additions to the project become Federal responsibility.

**Local cooperation.** Non-Federal sponsors pay the initial \$35,000 in cash or materials of any such costs expended in any 1 year, plus inflation as of the date of enactment of the Water Resources Development Act of 1986.

Since 1978, \$86,885,000 (adjusted to October 2004 price index) in potential flood damages has been prevented by the levees.

**Operations during FY.** Teton County, under their Local Cooperative Agreement, worked with the Corps performing levee maintenance. The FY costs were \$335,979. (See table 30-A, Cost and Financial Statement.)

**New Project.** The Water Resources Development Act of 2000 authorized the Upper Snake River Restoration Project. Congress added new start funding to the FY 03 budget. The project is located in and along a 22-mile stretch of the Upper

Snake River near Jackson, WY, in Teton County. It is partially in and adjacent to Grand Teton National Park, the National Elk Refuge, and in close proximity to Yellowstone National Park. The project will restore fish and wildlife habitat that was lost as a result of construction, operation, and maintenance of levees constructed by Federal and non-Federal interests. Restoration measures include eco-fences, channel capacity excavation, spur dikes, anchored rootwads, rock grade control, and secondary channels, off-channel and channel stabilization pools. The project has a 14-year phased construction schedule and includes continuing construction, adaptive management, and monitoring to provide implementation flexibility. The FY 03 activities closed out the pre-construction engineering and design phase; prepared non-standard project cooperation agreement submittal package for Headquarters review; and completed biddability, constructability, operability, and environmental review of contract plans and specifications for Site 9. The FY 04 Construction General costs were \$75,000.

#### 4. LUCKY PEAK LAKE, ID

**Location.** This project is located on the Boise River in southwestern Idaho about 10 miles southeast of the city of Boise, ID. (See table 30-B for Authorizing Legislation of projects in the District).

**Existing project.** The project includes a rolled earthfill dam about 250 feet above the streambed and 1,700 feet long at the crest, with a lake providing a total storage at upper operating lake level of 306,000 acre-feet. The project provides for flood control, irrigation, and recreation.

Construction of the existing project was initiated in November 1949 and completed in June 1961. Since 1961, \$596,218,000 (adjusted to October 2004 price index) in potential flood damages has been prevented by the project.

During a detailed study of outlet capacity and potential for adding hydropower to the existing project, a need for an auxiliary outlet became apparent. Construction of an auxiliary outlet was authorized in the Water Resource Development Act of 1976. In FY 78, an *Interim Feasibility Report on Modification of Lucky Peak Dam and Lake* (power facilities) was submitted to the Board of Engineers for Rivers and Harbors and approved. States, agencies, and the Chief of Engineers commented on the report to the Secretary of the Army. The report

was forwarded to the Office of Management and Budget in February 1982.

A license to construct and operate power facilities at the project was issued by the Federal Energy Regulatory Commission (FERC) (Project #2832) to the Boise Project Board of Control on June 10, 1980, and modified on October 9, 1980, and in 1982. Construction of the auxiliary outlet facility began in May 1984 and was completed in August 1986. Construction of modifications to the existing outlet tunnel and powerhouse excavation began in August 1986 and was completed January 1987. Powerhouse general contract construction began in April 1986. The project was completed and dedicated on October 7, 1988. Power on-line for all units was initiated on August 18, 1988. A Federally-authorized second outlet was deauthorized in FY 90.

Recreation facilities at Lucky Peak Lake consist of 20 picnic/day-use areas, 4 boat launch ramps, and 3 swimming areas. The FY visitation to Lucky Peak Lake was 1,129,598.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: Normal operation and maintenance, which included the dam structures and recreation areas, continued. The FY costs were \$1,572,487. (See table 30-A, Cost and Financial Statement.)

#### 5. MILL CREEK, BENNINGTON LAKE, WA

**Location.** This project is located in and upstream from Walla Walla, WA, on Mill Creek, a tributary of the Walla Walla River.

**Existing project.** The project includes an off-stream earthfill storage dam, about 125 feet above the streambed and 3,200 feet long at the crest, two concrete-lined outlet channels, an earthfill diversion dam, and diversion structures. The project provides for flood control and recreation. Authorizing legislation to provide a channel through the city of Walla Walla was added to the project in 1941. Recreation was added to the project purposes through the Federal Water Project Recreation Act of 1965.

Construction of the dam and appurtenant works was completed in 1942. Paving of the channel through the city of Walla Walla was completed in 1966. Since 1942, \$61,326,000 (adjusted to October 2004 price index) in potential flood damages has

been prevented by the combined storage and channel operation.

Rehabilitation of the existing project was initiated in FY 78 and completed in FY 79. The plan of rehabilitation included action to correct the seepage and internal erosion that has occurred during each subsequent filling of the reservoir. A cutoff wall was constructed but did not alleviate the seepage problem, thus requiring limited flood control use of the project. The seepage and internal erosion create a high vulnerability for dam failure.

Mill Creek/Bennington Lake offers visitors three day-use/picnic areas and one boat launch ramp. Visitation to Mill Creek/Bennington Lake for the FY was 199,798.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: Normal operation and maintenance continued, which included regulation of water control structures and care of recreation areas. The right abutment test grouting contract was initiated. The FY costs were \$794,416. (See table 30-A, Cost and Financial Statement.)

**6. SCHEDULING FLOOD CONTROL RESERVOIR OPERATIONS**

Functional regulation of non-Corps projects was accomplished under several authorities. Regulation was accomplished as authorized under Section 7, Flood Control Act of 1944, and coordinated with the Bureau of Reclamation for Palisades, Little Wood, and Anderson Ranch Reservoirs, ID; and Bully Creek, Warm Springs, Agency Valley, and Mason Reservoirs, OR.

Flood control operations at Jackson Lake, WY, Arrowrock Reservoir and Lake Lowell, ID, were in accordance with formal agreements with the Bureau of Reclamation. Flood control regulation was accomplished under informal agreements for the Owyhee Reservoir, OR; and American Falls, Magic, Mackay, Cascade, and Deadwood Reservoirs, ID. Brownlee and Oxbow Reservoirs, OR, and Hells Canyon Reservoir, OR and ID, provided flood control regulation in accordance with provisions of the Federal Power Commission license to Idaho Power Company. The FY costs were \$309,988.

**Multiple-Purpose Projects, Including Power**

**7. COLUMBIA RIVER FISH MITIGATION PROGRAM (WALLA WALLA PROJECTS), OR, WA, AND ID**

**Location.** This project is located at Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Locks and Dams on the lower Snake River in the State of Washington and McNary Lock and Dam on the Columbia River in the states of Oregon and Washington.

**Existing project.** The eight Corps hydroelectric projects on the Columbia and lower Snake Rivers have been identified as a major contributing factor in causing mortality to downstream migrating juvenile salmon and steelhead. Without adequate bypass facilities to guide these juvenile fish away from the power turbines at the dams, mortalities incurred through project passage severely impact the commercial, recreational, and Indian fisheries. The Corps has recognized the need to reduce juvenile fish mortality and has undertaken bypass measures that include mechanized fish bypass systems with barge and truck transportation. Spill as an additional bypass route over the spillways has been used to divert fish from entering turbine units, but it is a significant adverse economic factor due to lost power revenues. Congress passed, and the President signed, the FY 89 Energy and Water Development Appropriation Act (PL 100-371), which mandated the expenditure of funds for the design, testing, and construction of new or improved fish bypass facilities for the Columbia River fish mitigation projects. Completion of bypass and transportation facilities will significantly increase the survival of migrating downstream juvenile fish. The mitigation study will determine the overall scope of the fish mitigation facilities for these Columbia and lower Snake River dams. The mitigation study project was added to the President's FY 91 budget.

The plan of improvement includes the following facilities: (1) Ice Harbor Lock and Dam: screens, new gantry crane, collection bypass facility, intake gate raise, spillway deflectors, surface bypass, and fish ladder temperature control; (2) Lower Monumental Lock and Dam: hold/load and collection bypass facility, screens, passive integrated transponder tag (PIT-Tag) facility, barge load facility modifications, barges, gate raise modifications, gantry crane, fish ladder temperature control, and

surface bypass; (3) Little Goose Lock and Dam: screens, gantry crane modification, collection bypass facility, outfall pipe, fish ladder temperature control, fallout fences, gate raise, deck screen modifications, PIT-Tag facility, and surface bypass; (4) Lower Granite Lock and Dam: juvenile fish facility, gantry crane, gate raise, outfall pipe, fish barges, screens, additional moorage facility, fish slot closures, juvenile fish facility improvements, barge exit modifications, deck screen modifications, fish ladder temperature control, surface bypass, PIT-Tag facility, and fallout fences; and (5) McNary Lock and Dam: gantry crane, screens, hold/load facility, gate raise modifications, tilted weirs fish ladder, maintenance facility, fish ladder exits, hold/load facility, adult/juvenile collection channel stoplogs, juvenile fish facility, surface bypass, and gantry crane modifications.

In response to the 1995 *Endangered Species Act, Section 7 Consultation Biological Opinion* issued by the National Marine Fisheries Service (NMFS), the District conducted a feasibility study (Lower Snake River Juvenile Salmon Migration Feasibility Study) to evaluate salmon migration problems on the lower Snake River. The objective of the study was to improve salmon migration conditions through the four Corps-operated dams and reservoirs on the lower Snake River. The study focused on how these dams could be changed to improve survival and recovery prospects for Snake River salmon stocks under the Endangered Species Act. The total completed cost of the study was \$31.1 million.

The District is currently managing a surface bypass and collection technology development effort that focuses on improving juvenile fish passage for endangered and threatened salmon migration past all Corps hydroelectric projects on the Columbia and lower Snake Rivers. It is an aggressive, nontraditional approach to prototype development that involves fast-track design, construction, testing, and evaluation.

The fully funded Federal project cost is estimated at \$682,700,000 for District projects.

**Local cooperation.** None required.

**Operations during FY.** The following improvements and studies were accomplished during FY 04:

- Continued construction on the Ice Harbor Lock and Dam fish ladder emergency auxiliary water supply contract. The purpose is to upgrade and isolate existing pump systems, modify diffusers to allow more flow, and install cranes for access and maintenance upgrade.
- Continued construction on the Lower Granite Lock and Dam fish ladder emergency auxiliary water supply contract. The purpose is to upgrade and isolate existing pump systems, modify diffusers to allow more flow, and install cranes for access and maintenance upgrade.
- Completed third year prototype tests of the Removable Spillway Weir (RSW) at Lower Granite Lock and Dam. The purpose of the tests is to determine the overall efficiency of the RSW.
- Completed fourth year of the Juvenile Salmon Spillway Survival Study at Ice Harbor Lock and Dam. Survival studies are being conducted for indication of levels of survival. Spill levels, patterns, and spill duration to provide the best conditions for smolts must be balanced with the negative impacts of high spill on adult salmon passage, fallback, and water quality.
- Initiated construction of RSW at Ice Harbor Lock and Dam. The RSW, in combination with basin and deflector modifications should improve spillway passage conditions and efficiencies.
- Completed modifications to the adult PIT-Tag detection facilities at Ice Harbor Lock and Dam and Lower Granite Lock and Dam.
- Initiated construction of spillway gate rehabilitation at McNary Lock and Dam. The gates need repair due to years of use.
- Continued monitoring of forebay temperature at McNary Lock and Dam. During the summer months, water temperature in the McNary forebay, gatewells, and fish collection channel is sometimes deleterious to fish survival and health.
- Initiated design of the North Shore Fish Ladder antennas of McNary Lock and Dam. Improvements are required to better account for the fish in the ladder.

- Initiated modifications to the extended submerged bar screens at Lower Granite and Little Goose Locks and Dams. Modifications are required due to the interaction of dissimilar metals.
- Initiated and completed design of Lower Monumental Lock and Dam fish barge loading improvements. Construction to be complete in FY 05.
- Initiated and completed design of Lower Monumental Lock and Dam parapet wall. The wall was required to prevent fish from jumping onto the powerhouse deck.
- Completed fish separator evaluation studies. Will remove test separator in FY 05.
- Completed second year of Juvenile Salmon Spillway Survival Study at Lower Monumental Lock and Dam. Fish survival information is extremely limited. Survival of fish that pass via spillway, turbines, and bypass system is largely unknown. It is imperative to collect data, estimate survival, and make improvements necessary to improve fish survival.

Several mitigation studies continued throughout FY 04, including the Turbine Survival Study and the Fish Ladder Transition Pool Evaluation. Many multi-year research studies were also conducted, including Multiple Bypass Evaluation, Delayed Mortality Evaluation, Temperature Impacts on Adults, and Estuary PIT-Tag Recovery.

The FY costs were \$25,488,956. Total project costs are \$484,889,000. (See table 30-A, Cost and Financial Statement.)

**8. DWORSHAK DAM AND RESERVOIR, ID**

**Location.** The dam is on the North Fork of the Clearwater River, 1.9 miles above its junction with the Clearwater River, near Orofino, ID, and about 35 miles east of Lewiston, ID.

**Existing project.** The project includes a dam, powerplant, public parks, and appurtenant facilities. The project provides for flood control, navigation, hydroelectric power generation, recreation, and area redevelopment. The reservoir has a normal operating range between the elevations of 1,600 and 1,445

mean sea level (msl). The reservoir has a gross storage capacity of 3,468,000 acre-feet (2 million acre-feet of which are effective for both local and regional flood control and for at-site and downstream power generation). In addition, the reservoir, which extends 59 miles into rugged and relatively inaccessible timberland, provided cost-effective transportation for moving marketable logs. The reservoir provides habitat for elk, deer, and other wildlife. The dam structure is about 3,287 feet long and about 717 feet above the streambed. Fish passage is not feasible due to the height of the dam. A hatchery has been built below the dam to assure continuance of anadromous fish runs. The powerhouse has two 90,000-kilowatt (kW) and one 220,000-kW generating units in operation for a capacity of 400,000 kW. Provisions had been made for three additional 220,000-kW generating units for an ultimate installed capacity of 1,060,000 kW.

A reconnaissance report justifying the feasibility and cost benefits for the addition of a fourth 200,000-kW generating unit was completed in FY 78. However, environmental and economic studies on additional generating units have been curtailed due to public opposition. Unit 4 is undeveloped. Units 5 and 6 were deauthorized in FY 90, and Unit 4 was deauthorized in FY 95. Principal project data are set forth in table 30-C.

Construction of the project began in July 1966. It was placed in operation in 1972 and completed in 1986. Since the project became operational in June 1972, it has prevented about \$2,836,000 (adjusted to October 2004 price index) in potential flood damages. Power generation through September 2004 was 53.09 billion kW hours.

At Dworshak Reservoir, recreation facilities consist of 12 day-use/picnic areas, 6 camp areas, 6 boats launches, and 2 swim areas. Total visitation to Dworshak Reservoir for the FY was 117,437.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: Management of wildlife habitat browse continued on project lands to provide winter browse for elk and deer. A paving contract was completed at recreation areas. During the FY, 1.69 billion kW hours of electrical power were generated by the three generating units. The FY costs were \$8,421,941. (See table 30-A, Cost and Financial Statement.)

**9. ICE HARBOR LOCK AND DAM, LAKE SACAJAWEA, WA**

**Location.** This dam is located on the Snake River, 9.7 miles above the river mouth at the head of Lake Wallula (McNary Reservoir) and 12 miles east of Pasco, WA.

**Existing project.** The project includes a dam, powerplant, navigation lock, two fish ladders, recreation areas, and appurtenant facilities. The project provides navigation, hydroelectric power generation, recreation, and incidental irrigation. The reservoir has a normal operating range between elevations 440 and 435 msl. Lake Sacajawea extends upstream about 31.9 miles and provides slack water to Lower Monumental Lock and Dam. The dam structure is approximately 2,822 feet long and approximately 130 feet above the streambed. The fish passage facilities include two fish ladders. The powerhouse has three 90,000-kW units and three 111,000-kW generating units in operation for a capacity of 603,000 kW.

The spillway dam is 590 feet long, and the overflow crest at elevation 391 msl is surmounted by 10 tainter gates, 50 feet wide and 52.9 feet high, that provide the capacity to pass a design flood of 850,000 cubic feet per second (cfs). The deck is at elevation 453 msl and provides a service road and track for a gantry crane. The navigation lock is a single-lift type with clear plan dimensions of 86 by 675 feet and a 16-foot minimum depth over the sills. A navigation channel 250 feet wide, 14 feet deep, and 41.6 miles long is provided from the mouth of the Snake River to the dam and from the dam to Lower Monumental Lock and Dam. Principal data are set forth in table 30-C.

Construction of the original project began in December 1955. It was placed in operation in 1961 and completed in 1971. Construction of the additional generating units was started in 1971 and completed in 1981. Power generation through September 2004 was 89.28 billion kW hours.

Recreation areas on Lake Sacajawea include 11 picnic/day-use sites, 4 camping areas, 7 areas with boat launching, and 4 swimming areas. Total visitation on Lake Sacajawea for the FY was 355,634.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: During the FY, 1.67 billion kW hours of electrical power were generated by the six generating units. Traffic through the navigation lock consisted of grains, petroleum products, fertilizer, wood products, and miscellaneous cargo and amounted to 3,714,800 tons during calendar year 2004. The FY costs were \$8,726,044. (See table 30-A, Cost and Financial Statement.)

**10. LITTLE GOOSE LOCK AND DAM, LAKE BRYAN, WA**

**Location.** The dam is 70.3 miles above the mouth of the Snake River and at the head of Lake Herbert G. West (Lower Monumental Reservoir), about 40 miles northerly of Walla Walla, WA, and 50 miles westerly of Lewiston, ID.

**Existing project.** The project includes a dam, powerplant, navigation lock, fish ladder, and appurtenant facilities. The project provides for navigation, hydroelectric power generation, recreation, and incidental irrigation. The reservoir has a normal operating range between elevations 638 and 633 msl. Lake Bryan extends upstream about 37.2 miles and provides slack water to Lower Granite Lock and Dam. The dam structure is 2,655 feet long and approximately 165 feet above the streambed. Fish passage facilities include one ladder with entrances on both shores and a fish channel through the spillway, which connects to the powerhouse fish collection system and south shore ladder. The powerhouse has six 135,000-kW generating units in operation for a capacity of 810,000 kW. The spillway dam is 512 feet long, and the overflow crest at elevation 581 msl is surmounted by eight tainter gates, 50 feet wide and 60 feet high, that provide the capacity to pass a design flood of 850,000 cfs. The navigation lock is a single-lift type with clear plan dimensions of 86 by 668 feet and a 15-foot minimum depth over the sills. A navigation channel 250 feet wide, 14 feet deep, and 37.2 miles long is provided from the dam to Lower Granite Lock and Dam. Relocations along the lake included 32 miles of Camas Prairie Railroad, 6.8 miles of county roads, 2.2 miles of state highways, and the Central Ferry Bridge. Principal project data are set forth in table 30-C.

Construction of the original project began in 1963. It was placed in operation in 1970 and completed in 1976. Construction of additional generating units started in 1974 and was completed



in 1984. Power generation through September 2004 was 84.39 billion kW hours.

Lake Bryan provides seven day-use sites, five campgrounds, five boat launching areas, and two swimming areas. Total FY visitation was 195,032 for Lake Bryan.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: During the FY, 2.16 billion kW hours of electrical power were generated by the six generating units. Traffic through the navigation lock consisted of grains, petroleum products, fertilizer, wood products, and miscellaneous cargo and amounted to 2,806,500 tons during calendar year 2004. The FY costs were \$5,978,700. (See table 30-A, Cost and Financial Statement.)

#### **11. LOWER GRANITE LOCK AND DAM, LOWER GRANITE LAKE, WA**

**Location.** This dam is at river mile 107.5 on the Snake River at the head of Lake Bryan (Little Goose Reservoir) and about 33 miles downstream from Lewiston, ID.

**Existing project.** The project includes a dam, powerplant, navigation lock, fish ladder, appurtenant facilities, and includes approximately 8 miles of slack water levees along the Snake and Clearwater Rivers at Lewiston, ID. The project provides for slack water navigation, hydroelectric power generation, recreation, and incidental irrigation. The reservoir has a normal operating range between elevations 738 and 733 msl in Lewiston, ID, and Clarkston, WA. Lower Granite Lake extends upstream approximately 38 miles and provides slack water to the confluence of the Snake and Clearwater Rivers. The dam structure is approximately 3,200 feet long and approximately 146 feet above the streambed. Fish passage facilities include one ladder with entrances on both shores with a fish channel through the spillway that connects to the powerhouse fish collection system and south shore ladder. The powerhouse has six 135,000-kW generating units in operation for a capacity of 810,000 kW. The spillway dam is 512 feet long, and the overflow crest at elevation 681 msl is surmounted by eight tainter gates, 50 feet wide and 60 feet high, which provide the capacity to pass a design flood of 850,000 cfs. The navigation lock is single-lift type with clear plan dimensions of 86 by 674 feet and 15-foot minimum depth over the sills. A navigation channel 250 feet

wide, 14 feet deep, and 39.3 miles long is provided from the dam to the confluence of the Snake and Clearwater Rivers. Principal data are set forth in table 30-C.

Construction of the original project started in July 1965. It was placed in operation in 1975 and completed in 1984. Construction of additional generating units was started in 1974 and completed in 1979. Power generation through September 2004 was 75.63 billion kW hours. Approximately \$19,848,000 (adjusted to October 2004 price index) in potential flood damages has been prevented since the levees became functional.

Lower Granite Lake offers visitors 16 day-use/picnic sites, 6 sites with camping, 12 boat launch ramps, and 4 swimming areas. Total recreation visitation to Lower Granite Lake for the FY was 1,111,689.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: During the FY, 2.15 billion kW hours of electrical power were generated by the six generating units. Traffic through the navigation lock consisted of grains, petroleum products, fertilizer, wood products, and miscellaneous cargo and amounted to 1,673,100 tons during calendar year 2004. The FY costs were \$8,554,949. (See table 30-A, Cost and Financial Statement.)

**Juvenile Fish Transportation Program.** As the first collector dam on the Snake River, Lower Granite is a primary component of the Juvenile Fish Transportation Program. Transport began in the late 1960s as a research program on how to bypass juvenile salmon and steelhead around dams and reservoirs of the Corps' Snake and Columbia River dams. Transport became an operational program in 1981 with collection and transport from Lower Granite, Little Goose, and McNary Locks and Dams. Transport was expanded in 1993 to include Lower Monumental Lock and Dam. Development and improvement of collection and bypass systems continues with a new collection system completed at McNary Lock and Dam in 1994; a new bypass system completed at Ice Harbor Lock and Dam in 1996; and extended-length submersible bar screens installed at Lower Granite, Little Goose, and McNary Locks and Dams in 1996 and 1997. In addition, a new RSW was tested at Lower Granite Lock and Dam in 2003.

The 2004 juvenile fish transport season was marked by river flows well below average, lower than river conditions noted in 2003. Normal river operations continued in 2004, although project spills for juvenile fish were severely curtailed as anticipated average spring runoff fell below 85 kcfs as per the 2000 *Endangered Species Act Section 7 Supplemental Biological Opinion* issued by NMFS. Testing of the RSW at Lower Granite Lock and Dam in 2004 was limited due to low flows. Emphasis in 2004 was placed on maximizing fish collection for transportation.

Juvenile fish collection at Lower Granite Lock and Dam was 11,787,536 compared with 6,184,228 in 2003 and 4,001,025 in 2002. A total of 498,367 fish were bypassed back to the river in 2004 and 11,253,834 were transported. At Little Goose Lock and Dam, a total of 5,067,503 juvenile salmon and steelhead were collected in 2004, compared to 4,492,886 collected in 2003. A total of 685 fish were bypassed back to the river in 2004, compared to 28 fish in 2003. A total of 5,061,022 juvenile fish were transported from Little Goose Lock and Dam in 2004. At Lower Monumental Lock and Dam, 1,330,487 juvenile salmon and steelhead were collected, compared to 2,016,757 in 2003. A total of 15,144 fish were bypassed from Lower Monumental Lock and Dam in 2004, compared to 117,625 in 2003. A total of 1,312,085 juvenile fish were transported from Lower Monumental Lock and Dam in 2004. Voluntary spill for juvenile fish passage was restricted at Lower Monumental Lock and Dam during 2004 due to the low flow year, unlike the 2003 season when voluntary spill resumed after repair of erosion areas in the spillway stilling basin.

At McNary Lock and Dam, normal operations are to bypass fish in the spring until approximately mid-June when collection and transport of summer migrants begin. Some marked fish were transported during the spring of 2004 for research purposes. A total of 8,658,400 juvenile salmon and steelhead were collected in 2004, compared to 8,843,494 in 2003. Approximately 1,997,306 of the fish collected were bypassed back to the river to meet fishery agency requirements. A total of 6,587,876 juvenile fish were transported from McNary Lock and Dam in 2004.

A grand total of 26,843,926 juvenile salmon and steelhead were collected at all projects in 2004, compared to 21,537,365 in 2003. A total of 24,214,817 fish were transported in 2004, 80 percent of those collected. Of the fish transported,

24,086,645 were transported by barge (99.5 percent) and 128,172 were trucked (0.5 percent).

## 12. LOWER MONUMENTAL LOCK AND DAM, LAKE HERBERT G. WEST, WA

**Location.** This dam is on the Snake River at the head of Lake Sacajawea (Ice Harbor Reservoir), about 45 miles northeast of Pasco, WA, and 41.6 miles above the river mouth.

**Existing project.** The project includes a dam, powerplant, navigation lock, two fish ladders, and appurtenant facilities. The project provides for navigation, hydroelectric power generation, recreation, and incidental irrigation. The reservoir has a normal operating range between elevations 540 and 537 msl. Lake Herbert G. West extends upstream approximately 28.7 miles and provides slack water to Little Goose Lock and Dam. The dam structure is approximately 3,791 feet long and approximately 135 feet above the streambed. The fish passage facilities include two fish ladders, one at each end of the dam. The powerhouse has six 135,000-kW generating units in operation for a capacity of 810,000 kW. The spillway dam is 572 feet long, and the overflow crest at elevation 483 msl is surmounted by eight tainter gates, 50 feet wide and 60 feet high, that provide capacity to pass a design flood of 850,000 cfs. The deck is at elevation 553 msl and provides a service road and track for a gantry crane. The navigation lock is a single-lift type with clear plan dimensions of 86 by 666 feet and a 15-foot minimum depth of the sills. A navigation channel 250 feet wide, 14 feet deep, and 28.1 miles long is provided from the dam to Little Goose Lock and Dam. Relocations along the lake included railroads and highways. Principal data are set forth in table 30-C.

Construction of the original project started in June 1961. It was placed in operation in 1969 and completed in 1976. Construction of the additional generating units started in 1975 and was completed in 1981. Power generation through September 2004 was 99.20 billion kW hours.

Lake West offers seven day-use areas, five areas offering camping, five boat launch areas, and one designated swimming beach. Total visitation on Lake West for the FY was 109,727.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: During the FY, 2.18 billion kW hours of electrical power were generated by the six generating units. Traffic through the navigation lock consisted of grains, petroleum products, fertilizer, wood products, and miscellaneous cargo and amounted to 3,104,600 tons during calendar year 2004. The FY costs were \$7,402,506. (See table 30-A, Cost and Financial Statement.)

**13. LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN, WA, OR, AND ID**

**Location.** This project is at various locations within the Columbia and Snake River drainages in the states of Idaho, Oregon, and Washington.

**Existing project.** The project consists of a series of fish hatcheries, wildlife development areas, and purchase of off-site project lands for fishing and hunting access. The project will compensate for loss of wildlife habitat and anadromous and resident fishery inundated as a result of construction of four multipurpose dams and reservoirs on the lower Snake River (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Locks and Dams).

The real estate design memorandum and feature design memorandums on all hatcheries and satellites, the off-project wildlife lands, and the site selection report have all been approved. A final Environmental Impact Statement was filed with the Council on Environmental Quality on November 2, 1977. The Dworshak National Fish Hatchery Expansion, Irrigon, Hagerman, Lyons Ferry, Lookingglass, McCall, Sawtooth, Magic Valley, and Clearwater hatcheries (including their respective satellite facilities) are all in operation. Transfer actions were completed in FY 04 for Big Canyon and Pittsburg Landing. Captain John Rapids is scheduled to be completed by the end of FY 05. Fencing is complete at all wildlife development areas. Off-project land acquisition is 100-percent complete. Habitat development continues at many of these sites. A plan for woody riparian habitat development is being initiated to compensate for habitat losses resulting from the inundation of habitat. This will result in the creation of new riparian habitat areas. The compensation project is scheduled for completion in FY 10.

Estimated Federal cost for the project is \$261,000,000.

**Local Cooperation.** None required.

**14. McNARY LOCK AND DAM, LAKE WALLULA, OR AND WA**

**Location.** This dam is on the Columbia River, 292 miles above the mouth, near Umatilla, OR, and 3 miles above the mouth of the Umatilla River.

**Existing project.** The project includes a dam, powerplant, navigation lock, two fish ladders, appurtenant facilities, and a system of levees and pumping plants. The project provides for slack water navigation, hydroelectric power generation, recreation, and incidental irrigation. The reservoir has a normal operating range between elevations 340 and 335 msl. Lake Wallula extends upstream approximately 64 miles and provides slack water to Ice Harbor Lock and Dam. The dam structure is 7,365 feet long and approximately 183 feet above the streambed. Fish passage facilities include two fish ladders. The powerhouse has fourteen 70,000-kW generating units in operation for a capacity of 980,000 kW. The spillway dam is 1,310 feet long, and the overflow crest is at elevation 291 msl and is surmounted by 22 vertical lift gates, 50 feet wide and 51 feet high, which provide the capacity to pass a design flood of 2.2 million cfs. The navigation lock is a single-lift type with clear plan dimensions of 86 by 683 feet and a 15-foot minimum depth over the sills. A navigation channel (250 feet wide, 14 feet deep, and 32 miles long) is provided from the dam to the mouth of the Snake River. Relocations along the lake included railroad bridges over the Columbia and Snake Rivers in order to eliminate hazards to navigation. Principal project data are set forth in table 30-C.

Construction began in May 1947. It was placed in operation in 1953 and was completed in 1982. Power generation through September 2004 was 317.70 billion kW hours.

**Local cooperation.** None required.

**Operations during FY.** Operation and Maintenance: During the FY, 9.8 billion kW hours of electrical power were generated by the 14 generating units. Traffic through the navigation lock consisted of grains, petroleum products, fertilizer, wood products, and miscellaneous cargo and amounted to 7,425,400 tons during calendar year 2004. The FY costs were \$17,342,655. (See table 30-A, Cost and Financial Statement.)

Recreation areas on Lake Wallula include 19 sites offering day use or picnicking, 5 campgrounds, 14 boat launching ramps, and 9 swimming areas. The Pacific Salmon Visitor Information Center at McNary Lock and Dam, staffed by park rangers, provides a regional overview of Corps efforts in salmon recovery issues. Total visitation on Lake Wallula for the FY was 3,863,501.

**15. RURAL IDAHO, ID, ENVIRONMENTAL INFRASTRUCTURE AND RESOURCE PROTECTION AND DEVELOPMENT PROGRAM**

**Location.** Projects are at various locations within the state of Idaho.

**Existing project.** The primary objective of this program is to provide design and construction assistance to non-Federal interests for carrying out water related environmental infrastructure and resource protection and development projects. Projects may include wastewater treatment and related facilities, water supply and related facilities, environmental restoration, and surface water resource protection and development. Projects are authorized under Section 595 of the Water Resources Development Act of 1999, PL 106-53, as amended.

**Local cooperation.** Local sponsors are responsible for 25 percent of costs associated with the projects.

**Operations during FY.** The following improvements were accomplished in FY 04: (1) Completed construction of a wastewater lagoon with the City of Horseshoe Bend; and (2) Designed reimbursement and initial construction of an administration building supporting the wastewater treatment plant with the City of Burley. The FY costs were \$778,201. (See table 30-A, Cost and Financial Statement.)

**16. MISCELLANEOUS WORK UNDER SPECIAL AUTHORIZATION**

**Flood control activities pursuant to Section 205, PL 858, 80th Congress, as amended:**

The FY costs were \$73,434 with three continuing flood control activities: (1) Section 205 coordination (\$15,000); (2) Coppei Creek, WA (\$56,434); and (3) Boise River Eckart Road to Warm Springs, ID (\$2,000). There were no new flood control activities.

**Emergency flood control activities-repair, flood fighting, and rescue work (PL 99, 84th Congress, and antecedent legislation):**

There were no Federal costs this FY.

**Emergency bank protection (Section 14, Flood Control Act of 1946, PL 526, 79th Congress):**

The FY costs were \$10,000 for Section 14 Coordination and \$14,408 for Potlatch River, ID.

**Snagging and clearing of navigable streams and tributaries in interest of flood control (Section 208, Flood Control Act of 1954, PL 780, 83rd Congress):**

The FY costs were \$5,000 for Section 208 Coordination.

**Project modification for the improvement of the environment (Section 1135(b), PL 99-662, as amended):**

The FY costs were \$396,511 for continuation of six environmental restoration projects and coordination funds including: (1) Coordination Account (\$4,078); (2) Walla Walla River, OR (\$38,000); (3) City of Richland Ecosystem Restoration (\$48,400); (4) Boise River at Eagle Island (\$94,109); (5) Bennington Lake Diversion Dam, WA (\$132,000); and (6) Two Rivers, Benton County, WA (\$79,924). There were no new section 1135 projects.

**Project modification for Aquatic Ecosystem Restoration (Section 206, PL 104-303, as amended):**

The FY costs were \$732,543 for continuation of nine aquatic ecosystem restoration projects and coordination account, including: (1) Coordination Account (\$12,000); (2) Ladd Marsh, OR (\$20,004); (3) Salmon River, ID (\$70,000); (4) Paradise Creek, Moscow, ID (\$52,322); (5) Indian Creek Ecosystem Restoration, ID (\$158,038); (6) Twin Falls, ID (\$153,851); (7) Fox Creek, Huntsman Reach, ID (\$100,010); (8) Walla Walla River Ecosystem Restoration (\$25,898); and (9) Camp Creek, OR (\$140,420).

**General Investigations**

**17. COLLECTION AND STUDY OF BASIC DATA**

During the FY, flood hazard data for a number of locations in the District were collected and analyzed. Flood information was provided to several Federal agencies; the states of Idaho, Oregon, and Washington; various cities and counties in those states; and some private organizations.

Total cost of collection and study of basic data during the FY was \$75,001, which included: Flood Plain Management Services (\$25,000); Technical Services (\$29,131); Quick Responses (\$6,000); and Special Studies (\$14,870).

**18. PRECONSTRUCTION, ENGINEERING, AND DESIGN**

None.

**19. SURVEYS**

**Boise River.** Lack of sponsor.

**Little Wood River.** Lack of sponsor.

The total FY 04 costs for surveys were \$838,472, including special studies [Walla Walla River Watershed (\$678,159)]; Miscellaneous Activities [Special Investigations, FERC Licensing Activities, North American Waterfowl Management Plan, and Interagency Water Resource Development (\$82,100)]; Coordination with other Federal Agencies (\$7,000); and Planning Assistance to States (\$71,213).

WALLA WALLA, WA, DISTRICT

**TABLE 30-A COST AND FINANCIAL STATEMENT**

| See<br>Section<br>In Text | Project  | Funding  | FY 01(\$)  | FY 02 (\$) | FY 03 (\$) | FY 04 (\$) | Total Cost to<br>Sep 30, 2004<br>(\$) |
|---------------------------|--|----------|------------|------------|------------|------------|---------------------------------------|
| 3.                        | Jackson Hole, WY   | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | 33,000     | 76,000     | 2,634,070                             |
|                           |  | Cost     | -          | -          | 33,000     | 75,000     | 2,633,070                             |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 1,871,951  | 968,488    | 700,000    | 420,933    | 12,087,060                            |
|                           |  | Cost     | 1,783,387  | 1,064,412  | 655,267    | 335,979    | 11,957,356                            |
|                           | (Contributed funds)  | Maint.   |            |            |            |            |                                       |
|                           |  | Contrib. | -          | -          | -          | -          | 378,798                               |
|                           |  | Cost     | -          | -          | -          | -          | 378,798                               |
| 4.                        | Lucky Peak Lake, ID  | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 19,652,081                            |
|                           |  | Cost     | -          | -          | -          | -          | 19,652,081                            |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 1,451,180  | 1,619,997  | 1,540,826  | 1,596,328  | 31,099,680                            |
|                           |  | Cost     | 1,768,708  | 1,592,648  | 1,571,213  | 1,572,487  | 30,975,894                            |
| 5.                        | Mill Creek, WA   | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 2,258,495                             |
|                           |  | Cost     | -          | -          | -          | -          | 2,258,495                             |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 1,377,275  | 2,036,402  | 1,093,000  | 798,352    | 23,267,810                            |
|                           |  | Cost     | 1,435,619  | 2,041,853  | 1,078,734  | 794,416    | 23,249,571                            |
|                           |  | Rehab    |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 17,714,102                            |
|                           |  | Cost     | -          | -          | -          | -          | 17,714,102                            |
| 7.                        | Columbia River Fish<br>Mitigation Program,<br>OR, WA, and ID | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | 41,040,000 | 29,210,362 | 21,094,457 | 25,490,000 | 484,904,000                           |
|                           |  | Cost     | 41,882,547 | 30,947,014 | 21,339,347 | 25,488,956 | 484,889,000                           |
| 8.                        | Dworshak Dam and<br>Reservoir, ID                            | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 327,482,196                           |
|                           |  | Cost     | -          | -          | -          | -          | 327,482,196                           |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 9,769,017  | 11,122,654 | 10,553,006 | 8,225,299  | 199,824,658                           |
|                           |  | Cost     | 9,781,613  | 11,080,909 | 10,239,516 | 8,421,941  | 199,557,703                           |
| 9.                        | Ice Harbor Lock and<br>Dam, WA                               | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 210,249,757                           |
|                           |  | Cost     | -          | -          | -          | -          | 210,249,757                           |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 10,201,830 | 10,515,723 | 11,808,101 | 8,200,227  | 202,213,078                           |
|                           |  | Cost     | 10,017,804 | 10,585,642 | 11,268,235 | 8,726,044  | 202,029,615                           |
| 10.                       | Little Goose Lock and<br>Dam, WA                             | New Work |            |            |            |            |                                       |
|                           |  | Approp.  | -          | -          | -          | -          | 262,632,022                           |
|                           |  | Cost     | -          | -          | -          | -          | 262,632,022                           |
|                           |  | Maint.   |            |            |            |            |                                       |
|                           |  | Approp.  | 6,737,274  | 8,425,824  | 8,450,437  | 5,738,585  | 140,976,684                           |
|                           |  | Cost     | 6,724,597  | 8,254,150  | 8,260,804  | 5,978,700  | 140,790,261                           |

**REPORT OF THE SECRETARY OF THE ARMY ON CIVIL WORKS ACTIVITIES FOR FY 04**

**TABLE 30-A (Continued)**

**COST AND FINANCIAL STATEMENT**

| <b>See Section In Text</b> | <b>Project</b>  | <b>Funding</b> | <b>FY 01 (\$)</b> | <b>FY 02 (\$)</b> | <b>FY 03 (\$)</b> | <b>FY 04 (\$)</b> | <b>Total Cost to Sep 30, 2004 (\$)</b> |
|----------------------------|---|----------------|-------------------|-------------------|-------------------|-------------------|--|
| 11.                        | Lower Granite Lock and Dam, WA  | New Work       |                   |                   |                   |                   |  |
|                            |   | Approp.        | -                 | -                 | -                 | -                 | 400,080,315                            |
|                            |   | Cost           | -                 | -                 | -                 | -                 | 400,080,315                            |
|                            |   | Maint.         |                   |                   |                   |                   |  |
|                            |   | Approp.        | 9,740,100         | 14,099,858        | 12,888,666        | 8,396,622         | 202,112,549                            |
|                            |   | Cost           | 9,993,910         | 14,108,361        | 12,148,272        | 8,554,949         | 201,382,612                            |
| 12.                        | Lower Monumental Lock and Dam, WA   | New Work       |                   |                   |                   |                   |  |
|                            |   | Approp.        | -                 | -                 | -                 | -                 | 238,612,732                            |
|                            |   | Cost           | -                 | -                 | -                 | -                 | 238,612,732                            |
|                            |   | Maint.         |                   |                   |                   |                   |  |
|                            |   | Approp.        | 15,627,677        | 4,162,583         | 11,432,459        | 7,034,642         | 153,375,265                            |
|                            |   | Cost           | 8,470,468         | 10,722,283        | 11,557,794        | 7,402,506         | 153,043,412                            |
| 13.                        | Lower Snake River Fish and Wildlife Compensation Plan WA, OR, and ID (Contributed funds)      | New Work       |                   |                   |                   |                   |  |
|                            |   | Approp.        | 888,000           | 1,570,638         | 1,250,543         | 1,539,000         | 235,021,000                            |
|                            |   | Cost           | 1,054,271         | 1,572,257         | 1,267,395         | 1,511,000         | 234,993,000                            |
|                            |   | New Work       |                   |                   |                   |                   |  |
|                            |   | Contrib.       | -                 | -                 | -                 | -                 | 223,965                                |
|                            |   | Cost           | -                 | -                 | -                 | -                 | 223,965                                |
| 14.                        | McNary Lock and Dam, Lake Wallula, OR and WA (Contributed funds)                              | New Work       |                   |                   |                   |                   |  |
|                            |   | Approp.        | -                 | -                 | -                 | -                 | 375,214,469                            |
|                            |   | Cost           | -                 | -                 | -                 | -                 | 375,214,469                            |
|                            |   | Maint.         |                   |                   |                   |                   |  |
|                            |   | Approp.        | 15,111,061        | 17,805,600        | 22,344,583        | 14,446,807        | 355,833,560                            |
|                            |   | Cost           | 14,980,047        | 17,668,731        | 19,748,971        | 17,342,655        | 355,429,019                            |
|                            |   | Maint.         |                   |                   |                   |                   |  |
|                            |   | Contrib.       | -                 | -                 | -                 | -                 | 43,707                                 |
|                            |   | Cost           | -                 | -                 | -                 | -                 | 43,707                                 |
| 15.                        | Rural Idaho, ID, Environmental Infrastructure and Resource Protection and Development Program | New Work       |                   |                   |                   |                   |  |
|                            |   | Approp.        | -                 | -                 | -                 | 809,900           | 809,900                                |
|                            |   | Cost           | -                 | -                 | -                 | 778,201           | 778,201                                |
|                            |   | Maint.         |                   |                   |                   |                   |  |
|                            |   | Approp.        | -                 | -                 | -                 | -                 | -                                      |
|                            |   | Cost           | -                 | -                 | -                 | -                 | -                                      |

**WALLA WALLA, WA, DISTRICT**

**TABLE 30-B**

**AUTHORIZING LEGISLATION**

| See<br>Section<br>In Text | Date<br>Authorizing<br>Act                 | Project and Work Authorized  | Documents  |
|---------------------------|--|--|--|
| 4.                        | Jul 24, 1946                               | <b>LUCKY PEAK LAKE, ID</b><br>Dam for flood control, irrigation, and recreation.   | PL 79-526, Chief of Engineers Report, dated May 13, 1946.  |
|                           | Oct 22, 1976<br>Dec 22, 1944<br>as amended | Second outlet for streamflow maintenance. Deauthorized in 1990.<br>Construction, operation, and maintenance of recreation facilities.  | PL 94-587<br>Sec. 4, Flood Control Act of 1944   |
| 5.                        | Jul 28, 1938<br>as amended<br>Aug 18, 1941 | <b>MILL CREEK, WALLA WALLA, WA</b><br>Off-stream storage project upstream from Walla Walla.<br><br>Channel improvement through Walla Walla; concrete-lined channel.                          | H. Doc. 578, 75th Cong., 3rd Session<br>H. Doc. 719, 76th Cong.<br>Sec 377, PL 77-228, Cong. 3rd Session |
|                           | Oct 31, 1992                               | Redesignation of reservoir to the Virgil B. Bennington Lake.   | Sec. 118 PL 102-580<br>102nd Cong.   |
| 7.                        | Jul 19, 1988                               | <b>COLUMBIA RIVER FISH MITIGATION PROGRAM</b><br>Design, test, and construct fish bypass facilities at Lower Monumental, Ice Harbor, Little Goose, Lower Granite, and McNary Locks and Dams. | PL 100-371   |
| 8.                        | Jul 3, 1958                                | <b>DWORSHAK DAM AND RESERVOIR, ID</b><br>Preparation of detailed plans.  | S. Doc. 51, 84th Cong., 1st Session  |
|                           | Aug 15, 1963<br>Oct 23, 1962               | Redesignation of project as Dworshak Dam and Reservoir.<br>Dworshak Dam added Units 4, 5, and 6, Idaho. Units 5 and 6 were deauthorized in FY 1990. Unit 4 was deauthorized in FY 95.        | PL 88-96<br>PL 87-874  |
| 9.                        | Mar 2, 1945                                | <b>ICE HARBOR LOCK AND DAM, LAKE SACAJAWEA, WA</b><br>Unit 1 of 4, Lower Snake River Project. Lock and dam for navigation, power, recreation, and incidental irrigation.                     | H. Doc. 704, 75th Cong., 3rd Session   |
|                           | Dec 22, 1944<br>as amended                 | Construction, operation, and maintenance of recreation facilities.   | Sec. 4, Flood Control Act of 1944  |
| 10.                       | Mar 2, 1945                                | <b>LITTLE GOOSE LOCK AND DAM, LAKE BRYAN, WA</b><br>Unit 3 of 4, Lower Snake River Project. Lock and dam for navigation, power, recreation, and incidental irrigation.                       | H. Doc. 704, 75th Cong., 3rd Session   |
|                           | Dec 31, 1970                               | Designation of reservoir as Lake Bryan.  | PL 91-638  |
| 11.                       | Mar 2, 1945                                | <b>LOWER GRANITE LOCK AND DAM, LOWER GRANITE LAKE, WA</b><br>Unit 4 of 4, Lower Snake River Project. Lock and dam for navigation, power, recreation, and incidental irrigation.              | H. Doc. 704, 75th Cong., 3rd Session   |
| 12.                       | Mar 2, 1945                                | <b>LOWER MONUMENTAL LOCK AND DAM, LAKE HERBERT G. WEST, WA</b><br>Unit 2 of 4, Lower Snake River Project. Lock and dam for navigation, power, recreation, and incidental irrigation.         | H. Doc. 704, 75th Cong., 3rd Session   |
|                           | May 25, 1978                               | Designation of reservoir as Lake Herbert G. West.  | PL 95-285  |



**REPORT OF THE SECRETARY OF THE ARMY ON CIVIL WORKS ACTIVITIES FOR FY 04**

**TABLE 30-B (Continued)**

**AUTHORIZING LEGISLATION**

| See<br>Section<br>In Text | Date<br>Authorizing<br>Act | Project and Work Authorized  | Documents   |
|---------------------------|----------------------------|--|---|
| 13.                       |                            | <b>LOWER SNAKE RIVER FISH AND WILDLIFE<br/>COMPENSATION PLAN, WA, OR, AND ID</b>   |   |
|                           | Oct 22, 1976<br>as amended | Fish hatcheries and replacement of wildlife habitat.   | PL 94-587   |
|                           | Nov 17, 1986               | Changes to land acquisition authority.   | H.R. 6 PL 99-662  |
| 14.                       |                            | <b>McNARY LOCK AND DAM, LAKE WALLULA, OR<br/>AND WA</b>  |   |
|                           | Mar 2, 1945                | Lock and dam for navigation, power, recreation, and irrigation.  | H. Doc. 704, 75th<br>Cong., 3rd Session                             |
|                           | Dec 22, 1944<br>as amended | Construction, operation, and maintenance of recreation facilities.   | Sec. 4, Flood Control<br>Act of 1944                                |
|                           | Nov 17, 1986               | Construction, operation, and maintenance of a second powerhouse.<br>McNary Lock and Dam Second Powerhouse automatically<br>deauthorized on Nov 16, 1991. | H.R. 6, PL 99-662<br>Sec. 1001, PL 99-362                           |
| 15.                       |                            | <b>SNAKE RIVER TO JOHNSON BAR, OR, WA, AND ID</b>  |   |
|                           | Jun 13, 1902               | Open-river navigation Riparia to Pittsburg Landing.  | H. Doc. 127, 56th Cong,<br>2nd Session                              |
|                           | Jun 25, 1910               | Mouth to Riparia.  | H. Doc. 411, 55th Cong,<br>2nd Session                              |
|                           | Aug 30, 1935               | Pittsburg Landing to Johnson Bar.  | Rivers and Harbors<br>Committee, Doc. 25,<br>72nd Cong, 1st Session |
|                           | Mar 2, 1945                | Supersedes previous legislation, mouth to Lewiston, ID, only.<br>See Ice Harbor, Lower Monumental, Little Goose, and Lower<br>Granite Locks and Dams.    | H. Doc. 704, 75th Cong.,<br>2nd Session                             |

WALLA WALLA, WA, DISTRICT

**TABLE 30-C PRINCIPAL DATA CONCERNING NAVIGATION LOCK,  
SPILLWAY DAM, POWERPLANT, AND IMPOUNDMENT**

| Project   |                                |  |
|---|--------------------------------|--|
| Dworshak Dam and Reservoir, ID<br>(see Section 8 of text) | <b>SPILLWAY DAM</b>            |  |
|   | Type of Construction           | Concrete Gravity                             |
|   | Completed                      | September 1974                               |
|   | Maximum Capacity               | 150,500 cfs <sup>1</sup>                     |
|   | Crest Elevation                | 1,545 ft <sup>2</sup>                        |
|   | Control Gates:                 |  |
|   | Type                           | Tainter                                      |
|   | Size, Width by Height          | 50 by 56.4 ft                                |
|   | Number                         | 2  |
|   | <b>POWERPLANT</b>              |  |
|   | Length                         | 428 ft                                       |
|   | Generating Units:              |  |
|   | Number Installed               | 3  |
|   | Rating, Each                   | 2 @ 90,000 kW <sup>3</sup><br>1 @ 220,000 kW |
|   | Total Capacity Installed       | 400,000 kW                                   |
|   | Space for Additional           | 3  |
|   | Rating, Each                   | 3 @ 220,000 kW                               |
|   | Total Potential Capacity       | 1,060,000 kW                                 |
|   | Maximum Structural Height      | 717 ft                                       |
|   | First Power-On-Line            | March 1973                                   |
|   | <b>IMPOUNDMENT</b>             |  |
|   | Elevations:                    |  |
|   | Normal Operating Range         | 1,600 to 1,445 ft                            |
|   | Maximum                        | 1,605 ft                                     |
|   | Flood Control Storage          | 2,000,000 ac-ft <sup>4</sup>                 |
|   | Lake Length                    | 53.6 mi <sup>5</sup>                         |
| Lake Water Surface Area at Elevation 1,600                | 17,090 ac <sup>6</sup>         |  |
| Length of Shoreline                                       | 175 mi                         |  |
| Ice Harbor Lock and Dam, WA<br>(see Section 9 of Text)    | <b>NAVIGATION LOCK</b>         |  |
|   | Clear Width                    | 86 ft  |
|   | Clear Length                   | 675 ft                                       |
|   | Lift:                          |  |
|   | Minimum                        | 97 ft  |
|   | Average                        | 100 ft                                       |
|   | Maximum                        | 105 ft                                       |
|   | Minimum Water Depth Over Sills | 16 ft  |
|   | Open to Navigation             | May 1962                                     |
|   | <b>SPILLWAY DAM</b>            |  |
|   | Type of Construction           | Concrete Gravity                             |
|   | Completed                      | January 1962                                 |
|   | Maximum Capacity               | 850,000 cfs                                  |
|   | Crest Elevation                | 391 ft                                       |
| Control Gates:  |                                |  |
| Type  | Tainter                        |  |
| Size, Width by Height                                     | 50 by 52.9 ft                  |  |
| Number  | 10                             |  |

**PRINCIPAL DATA CONCERNING NAVIGATION LOCK,  
TABLE 30-C (Continued) SPILLWAY DAM, POWERPLANT, AND IMPOUNDMENT**

| Project   |  |                                 |
|---|--|---------------------------------|
|   | <b>POWERPLANT</b>                        |                                 |
|   | Length                                   | 671 ft                          |
|   | Generating Units:                        |                                 |
|   | Number Installed                         | 6                               |
|   | Rating, Each                             | 3 @ 90,000 kW<br>3 @ 111,000 kW |
|   | Total Capacity Installed                 | 603,000 kW                      |
|   | Maximum Structural Height                | 226 ft                          |
|   | First Power-On-Line                      | December 1961                   |
|   | <b>IMPOUNDMENT</b>                       |                                 |
|   | Elevations:                              |                                 |
|   | Normal Operating Range                   | 440 to 437 ft                   |
|   | Maximum                                  | 446 ft                          |
|   | Lake Length                              | 31.9 mi                         |
|   | Lake Water Surface Area at Elevation 440 | 8,375 ac                        |
|   | Navigation Channel, Depth by Width       | 14 by 250 ft                    |
|   | Length of Shoreline                      | 80 mi                           |
| Little Goose Lock and Dam, WA<br>(see Section 10 of text) | <b>NAVIGATION LOCK</b>                   |                                 |
|   | Clear Width                              | 86 ft                           |
|   | Clear Length                             | 668 ft                          |
|   | Lift:                                    |                                 |
|   | Minimum                                  | 93 ft                           |
|   | Average                                  | 98 ft                           |
|   | Maximum                                  | 101 ft                          |
|   | Minimum Water Depth Over Sills           | 15 ft                           |
|   | Opened to Navigation                     | May 1970                        |
|   | <b>SPILLWAY DAM</b>                      |                                 |
|   | Type of Construction                     | Concrete Gravity                |
|   | Completed                                | January 1970                    |
|   | Maximum Capacity                         | 850,000 cfs                     |
|   | Crest Elevation                          | 581 ft                          |
|   | Control Gates:                           |                                 |
|   | Type                                     | Tainter                         |
|   | Size, Width by Height                    | 50 by 60 ft                     |
|   | Number                                   | 8                               |
|   | <b>POWERPLANT</b>                        |                                 |
|   | Length                                   | 656 ft                          |
|   | Width                                    | 243 ft                          |
|   | Generating Units:                        |                                 |
|   | Number Installed                         | 6                               |
|   | Rating, Each                             | 135,000 kW                      |
|   | Total Capacity Installed                 | 810,000 kW                      |
|   | Maximum Structural Height                | 226 ft                          |
|   | First Power-On-Line                      | March 1970                      |

WALLA WALLA, WA, DISTRICT

**PRINCIPAL DATA CONCERNING NAVIGATION LOCK,  
TABLE 30-C (Continued) SPILLWAY DAM, POWERPLANT, AND IMPOUNDMENT**

| Project  |  |                  |
|--|--|------------------|
|  | <b>IMPOUNDMENT</b>                       |                  |
|  | Elevations:                              |                  |
|  | Normal Operating Range                   | 638 to 633 ft    |
|  | Maximum                                  | 646.5 ft         |
|  | Lake Length                              | 37.2 mi          |
|  | Lake Water Surface Area at Elevation 738 | 10,025 ac        |
|  | Navigation Channel, Depth by Width       | 14 by 250 ft     |
|  | Length of Shoreline                      | 92 mi            |
| Lower Granite Lock and Dam, WA<br>(see Section 11 of text) | <b>NAVIGATION LOCK</b>                   |                  |
|  | Clear Width                              | 86 ft            |
|  | Clear Length                             | 674 ft           |
|  | Lift:                                    |                  |
|  | Minimum                                  | 95 ft            |
|  | Average                                  | 100 ft           |
|  | Maximum                                  | 105 ft           |
|  | Minimum Water Depth Over Sills           | 15 ft            |
|  | Opened to Navigation                     | May 1975         |
|  | <b>SPILLWAY DAM</b>                      |                  |
|  | Type of Construction                     | Concrete Gravity |
|  | Completed                                | February 1975    |
|  | Maximum Capacity                         | 850,000 cfs      |
|  | Crest Elevation                          | 681 ft           |
|  | Control Gates:                           |                  |
|  | Type                                     | Tainter          |
|  | Size, Width by Height                    | 50 by 60 ft      |
|  | Number                                   | 8                |
|  | <b>POWERPLANT</b>                        |                  |
|  | Length                                   | 656 ft           |
|  | Width                                    | 243 ft           |
|  | Generating Units:                        |                  |
|  | Number Installed                         | 6                |
|  | Rating, Each                             | 135,000 kW       |
|  | Total Capacity Installed                 | 810,000 kW       |
|  | Maximum Structural Height                | 228 ft           |
|  | First Power-On-Line                      | April 1975       |
|  | <b>IMPOUNDMENT</b>                       |                  |
|  | Elevations:                              |                  |
|  | Normal Operation Range                   | 738 to 733 ft    |
|  | Maximum                                  | 746.5 ft         |
|  | Lake Length                              | 39.3 mi          |
|  | Lake Water Surface Area at Elevation 738 | 8,900 ac         |
|  | Navigation Channel, Depth by Width       | 14 by 250 ft     |
|  | Length of Shoreline                      | 91 mi            |

**PRINCIPAL DATA CONCERNING NAVIGATION LOCK,  
TABLE 30-C (Continued) SPILLWAY DAM, POWERPLANT, AND IMPOUNDMENT**

| <b>Project</b>  |                                       |
|---|---------------------------------------|
| Lower Monumental Lock and Dam,<br>WA (see Section 12 of text) | <b>NAVIGATION LOCK</b>                |
|   | Clear Width 86 ft                     |
|   | Clear Length 666 ft                   |
|   | Lift:                                 |
|   | Minimum 97 ft                         |
|   | Average 98 ft                         |
|   | Maximum 103 ft                        |
|   | Minimum Water Depth Over Sills 15 ft  |
|   | Opened to Navigation April 1969       |
|   | <b>SPILLWAY DAM</b>                   |
|   | Type of Construction Concrete Gravity |
|   | Completed March 1969                  |
|   | Maximum Capacity 850,000 cfs          |
|   | Crest Elevation 483 ft                |
|   | Control Gates:                        |
|   | Type Tainter                          |
|   | Size, Width by Height 50 by 60 ft     |
|   | Number 8                              |
|   | <b>POWERPLANT</b>                     |
|   | Length 656 ft                         |
|   | Width 243 ft                          |
|   | Generating Units:                     |
|   | Number Installed 6                    |
|   | Rating, Each 135,000 kW               |
|   | Total Capacity Installed 810,000 kW   |
|   | Maximum Structural Height 242 ft      |
|   | First Power-On-Line May 1969          |
| <b>IMPOUNDMENT</b>  |                                       |
| Elevations:   |                                       |
| Normal Operating Range 540 to 537 ft                          |                                       |
| Maximum 548 ft  |                                       |
| Lake Length 28.7 mi   |                                       |
| Lake Water Surface Area at Elevation 540 6,590 ac             |                                       |
| Navigation Channel, Depth by Width 14 by 250 ft               |                                       |
| Length of Shoreline 78 mi                                     |                                       |
| McNary Lock and Dam, OR<br>and WA (see Section 14 of text)    | <b>NAVIGATION LOCK</b>                |
|   | Clear Width 86 ft                     |
|   | Clear Length 683 ft                   |
|   | Lift:                                 |
|   | Minimum 67 ft                         |
|   | Average 75 ft                         |
|   | Maximum 83 ft                         |
|   | Minimum Water Depth Over Sills 15 ft  |
|   | Open to Navigation November 1953      |

WALLA WALLA, WA, DISTRICT

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**PRINCIPAL DATA CONCERNING NAVIGATION LOCK,  
TABLE 30-C (Continued) SPILLWAY DAM, POWERPLANT, AND IMPOUNDMENT**

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| Project |  |                  |
|---------|--|------------------|
|         | <b>SPILLWAY DAM</b>                      |                  |
|         | Type of Construction                     | Concrete Gravity |
|         | Completed                                | October 1953     |
|         | Maximum Capacity                         | 2,200,000 cfs    |
|         | Crest Elevation                          | 291 ft           |
|         | Control Gates:                           |                  |
|         | Type                                     | Vertical Lift    |
|         | Size, Width by Height                    | 50 by 51 ft      |
|         | Number                                   | 22               |
|         | <b>POWERPLANT</b>                        |                  |
|         | Length                                   | 1,348 ft         |
|         | Generating Units:                        |                  |
|         | Number Installed                         | 14               |
|         | Rating, Each                             | 70,000 kW        |
|         | Total Capacity Installed                 | 980,000 kW       |
|         | Maximum Structural Height                | 220 ft           |
|         | First Power-On-Line                      | November 1953    |
|         | <b>IMPOUNDMENT</b>                       |                  |
|         | Elevations:                              |                  |
|         | Normal Operating Range                   | 340 to 335 ft    |
|         | Maximum                                  | 356.5 ft         |
|         | Lake Length                              | 64 mi            |
|         | Lake Water Surface Area at Elevation 340 | 38,800 ac        |
|         | Navigation Channel, Depth by Width       | 14 by 250 ft     |
|         | Length of Shoreline                      | 242 mi           |

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<sup>1</sup> cubic feet per second

<sup>2</sup> feet

<sup>3</sup> kilowatt

<sup>4</sup> acre-feet

<sup>5</sup> miles

<sup>6</sup> acres

**REPORT OF THE SECRETARY OF THE ARMY ON CIVIL WORKS ACTIVITIES FOR FY 04**

**SNAKE RIVER DOWNSTREAM FROM  
JOHNSON BAR LANDING, OR, WA, AND ID  
(SEE SECTION 15 OF TEXT)**

**TABLE 30-D**

| <b>Project</b>                                    | <b>Estimated Cost<br/>(Corps of<br/>Engineers<br/>Funds Only)</b> | <b>New Work<br/>to September 30, 2004</b> |                        | <b>Maintenance<br/>to September 30, 2004</b> |                      | <b>Percent<br/>Completed</b> | <b>Constr.<br/>Started</b> |
|---|---|---|------------------------|--|----------------------|------------------------------|----------------------------|
|   |   | <b>Approp.</b>                            | <b>Cost</b>            | <b>Approp.</b>                               | <b>Cost</b>          |                              |                            |
| <b>Ice Harbor Lock and Dam</b>                    |   |   |                        |  |                      |                              |                            |
| Initial Project                                   | \$374,617,095   | \$172,587,480                             | \$172,587,480          | \$202,213,078                                | \$202,029,615        | 100                          | FY 56                      |
| Code 710 Rec Facilities                           | 914,256   | 914,256                                   | 914,256                | 0  | 0                    | 100                          | FY 57                      |
| Power Units 4-6                                   | 36,748,021  | 36,748,021                                | 36,748,021             | 0  | 0                    | 100                          | FY 71                      |
| Fish Bypass Program                               | 88,085,000  | 65,343,000                                | 65,335,000             | 0  | 0                    | 74                           | FY 91                      |
| <b>Totals</b>                                     | <b>500,364,372</b>  | <b>275,592,757</b>                        | <b>275,584,757</b>     | <b>202,213,078</b>                           | <b>202,029,615</b>   | <b>93</b>                    |                            |
| <b>Little Goose Lock and Dam</b>                  |   |   |                        |  |                      |                              |                            |
| Initial Project                                   | 342,480,476   | 201,690,215                               | 201,690,215            | 140,976,684                                  | 140,790,261          | 100                          | FY 63                      |
| Power Units 4-6                                   | 60,941,807  | 60,941,807                                | 60,941,807             | 0  | 0                    | 100                          | FY 74                      |
| Fish Bypass Program                               | 85,508,000  | 43,607,000                                | 43,607,000             | 0  | 0                    | 51                           | FY 89                      |
| <b>Totals</b>                                     | <b>488,930,283</b>  | <b>306,239,022</b>                        | <b>306,239,022</b>     | <b>140,976,684</b>                           | <b>140,790,261</b>   | <b>91</b>                    |                            |
| <b>Lower Granite Lock and Dam</b>                 |   |   |                        |  |                      |                              |                            |
| Initial Project                                   | 555,186,593   | 353,803,981                               | 353,803,981            | 202,112,549                                  | 201,382,612          | 100                          | FY 65                      |
| Code 710 Rec Facilities                           | 63,800  | 63,800                                    | 63,800                 | 0  | 0                    | 100                          | FY 84                      |
| Power Units 4-6                                   | 46,212,534  | 46,212,534                                | 46,212,534             | 0  | 0                    | 100                          | FY 74                      |
| Fish Bypass Program                               | 58,620,000  | 35,997,000                                | 35,997,000             | 0  | 0                    | 61                           | FY 88                      |
| <b>Totals</b>                                     | <b>660,082,927</b>  | <b>436,077,315</b>                        | <b>436,077,315</b>     | <b>202,112,549</b>                           | <b>201,382,612</b>   | <b>96</b>                    |                            |
| <b>Lower Monumental Lock and Dam</b>              |   |   |                        |  |                      |                              |                            |
| Initial Project                                   | 339,994,773   | 186,951,361                               | 186,951,361            | 153,375,265                                  | 153,043,412          | 100                          | FY 61                      |
| Power Units 4-6                                   | 51,661,371  | 51,661,371                                | 51,661,371             | 0  | 0                    | 100                          | FY 75                      |
| Fish Bypass Program                               | 90,134,000  | 39,636,000                                | 39,636,000             | 0  | 0                    | 44                           | FY 90                      |
| <b>Totals</b>                                     | <b>481,790,144</b>  | <b>278,248,732</b>                        | <b>278,248,732</b>     | <b>153,375,265</b>                           | <b>153,043,412</b>   | <b>89</b>                    |                            |
| <b>Open River Lewiston to Johnson Bar Landing</b> |   |   |                        |  |                      |                              |                            |
|   | 34,613  | 34,613                                    | 34,613                 | 401,583                                      | 401,583              |                              |                            |
| <b>Open River Pasco to Lewiston</b>               |   |   |                        |  |                      |                              |                            |
|   | 0   | 0   | 0                      | 4,350  | 4,350                |                              |                            |
| <b>Totals Existing Project</b>                    | <b>2,131,202,339</b>  | <b>1,296,192,439</b>                      | <b>1,296,184,439</b>   | <b>699,083,509</b>                           | <b>697,651,833</b>   | <b>93</b>                    |                            |
| <b>Previous Projects Pasco to Lewiston</b>        |   |   |                        |  |                      |                              |                            |
|   | 400,150   | 400,150                                   | 400,150                | 186,570                                      | 186,570              |                              |                            |
| <b>Totals Authorized Project</b>                  | <b>\$2,131,602,489</b>  | <b>\$1,296,592,589</b>                    | <b>\$1,296,584,589</b> | <b>\$699,270,079</b>                         | <b>\$697,838,403</b> |                              |                            |