FINDING OF NO SIGNIFICANT IMPACT

COUGAR LAKE
INTAKE STRUCTURE MODIFICATIONS
WILLAMETTE TEMPERATURE CONTROL
MCKENZIE SUBBASIN, OREGON

The proposed action is to modify the intake structure at Cougar Dam and Lake Project as part of the Willamette Temperature Control Project. The purpose of the action is to modify temperatures below Cougar project with the objective of replicating pre-reservoir water temperatures on the South Fork and mainstem of the McKenzie River. This action is expected to improve habitat conditions for salmonids. The Proposed Action was fully described in the 1995 Feasibility Report/Environmental Impact Statement. Briefly, that action is to draw down Cougar Reservoir to near stream level for the four construction seasons, during which time a new, ported, multi-level intake tower will be constructed. Several changes are proposed, as a result of further design study. Some of these changes will alter the impacts previously described in the EIS. Only those changes that alter impacts are discussed in this Environmental Assessment. Construction is now scheduled to begin in the year 2000.

I have reviewed the Environmental Assessment and determined that the proposed action would not significantly affect the quality of the human environment and that an Environmental Impact Statement is not required.

Date: 30 Nov 99

Randall J. Butler

RANDALL J. BUTLER
Colonel, EN
Commanding

COUGAR LAKE
INTAKE STRUCTURE MODIFICATIONS
WILLAMETTE TEMPERATURE CONTROL
MCKENZIE SUBBASIN, OREGON

ENVIRONMENTAL ASSESSMENT

INTRODUCTION

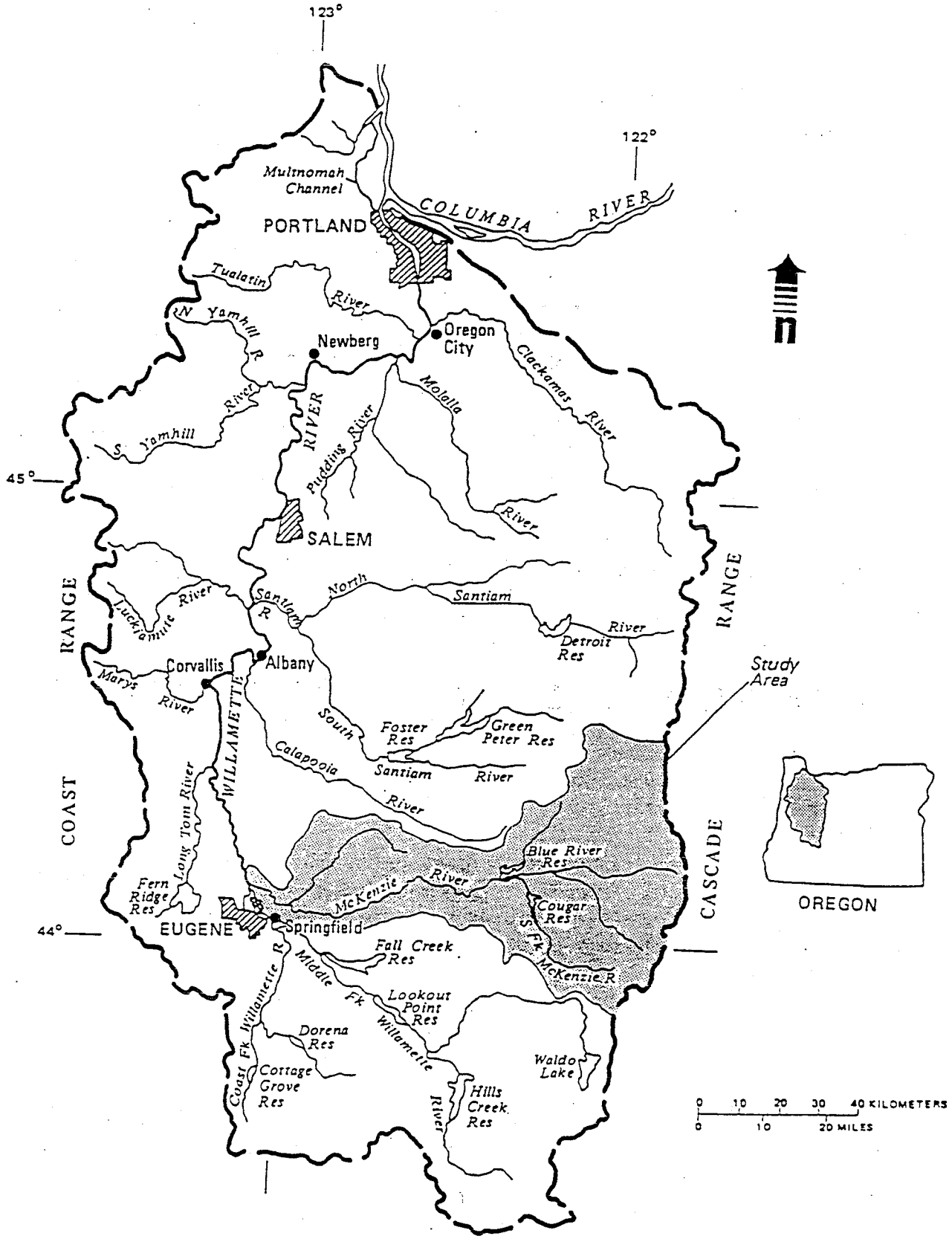
A final Feasibility Report and Environmental Impact Statement (EIS) for Willamette Temperature Control was filed with the Environmental Protection Agency (EPA) in April 1995. The preferred alternative as described in the Record of Decision (ROD) signed January 9, 1997, was to construct intake structure modifications at both Blue River Lake and Cougar Lake. Construction at Cougar Lake was to begin in 1998, followed by Blue River Lake in 2002.

Following the ROD, construction elements at Cougar Lake were further refined in Design Memorandum No. 21, published in July 1998. Construction refinement resulted in changes from the project description in the Feasibility Report. This environmental assessment (EA) addresses changes in the proposed action at Cougar Lake since preparation of the final Feasibility Report/EIS.

Cougar Project is an existing Federal reservoir project located in the watershed of the McKenzie River of western Oregon. (Figure 1) The McKenzie River originates in the upper elevations of the Cascade Mountains, flowing in a generally westerly direction to enter the Willamette River at River Mile (RM) 170.8 near Eugene. The Cougar Project provides flood control and supplemental downstream flows for irrigation, navigation, fisheries, pollution abatement, recreation and power generation.

Project Authorization. The Design Memorandum is part of a response to two Congressional resolutions which provide authority for the U.S. Army Corps of Engineers to conduct temperature control studies at the Blue River and Cougar Lake projects, located in the McKenzie sub-basin of the Willamette River Basin. These resolutions are the Senate Committee on Public Works Resolution adopted November 15, 1961, for the Willamette River Basin Comprehensive Study, and the House Committee on Public Works and Transportation Resolution adopted September 8, 1988, for the Willamette River Basin Review study.

Figure 1 -- *Willamette Basin Location Map*



Construction Authorization. Congressional approval of the construction of the temperature control modifications to the intake structure is included in the "Conference Report on S. 640, Water Resources Development Act of 1996." The report states in Title I - Water Resources Project, Section 101, "Project Authorizations: (a) Projects with Chief's Reports. Except as provided in this subsection, the following projects for water resources development and conservation and other purposes are authorized to be carried out by the Secretary substantially in accordance with the plans and subject to the conditions, described in the respective reports designated in this subsection as follows:

> "....(25) Willamette River Temperature Control, McKenzie Subbasin, Oregon.—The project for environmental restoration, Willamette River Temperature Control, McKenzie Subbasin, Oregon: Report of the Chief of Engineers, dated February 01, 1996, at a total Federal cost of $38,000,000."

NEED FOR ACTION

Although hatchery mitigation was provided for the loss of anadromous fish habitat upstream from the project, downstream impacts to temperatures were not anticipated at the time of construction of Cougar Dam. Compared to conditions prior to construction of the dam, downstream temperatures in the McKenzie River in the late spring and summer are cooler while temperatures in the fall and early winter are warmer. The cooler temperatures impact upstream migration of adult fish and warmer temperatures reduce survival of juveniles by impacting emergence timing. Modification of the intake structure will allow selection of water temperature for release from the project. This is expected to restore pre-project stream temperatures in the South Fork McKenzie River and partially restore pre-project temperatures in the mainstem McKenzie River.

PROPOSED ACTION AND ALTERNATIVES

The Proposed Action was fully described in the 1995 Feasibility Report/EIS. Briefly, that action is to draw down Cougar Reservoir to near stream level for four construction seasons, during which time a new, ported, multi-level intake tower will be constructed. Several changes are proposed, as a result of further design study. Some of these changes will alter the impacts previously described in the EIS. Only those changes that alter impacts are discussed in this EA. Other design changes may be reviewed in the FDM. Construction is now scheduled to begin in the year 2000.

(1) Residual Pool Elevation

The feasibility report called for a minimum residual pool of about 80 surface acres and 3,000 acre-feet of volume. It was expected this residual pool would have an elevation of 1,350 NGVD. Recent data (May 1995 hydrosurveys) developed during preparation of the FDM (1999) indicate a significant decrease in the capacity curve of Cougar Lake. These data place the 1,350-foot elevation residual pool with about 48 acres and a volume of 900 acre-feet. Such a residual pool may not provide adequate refuge habitat for resident fish or allow sediments to settle. A new minimum residual pool is proposed at an elevation of 1,375, providing 2,845 acre-feet of volume with a surface area of 106 acres, a width of about 650 feet and a length of 7,700 feet.(Figure 2) This residual pool is expected to adequately trap sediments and support fish, including bull trout, during the construction seasons.

(2) Fish Screening

The fish screen at the entrance to the diversion tunnel has been eliminated. The feasibility report indicated the intake to the diversion tunnel would be screened to exclude resident fish and bull trout from entering, where mortality is expected to be high. The feasibility report did include $360,000 for this feature, but no method to achieve screening. To satisfy fish screening criteria, the screen area would need to be approximately 3,500 square feet. Access to the diversion intake requires highly difficult and expensive saturation diving techniques due to the depths greater than 240 feet during screening construction. Due to size and 1/4-inch bar spacing, it would be impossible to keep the structure free of debris and sedimentation; consequently, even if feasible, an underwater screen cleaner could not be maintained.

Another alternative, a net structure around the entrance, is estimated to cost more than $13,000,000 to construct and maintain. Debris and sediment would be dealt with by annually removing and cleaning or replacing the netting. A barge and specialized divers would be required for this type of maintenance. Removing debris with divers could only be performed with the diversion gates closed and could not be accomplished whenever significant plugging occurred. Significant plugging or accumulated debris would likely breach the net and compromise the screening ability. Other alternatives considered were also not technically feasible. Due to the uncertain performance and the cost, fish screening is considered infeasible. As an alternative to screening, a plan to trap fish upstream and downstream of Cougar Reservoir has

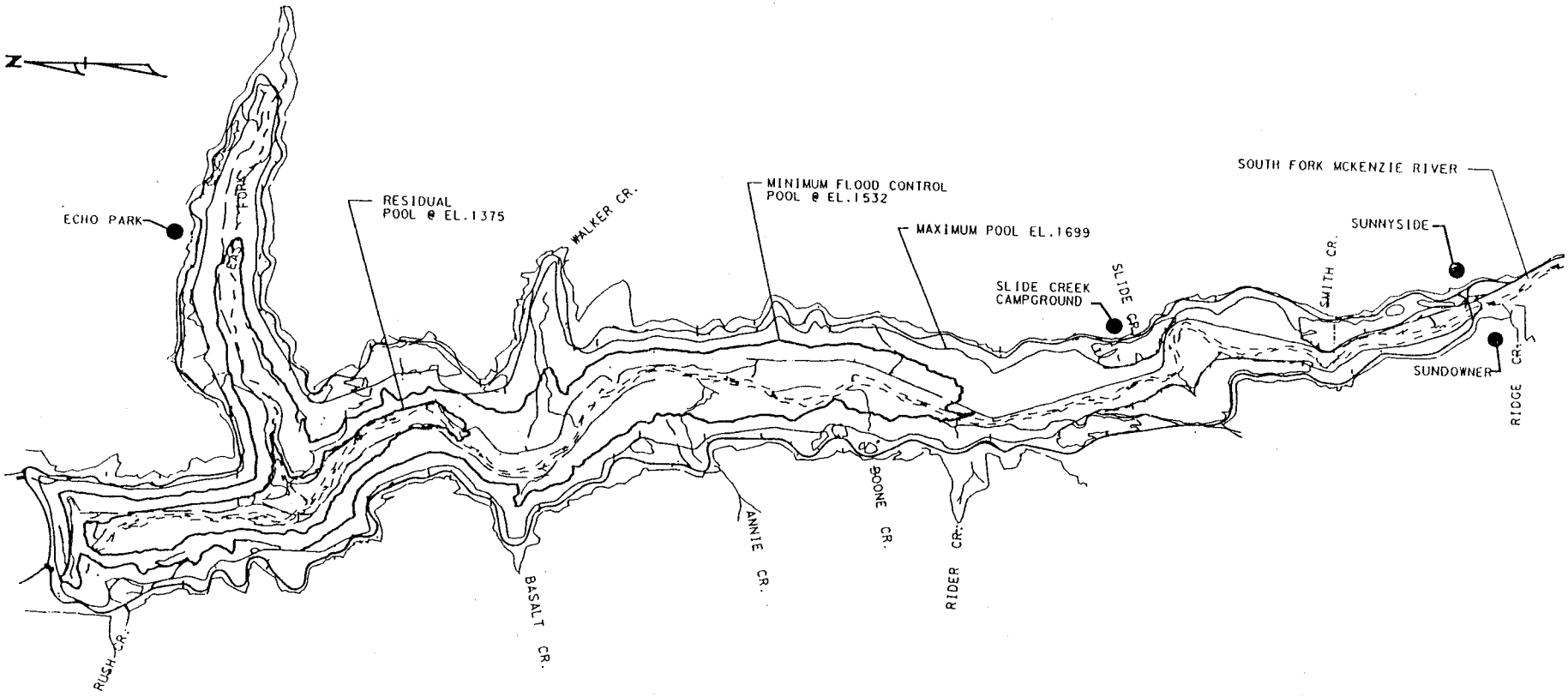


Figure 2

Cougar Lake
Pool Elevations

been discussed and coordinated with the agencies. During this coordination, it was decided not to trap bull trout the first year of construction, but to monitor them in the residual pool. Trapping remains under consideration pending monitoring results. Trapping below the dam and release above the reservoir is part of the mitigation plan to be implemented after construction.

(Fish screening of intake ports is outside the scope of this document. A study authorization has been added to the Water Resources Development Act of 1999 (WRDA) to address this issue. Under Section 344(b)(3), the Corps is to provide a report to Congress within 90 days of enactment of WRDA 1999 that includes a cost estimate for, and recommendations on the advisability of, adding fish screens to the project. The Corps has initiated a study based on regional interest in fish passage at Cougar Project in relation to ESA listings. Screening would be presented as part of this study.)

(3) Fish Trapping

Trapping of adult and juvenile bull trout both upstream and downstream of Cougar Reservoir was described in the FDM and the draft EA. Coordination with USFWS and ODFW during preparation of the Biological Assessment (BA) resulted in a modification of that plan. The Corps would continue to consult with USFWS to define reasonable and prudent mitigation actions necessary to protect bull trout during implementation of the Cougar WTC project. At present, mitigation measures that the Corps would implement include providing a residual pool for bull trout use during the construction period, and replacing an existing fish trap located below Cougar Dam with one suitable for capturing and transporting adult and subadult bull trout from below the dam to spawning and rearing areas located above the reservoir.

Water quality and biological monitoring would be performed during the construction period to identify problems that may arise and to provide valuable information useful for future project planning and design. Studies would be performed, beginning in the year 2000 prior to initial reservoir drawdown, to identify remedial actions that might be taken in the event that initial mitigation measures are ineffective, and to provide information needed for siting and design of fish trapping facilities. Biological monitoring during initial drawdown would be employed to detect any stranding of fishes that might occur, and to identify related needs for remedial action.

Alternative mitigation actions that could potentially be implemented to protect bull trout include trapping of adults and juveniles above Cougar Reservoir in an effort to reduce the

number of bull trout occurring in the residual pool during the summer drawdown and construction period. Unfortunately, techniques for safely trapping, handling, transporting, and holding bull trout have not been well developed. If the residual pool habitat is found to be benign following the initial drawdown period, alternative mitigation could include early supplementation of bull trout spawning above the reservoir through trapping and transport of spawners from below Cougar Dam during subsequent drawdown and construction periods.

The Corps will work with ODFW to study the movement of bull trout into and out of Cougar Reservoir and the area below Cougar Dam. The Corps will also work with ODFW to test trapping techniques for bull trout above and within the reservoir and below the dam. Studies will be initiated during the year 2000; 1 year prior to initial drawdown for construction activities. If feasible (based on potential sample size and likely resulting accuracy of information obtained), behavior of bull trout within the reservoir will also be examined. The intent of the study is to provide the Corps with information regarding an acceptable alternative protection strategy (i.e., trapping within or above the reservoir) that can be taken if necessary to protect bull trout, and with information pertinent to siting and design of trap-and-haul facilities for bull trout below (and, potentially, above) the dam.

An Environmental Coordination Task Force (ECTF) consisting of federal and state regulatory agency representatives would be established to assist the Corps in reviewing study and monitoring results. The ECTF would also assist the Corps in identifying needs for corrective action, formulating recommendations for facility design and corrective action, implementing corrective actions, and providing information concerning the project to their constituencies and to the public. Initially, the ECTF would meet on a quarterly basis, or as needed to address project needs.

Implementation of alternative protective actions for bull trout (i.e., trapping within or above the reservoir) during the construction phase of the Cougar WTC project would depend on whether the protection provided as a result of maintaining a residual pool behind Cougar Dam during the construction period proved to be an adequate protective measure. The study would examine bull trout migratory behavior, capture and handling techniques, and captive broodstock retention techniques. The Corps would ask the ECTF to review and comment on the study plan and on the results and recommendations from the study. USFWS

approval of the study plan, and of any resulting course of action, would be required.

Once biological objectives, and associated facility design criteria, for reconnecting bull trout subpopulations located above and below Cougar Reservoir, and for re-establishing natural anadromous spring chinook salmon production above Cougar Reservoir, have been defined by USFWS and by NMFS, respectively, a permanent fish trapping facility would be designed and constructed by the Corps below Cougar Dam. If needed (and approved by Congress), another facility would be designed and constructed above the dam. Experimental trapping (presumably, by ODFW) would be used to provide information needed for design and siting of the permanent trapping facility.

Downstream trapping would be done by rebuilding the remains of the existing fish trap on the powerhouse channel into a fish barrier dam to prevent bull trout from going up the channel. Fish will be attracted into the fish way entrance and then held in a holding tank until the tank is lifted by crane and put on a truck for transport to an upstream release site. The frequency of operation will depend upon the number of fish collected. The downstream trapping operation is not expected to start until the temperature control project at the reservoir is complete and fish can be reintroduced upstream safely. The downstream collection facility will remain operational after project construction to ensure that the upstream population is reestablished.

(4) Intake Structure

Cofferdam. A cofferdam (Figure 3) has been added in the approach channel to the intake structure. A portion of the existing embankment dam forms a basin in which the intake structure is located. The feasibility report assumed this basin would remain dry until the reservoir overtopped the lip of the basin. Photos of the basin taken during the original filling of the reservoir show that portions of the basin are porous. Without a cofferdam, the construction area has an 80 percent chance of being flooded each year. The cofferdam will protect the construction area to a reservoir elevation of 1,495 feet, reducing the chance of flooding the work area to less than 2.9 percent each construction season. The cofferdam will most likely consist of roller-compacted concrete (RCC). The upstream face would be vertical with a conventional concrete facing. The downstream face would likely be unformed and constructed on a 1 on 0.8 slope, the angle of repose of the RCC. The part of the cofferdam above the regulating outlet (RO) bench would be

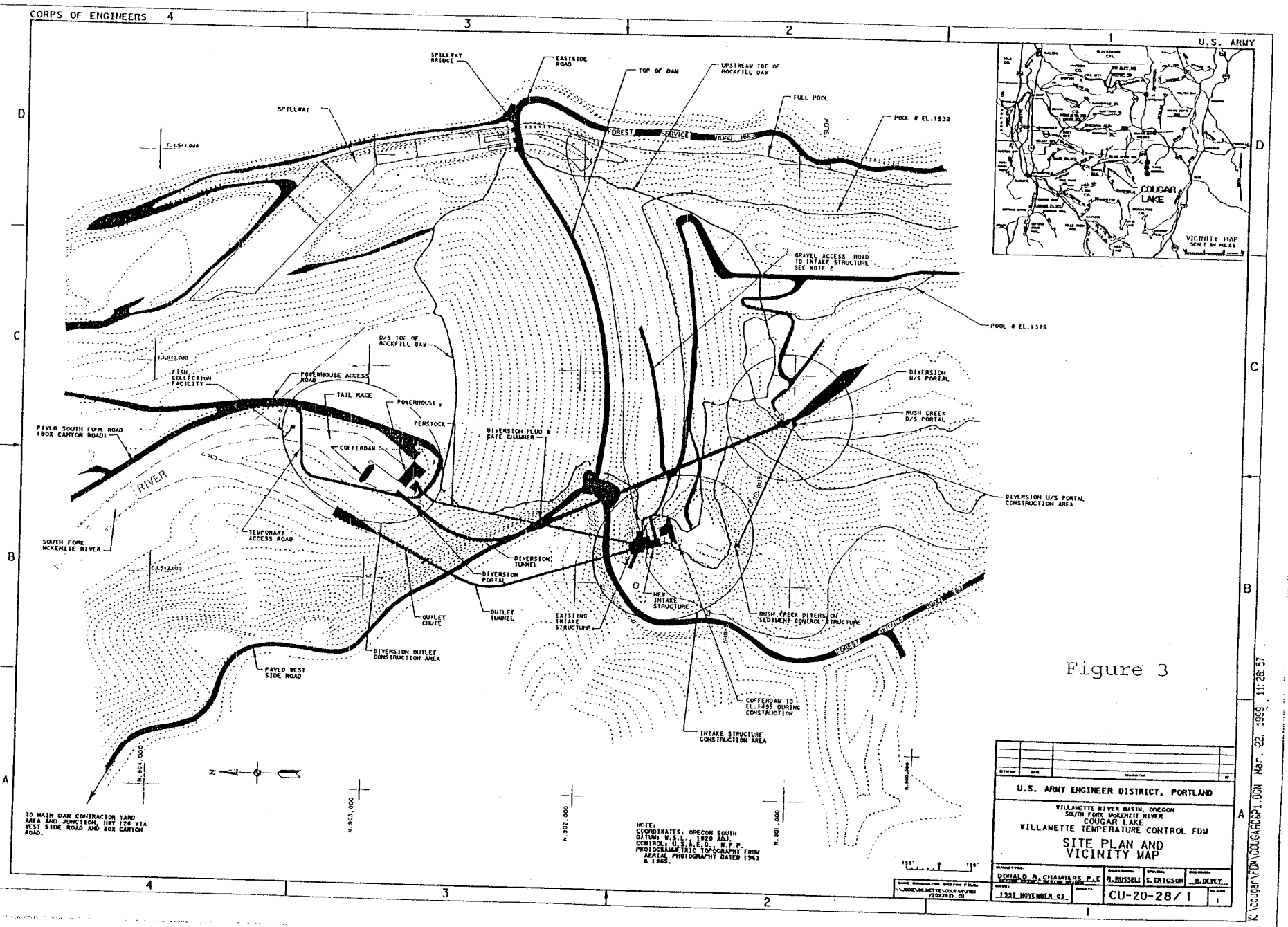

CORPS OF ENGINEERS
U.S. ARMY
SPILLWAY BRIDGE
EASTSIDE ROAD
TOP OF DAM
UPSTREAM TOE OF ROCKFILL DAM
FULL POOL
POOL @ EL.1532
SPILLWAY
FOREST SERVICE ROAD 1663
GRAVEL ACCESS ROAD TO INTAKE STRUCTURE SEE NOTE 2
POOL @ EL.1315
D/S TOE OF ROCKFILL DAM
FISH COLLECTION FACILITY
POWERHOUSE ACCESS ROAD
TAIL RACE
POWERHOUSE
PENSTOCK
DIVERSION PLUG & GATE CHAMBER
DIVERSION U/S PORTAL
RUSH CREEK D/S PORTAL
PAVED SOUTH FORK ROAD (BOX CANYON ROAD)
COFFERDAM
RIVER
DIVERSION U/S PORTAL CONSTRUCTION AREA
SOUTH FORK MCKENZIE RIVER
TEMPORARY ACCESS ROAD
DIVERSION TUNNEL
DIVERSION PORTAL
NEW INTAKE STRUCTURE
OUTLET CONDUIT
OUTLET TUNNEL
EXISTING INTAKE STRUCTURE
RUSH CREEK DIVERSION SEDIMENT CONTROL STRUCTURE
FOREST SERVICE ROAD 57
DIVERSION OUTLET CONSTRUCTION AREA
PAVED WEST SIDE ROAD
COFFERDAM TO EL.1495 DURING CONSTRUCTION
INTAKE STRUCTURE CONSTRUCTION AREA
TO MAIN DAM CONTRACTOR YARD AREA AND JUNCTION, HWY 126 VIA WEST SIDE ROAD AND BOX CANYON ROAD.
N.904,000
N.903,000
N.902,000
N.901,000
N.900,000
NOTE:
COORDINATES: OREGON SOUTH
DATUM: N.S.L. 1929 ADJ.
CONTROL: U.S.A.E.D. N.P.P.
PHOTOGRAMMETRIC TOPOGRAPHY FROM AERIAL PHOTOGRAPHY DATED 1963 & 1969.
VICINITY MAP
SCALE IN MILES
COUGAR LAKE
U.S. ARMY ENGINEER DISTRICT, PORTLAND
WILLAMETTE RIVER BASIN, OREGON
SOUTH FORK McKENZIE RIVER
COUGAR LAKE
WILLAMETTE TEMPERATURE CONTROL FDM
SITE PLAN AND VICINITY MAP
DONALD R. CHAMBERS P.E
R.RUSSELL
S.ERICSON
R.DEREY
1997 NOVEMBER 03
CU-20-28/1
K:\cougar\FDM\COUGARDGP1.DGN Mar 22, 1999, 11:28:57

Figure 3

removed at the end of the construction work and disposed, probably on site. The lower part, with a footprint of about 5,200 square feet, would be left in place after construction, to keep sediments from accumulating at the intake structure.

(5) Access Over Diversion Downstream Channel

Continued maintenance operations in the regulating outlet discharge area are required during the construction contract period. A temporary bridge was proposed in the FDM as required until the service road to the regulating outlet area is rebuilt. Subsequently, it has been determined that construction is possible behind the powerhouse, without requiring the temporary bridge. The permanent road will cross the diversion channel over a box culvert placed in an existing fill.

(6) Cofferdam at Downstream Portal

A cofferdam (Figure 3) is required in the tailwater to dewater the entrance to the downstream portal of the diversion tunnel. This cofferdam, made of earth, would be removed after the first year of construction. The cofferdam will be about 120 feet long by 12 feet high with its crest at elevation (El.) 1,260 feet with approximate volume of 1,100 cubic feet and footprint of 5,200 square feet. Material to construct this cofferdam would be from a local source, location unknown at this time, but possibly from Strube Flats. Environmental clearances for use of material from undisturbed areas at Strube Flats would be part of the USFS permitting process. Removal would be by clamshell or other earth-moving equipment. Placement of removed material would probably be at Strube Flats.

(7) Rush Creek Diversion

A small structure at the entrance to the Rush Creek diversion tunnel will prevent debris and large rocks from entering the tunnel. Debris and large rock could block the tunnel especially during the flood control season. The structure will form a small settling basin to trap sediment and screen the entrance to the tunnel. Rush Creek Diversion was described in the Feasibility Report, but not specifically in the EIS, thus it is fully described in this EA, along with some design changes.

(8) Debris Removal

Floating debris which interferes with project construction and operation would be removed by the contractor during construction. Significant debris accumulation above low pool, refloated upon water-up at completion of the action, would also

be removed. Woody material would be disposed properly, by recycling, making it available for camp fires or possibly burning on site.

(9) Erosion Control

Erosion and sediment control measures will be constructed only in work areas disturbed by equipment. Protection of exposed lake bed areas from people will be accomplished by posting warning signs and restricting vehicle access. Seeding slopes of less than 15 percent grade was considered and described in the EIS; however, periodic pool fluctuations would drown dryland grasses, and not provide water over a long enough duration to support wetland grasses. The growing season is also too short to offer much protection. However, the Corps has agreed to work with the USFS to see if annual seeding mixtures would take root and provide some protection from erosion. For purposes of this EA, it is assumed seeding would not be beneficial, thus estimates of sediment remain as a "worst case" situation. Constructed erosion control measures such as silt fences, berming, and settling ponds are too costly to construct for hundreds of acres of the drawn-down lake bed. Materials in the pool drawdown zone have been tested at several sites. The sediment is sandy, clayey silt, free of contaminants. The larger residual pool is expected to trap eroded sediments of larger than colloidal size. Monitoring planned for downstream of the dam would alert the Corps to unexpected turbidity. Location and treatment of specific problem sites could then occur. For specific problems, the Corps would utilize reasonable and prudent best management practices (BMPs) within our authority to do so.

AFFECTED ENVIRONMENT

A general description of the natural and human environment was contained in the above referenced EIS. Very few changes have occurred in the affected environment, other than listing of the bull trout as threatened under the Endangered Species Act, and listing of the Upper Willamette chinook and Upper Willamette steelhead as threatened. Also, a northern spotted owl nest has been located near the construction site. Canada lynx has been proposed for listing as threatened (July 1998). The South Fork McKenzie River watershed provides suitable foraging habitat for lynx. Early successional forest cover in the project area may provide winter prey habitat; however, denning is more likely to occur at higher elevations than are found in the project area. ESA listed steelhead do not occur in the project area. Peregrine falcon has been de-listed. The Oregon Department of

Environmental Quality (ODEQ) has listed the McKenzie River and the South Fork of the McKenzie (1998 303(d) list) as water quality limited-temperature due to requirements of bull trout not being met (i.e.: too warm in summer, too cold in spring).

Bull trout Although critical habitat for bull trout has not yet been designated by the USFWS, "the present or threatened destruction, modification, or curtailment of bull trout habitat" was identified by USFWS as one of the principle factors affecting the species (63 FR 31647). The three subpopulations of bull trout identified by USFWS that occur in the McKenzie River Basin constitute the last remaining population group in Oregon west of the Cascade Mountain Range. The lower McKenzie River bull trout subpopulation is distributed in the McKenzie River and its tributaries from the mouth (but primarily from above Leaburg Dam) upstream to Trailbridge Dam on the mainstem and to Cougar Dam on the South Fork McKenzie River (SFMR). The McKenzie River subpopulation is distributed in the McKenzie River and its tributaries above Trailbridge Dam up to Tamolitch Falls, a natural barrier (Buchanan et al. 1997). This subpopulation is currently isolated from the other two subpopulations by Trailbridge Dam. The SFMR subpopulation is distributed in the South Fork McKenzie River and its tributaries above Cougar Dam, and is currently isolated from the other to subpopulations by the dam.

The abundance of mature bull trout in the entire McKenzie River Basin has been estimated at less than 300 individuals (63 FR 31647). The lower McKenzie River subpopulation is the most robust of the three subpopulations. Spawning activity has been documented in Anderson and Olallie creeks, with an estimated average annual production of approximately 22,000 fry from 1997 through 1999. In addition, juvenile trapping by ODFW resulted in an average expanded catch of 289 yearling and older fish occurring in Anderson Creek over the period 1994 through 1998 (ODFW 1999). Based on an increasing trend in redd counts, large numbers of juvenile fish, an increase in the availability and use of spawning habitat in Olallie Creek, and the potential for re-connecting the basin's three subpopulations, the USFWS does not consider the lower McKenzie subpopulation to be at high risk of extinction.

Relatively few bull trout occur in the SFMR below Cougar Dam. However, ODFW has stated that anglers catch bull trout in the SFMR on a fairly regular basis (Jeff Ziller, ODFW Springfield, personal communication). While spawning does not occur in this area, rearing of adult and subadult fish (age 2-3) does occur.

The McKenzie River subpopulation above Trailbridge Dam is considered by USFWS to be at high risk of extinction due to isolation, suspected low population abundance, lack of documented spawning activity, and paucity of available spawning habitat.

All of the occupied habitat in the McKenzie Basin is obviously critical to the persistence of this population group. Spawning activity in the South Fork McKenzie River (SFMR) subpopulation has been documented in the Roaring River (Buchanan et al. 1997). Redd counts have been extremely low. The USFWS considers the SFMR subpopulation to be at high risk of extinction because of isolation, low abundance and limited spawning habitat.

Northern spotted owl Three northern spotted owl activity areas were described in the 1994 BA (USACE 1995). Two of these sites were located more than a mile from Cougar Dam, and the third site was in the Rush Creek watershed, approximately three-fourths mile from the project area. Although spotted owl pairs have been observed in the Rush Creek watershed almost every year since 1984, nesting was not confirmed in most years that surveys were completed (R. Seitz, pers. comm. 23 August 1999). Moreover, the activity area moved, apparently in response to logging operations in the upper watershed. A fourth spotted owl activity area was established in the Rush Creek watershed in 1998 (Ibid.). Nesting was confirmed at this site in 1998 but not in 1999. The nest was located less than one-half mile from the Rush Creek diversion tunnel intake. Spotted owl pairs have been observed south of this location in previous years.

Hatchery chinook In addition to changes in listed species, a land-locked population of hatchery chinook salmon were introduced into the South Fork McKenzie watershed by ODFW in 1996. Some of these salmonids presently inhabit Cougar Reservoir. This population is not a part of the listed stock. Some individuals have escaped the reservoir through the RO, and may return return from the ocean as adults via the South Fork below the dam.

ENVIRONMENTAL EFFECTS

Changes in the design as noted above change the immediate effects to bull trout, but not the long-term effects. It is now expected that some bull trout would remain in the residual pool during the 3- to 4-year construction period. Monitoring would occur the first year, and, if the fish are being stressed, upstream trapping may occur in subsequent years. If bull trout are trapped upstream of the reservoir, they could be released

downstream, to be recaptured and reintroduced after construction is completed or maintained somewhere and reintroduced after construction is completed. Other measures to mitigate potential impacts may be implemented depending on the final plan agreed to by the Corps and USFWS. (See discussion below.) Impacts to spring chinook are not expected to change from those described in the FEIS; however, the Corps determination of effect in the updated biological assessment has changed from no effect to may adversely affect.

Impact of Rush Creek Diversion: Rush Creek enters the reservoir near the intake structure and was diverted into a tunnel during construction of the reservoir. Diversion of Rush Creek back into the reservoir requires the removal of any rock and debris that blocks the diversion structure. This could cause additional sediments and turbidity within the residual pool. This material is expected to settle out in the residual pool, thus no particular impacts are expected from this action. An intake portal would be constructed to protect the diversion from additional debris.

Impacts of New Cofferdams The two cofferdams now part of the design would each cover 5,200 square feet of benthic area. The cofferdam within the pool area by the intake tower constitutes a permanent fill as only the top portion would be removed after construction is complete. Removed chunks of concrete would be left on the reservoir floor next to the remaining portion of the cofferdam. The earthen cofferdam in the downstream spillway exit constitutes a temporary fill as it would be removed after construction and materials disposed at the Strube Flats construction area. Neither cofferdam is expected to specifically impact the environment since they are part of the on-going construction activities, other than some minor, short-term disruption of benthic habitat.

Impacts of Erosion Less erosion control on exposed reservoir slopes is now proposed. Seeding or spreading erosion control materials was determined to be infeasible at the design stage. It is expected that more sediments would erode during summer storms and construction drawdown than was projected in the EIS. However, the residual pool is larger (106 acres with 2,485 ac.ft. of volume vs. 48 acres and 900 ac.ft. of volume) and would have greater capacity to trap non-colloidal sediments. Existing sediments in the reservoir would be eroded and transported into the residual pool, where heavier sediments would fall out of suspension. Based on the sediment sample particle size distribution and bedload prediction results (FDM,1998), 50 percent of the transported material (about 1

million cy) will fall out of suspension very quickly as the river intersects the residual pool. This material, which contains most of the sand and larger sized particles that are available for transport, is expected to be transported no more than 500 to 1,000 feet downstream of the intersection of the river with the residual pool.

The remaining material (about 1 million cy), which is comprised of particles smaller than 0.074 mm, will either fall out of suspension into the lake or be transported through the proposed diversion structure. Particles between 0.01 and 0.074 mm in diameter, which make up 900,000 cy (90 percent of the remaining 1 million cy), are expected to deposit in the pool. Particles less than 0.01 mm in diameter, which make up 100,000 cy of the remaining material, are expected to pass through the residual pool and on downstream. While this colloidal material will increase turbidity, possibly causing a visual change, adverse impacts to aquatic life are not expected. Since drawdown will occur in the winter/spring when flows are high, the material has much less chance of silting-in habitat. The energy of the high flows will likely resuspend any settled material and carry it downstream to the Willamette River. Thus, direct impacts to spring chinook pre-spawners and juvenile fish from high turbidity levels, and impacts to spawning gravel from compaction with fine sediments, should be negligible. The possibility remains, however, that some chinook eggs and alevins (salmon hatchlings with unabsorbed yolk) could be affected by silt.

The 900,000 cy of sediment, if deposited uniformly in the residual pool, would result in a sediment deposition thickness of about 5 feet. Localized eddies and quiescent zones will vary the thickness of the deposition layer. It is estimated that the sediment deposits could vary from less than 2 feet up to 10 feet, depending on these localized eddies and quiescent zones. Most of the sediment will likely be transported the first construction year as high flows rapidly cut through the newly exposed fine sediment. Each following year the supply of sediment will diminish; however, a flood event would transport large amounts of sediment no matter if it occurred early or late in the 4-year construction period. (See the FDM No. 21, 1998, for additional discussion of sediments.) The movement of sediments closer to the dam is expected to increase the life of the reservoir project, as it would allow for increased deposition in future years in the upstream reservoir area.

The Corps has agreed to conduct water quality monitoring during construction. Should this monitoring indicate an unexpected

erosional problem, the Corps will institute reasonable and prudent BMPs within our authority to reduce/resolve the problem.

Impacts to Bull Trout Potential impacts may occur to all life history stages of bull trout located within the residual pool, and above and below Cougar Dam in the South Fork McKenzie River. A relatively large residual pool (2,845 acre-feet, 1.5 miles long, 85 feet deep) would be provided for bull trout remaining in Cougar Reservoir during the drawdown and construction period (June through October). Turbidity within the residual pool is not likely to be a problem, given the size of the pool in relation to the potential sediment load from upstream and the small chance of heavy precipitation events during the drawdown period.

Water temperatures within the residual pool may be problematic. However, bull trout have been observed to migrate upstream out of Cougar Reservoir in April and May before reservoir and river water temperatures become elevated. Few bull trout may remain in the residual pool during the construction season. Water quality and biological monitoring will be employed to determine if the residual pool provides adequate protection for bull trout during the initial drawdown period (June through October 2001). Alternative or additional mitigation measures, such as minimization of the occurrence of bull trout in the residual pool, may be undertaken in subsequent drawdown seasons to protect bull trout, if necessary and approved by USFWS.

Preliminary measures called for initiation of bull trout trapping above the reservoir 1 year prior to drawdown. Coordination with resource agencies resulted in the decision to monitor bull trout in the residual pool and implement experimental trapping during the first year of construction. Trapping to intercept migrants descending from spawning and rearing habitat located above the reservoir may be initiated in subsequent drawdown seasons if bull trout are overly stressed in the residual pool during the initial drawdown. If necessary, trapping would be continued during normal emigration periods (February through September, or as recommended) throughout the 3- to 4-year construction period according to a protocol recommended and approved by USFWS. Also, bull trout captured during trapping would be transported and released below Cougar Dam or retained as captive brood stock according to the protocol recommended and approved by USFWS. These measures are intended to minimize impacts to bull trout occurring in or above Cougar Reservoir that may result from implementation of the proposed construction project.

Drawdown of Cougar Reservoir for construction of the intake structure is likely to impact some unknown number of bull trout remaining in the reservoir which may pass through the diversion tunnel during drawdown and during subsequent maintenance of the residual pool. Bull trout remaining in the reservoir during the drawdown period may avoid passing through the diversion tunnel either by remaining in the residual pool, with a volume of 2,845 acre-feet, or by migrating upstream into the watershed above the reservoir.

The intake portal of the diversion tunnel will be at a depth of approximately 85 feet at the normal residual pool elevation of 1,375 feet NGVD. This depth may increase during flow events of 1,200 cfs or more that exceed the capacity of the diversion tunnel at elevation 1,375. Bull trout remaining in the residual pool are expected to be distributed primarily near the surface and in the littoral zone up to a depth of approximately 20-40 feet (June - August), where thermal stratification typically occurs during the summer period when construction will occur (i.e., June through October). This distribution would reduce the likelihood of bull trout entrainment into the diversion tunnel during most of the construction period (through August). As a result, the Corps anticipates that few bull trout remaining in Cougar Reservoir are likely to be negatively impacted.

Under drawdown conditions, stream flows and water temperature conditions occurring below Cougar Dam will be more natural and conducive to normal environmental conditions for indigenous fish populations, as discussed in the 1995 FEIS under potential impacts to spring chinook salmon. These conditions should be beneficial for bull trout rearing throughout the construction season. The more natural flow conditions and water temperatures that would occur below Cougar Dam during August and September would provide a better environment for adult bull trout migration than currently occurs under baseline conditions. The primary potential impact of changes in flow below Cougar Dam on bull trout productivity would be with regard to changes in habitat quantity available for adult and subadult (age 2-3) rearing in the South Fork McKenzie River. Bull trout are not common in the South Fork, but they are caught there on a regular basis by anglers (Jeff Ziller, ODFW Springfield, personal communication). Thus, it is unlikely that rearing habitat availability is limiting to bull trout productivity in the South Fork McKenzie River downstream of Cougar Dam.

Although flow volume in the South Fork and mainstem McKenzie River may be reduced somewhat in average to low flow years, stream temperatures during summer rearing and fall migration

periods will be improved and more natural (i.e., warmer in summer and cooler in fall) than current environmental conditions.

The Final EIS (USACE 1995) discusses effects on water temperature resulting from loss of riparian cover through the reservoir area under drawdown conditions. Flow and temperature modeling indicated that flows released from the residual pool above the dam would average approximately 58° to 63°F daily (only 3-6F° warmer than inflow temperatures) during the hottest summer month (i.e., August). Slightly increased water temperature conditions would be more conducive to the production of benthic invertebrates, and to the overall productivity of fishes occurring downstream of Cougar Dam in the South Fork McKenzie River.

Re-initiation of normal flood control operations in November would not have a different affect from current baseline conditions on bull trout located below Cougar Dam. Effects of irregular increases in turbidity below Cougar Dam resulting from erosion of sediments above the dam are expected to have little, if any, impact on fishes. Corps modeling indicated that flow energy below Cougar Dam would be more than adequate to keep clay particles discharged from the reservoir in suspension throughout flows through the South Fork and mainstem McKenzie rivers, especially during winter high-flow periods (USACE 1995). Many fishes, including salmon and trout, are able to withstand fairly high concentrations of turbidity (i.e., several thousand mg/l or JTUs) for relatively short time periods of a week or less (Newcombe and Jensen 1996; Newcombe and MacDonald 1991). Lloyd (1987) found that salmon and trout were able to tolerate concentrations of turbidity ranging from approximately 80 to 100 mg/l for extended periods. Thus, direct impacts to bull trout from high turbidity levels are unlikely. The effectiveness of bull trout foraging downstream of Cougar Dam on juvenile spring chinook salmon or on other prey might be reduced as a result of increased turbidity, but this impact may also be offset by the increased productivity of prey species resulting from slightly increased water temperatures.

As a result, generally improved environmental conditions for bull trout below Cougar Dam as a result of implementation of the proposed project are anticipated.

Mortality is likely to occur to an unknown number of bull trout that may pass through the diversion tunnel during drawdown and during subsequent maintenance of the residual pool. The depth of the residual pool above Cougar Dam maintained during

construction, together with the location of the diversion tunnel inlet at the deepest point in the residual pool, will minimize the likelihood of bull trout entrainment.

Environmental conditions below Cougar Dam during construction are expected to be better for bull trout than current baseline conditions. As a result, few if any negative impacts to bull trout located below the dam are anticipated. Bull trout occurrence, distribution, and productivity should be unaffected in that area.

Impacts to Chinook Salmon. Impacts to listed stock of chinook salmonids are not expected to change from those described in the 1995 FEIS. Since there is a possibility that eggs and alevins in the McKenzie River might be adversely affected by fines/colloidal sediments during drawdown or storm events, a determination of "may adversely affect" has been made. Landlocked hatchery salmonids introduced into the upper South Fork of the McKenzie could be lost if they exit the reservoir through the diversion tunnel.

Impacts to Northern Spotted Owls The proposed action will not remove spotted owl nesting, roosting, foraging or dispersal habitat. However, noise from traffic, equipment, construction, and blasting has the potential to disturb spotted owl foraging, roosting and nesting behavior. Rock material will be removed by blasting at three sites: the main diversion tunnel, Rush Creek diversion tunnel, and the Cougar Reservoir intake structure. Blasting activity will occur from early April to mid-June 2000, and from early April to mid-July 2001. Use of equipment such as rock drills, cranes, and earth-moving equipment will emit additional noise. These activities may result in harassment of the owls. The Corps has made a preliminary determination of may affect, likely to adversely affect, based on the possibility of disturbance, or harassment. Consultation with US Fish and Wildlife Service is required. Monitoring and mitigation (such as special mats to absorb blasting sound) will be a part of consultation. Suitable habitat for spotted owls within 1 mile of the project site will be annually surveyed, using established protocol, to determine occupancy and nesting activity. Noise levels will be monitored at a recording station, which will be located in the Rush Creek drainage, within one-half mile of the Rush Creek diversion tunnel intake and the Cougar Reservoir intake structure. Construction noise at the monitoring station will not be allowed to exceed 60 dBA. Noise during blasting will not exceed 90 dBC.

COORDINATION

Design changes have been coordinated with resource agencies via specific meetings with the bull trout working group and informational multi-agency meetings. This environmental assessment was coordinated through 30-day agency and public review. Comments were requested from:

U.S. Environmental Protection Agency
U.S. Department of Agriculture, Forest Service
U.S. Department of the Interior
Fish and Wildlife Service
National Marine Fisheries Service
Oregon Department of Environmental Quality
Oregon Division of State Lands
Oregon Department of Fish and Wildlife
various interest groups and other publics

Comments were received from three Federal agencies, one State agency and one interest group. Comments are summarized and responded to below. Requests for clarification and editorial comments are addressed in the final EA text. Comment letters are attached.

National Marine Fisheries Service (NMFS). Comment: NMFS summarized expected impacts to salmonids and disagreed with the Corps determination of not likely to adversely affect chinook salmon. Response. The Corps has revised the Biological Assessment in coordination with NMFS. Possible additional impacts to chinook salmon eggs and alevins have been added to the EA.

U.S. Forest Service (USFS). Comment. Changes to ported intake tower design should be shared by biologists in other resource agencies. Response. Concur. The Corps will make design changes available to other resource agencies. Comment. Explain further additional studies attached to WRDA 2000 [sic]. Response. Recent Congressional language in WRDA 1999, SEC. 344 Willamette River Temperature Control, McKenzie Subbasin, Oregon, states that:"... the Secretary shall also include a cost estimate for, and recommendations on the advisability of, adding fish screens to the project... ." Based on legislative history and regional priorities (reintroduction of spring chinook above Cougar Dam by ODFW in 1996 has resulted in large numbers of land-locked fish in the reservoir), the Corps has awarded a contract to prepare a report on fish passage, including screening intake ports. An Alternatives Report will be prepared

that addresses project specific alternatives to improve downstream passage survival of juvenile salmonids in conjunction with selective withdrawal, and presents a concept for collection and transportation of adult chinook returning to the project. The emphasis of the report will be to identify possible project migrant bypass (screening and/or other) alternatives for a permanent facility at the Cougar Dam Project. Possible alternatives may consider, but shall not be limited to, interior or exterior tower screening, floating exterior screening, floating or fixed surface collection, floating booms, barrier curtains and operational restrictions. Combinations of modifications and project operation may also be considered where overall project survival meets regional criteria. The report shall develop a broad range of downstream passage alternatives, evaluate, reduce and refine the alternatives and present relative costs. Potential requirements and costs to model and prototype field test bypass alternatives studied in this report are also part of this scope, but call for a much lesser detail. A reconnaissance level adult fish collection and transportation facility concept shall be developed which will capture major details and costs of design, siting, construction and operations. This report is expected to be completed by July 2000.

Comment. Where is the material to construct the earthen cofferdam to come from, and where will it be disposed? Response. Earth (soil, sand, silt) to construct this cofferdam will come from a local source, probably from an area at Strube Flats. (It may be selected by the contractor.) Disposal will likely be at Strube Flats. Comment. The Corps could use large debris to create shade and cover for fish. Response. Placing debris of shade value would be an annual event in limited areas. Cable and anchoring debris would be ineffective; cabled debris would be highly likely to pull out or be made ineffective when impacted by other floating debris or floated during periods of inundation. Comment. The Corps should consider options for annual seeding. Response. The decision to not seed was based on the short summer growing season and lack of rainfall. Seeding can not begin until spring rains abate and the sun reaches sufficient height to allow sunshine over the steep valley walls to provide warmth to the soil for seed germination, which would be in June. August, September and October are drought months for this area; lack of soil moisture will prevent root establishment needed erosion control (August 1999 has seen 0.10 inch of rain). Following the drought months, uncontrolled water-up will occur in November; one rainfall event can cause the pool to rise rapidly, which will provide erosion protection by inundation. Any newly established, inundated and drought stricken vegetation

would then be drowned-out. However, the Corps is willing to work with the USFS and apply selected seed mixtures the first year of drawdown. If adequate cover is achieved and the seeding is determined to be beneficial, then annual seeding would be continued the remaining drawdown years. Comment. Downstream monitoring of turbidity and temperature should occur until Cougar Dam returns to normal. Response. Concur. See additional discussion of monitoring in the final EA and response to comment from Oregon Department of Environmental Quality. Comment. What are water quality impacts to Eugene and EWEB? Response. Impacts were discussed in the 1995 FEIS; they are not expected to change due to design changes covered in this EA. Impacts to EWEB water treatment facilities during construction will depend on extent of summer storms. The main EWEB concern is increased water treatment cost at the Hayden Island Treatment Plant from turbidity. Occasional summer storms may cause sediment transport into the residual pool. Some fine-grained material may be kept in suspension and passed downstream. The resulting turbidity may be added to or diluted by mainstem McKenzie flows and by other flow inputs downstream of the project depending on the area of the McKenzie basin the storm affects and the intensity of the storm. During the winter the project will be normally operated and there should be no different impact than has been experienced in the past. Comment. Clarify that there are two sub-populations of bull trout. Response. Noted, and added to final EA. Comment. Clarify issues regarding bull trout. Response. Concur. Issues have been clarified in the final Biological Assessment and summarized in the EA. Comment. It is supposition to say that bull trout remaining in the residual pool will be distributed near the surface. Response. The structure and volume of the residual pool will be such that we expect it to stratify during the summer construction period. Currently, Cougar Reservoir begins to stratify each summer at a depth of from 5 feet to10 feet in April or May. The thermocline is forced downward during the summer to a depth of from 20 feet to 30 feet by October, after which stratification breaks up. Modeling of temperature profiles at depth in the residual pool (USACE 1995) suggested a similar stratification pattern beginning at a depth of approximately 5 feet (June) to 10 feet (September) with fairly uniform temperatures of from 60°F (June & September) to 62°F (July and August) occurring at and below a depth of approximately 35 feet.

The ways in which fish distribute in lakes and reservoirs, especially in summer during periods of thermal and chemical stratification, are well documented. Most species distribute near the thermocline where the water is both cool and well oxygenated, though some species or developmental stages (e.g.,

relatively small juveniles) prefer warmer temperatures, vegetated areas, or shallower, more protected habitats near the shoreline in the epilimnion above the thermocline. Fish species rarely distributed below the thermocline in the hypolimnion unless forced to do so because of high water temperatures occurring above the hypolimnion. Some species such as kokanee, walleye, and yellow perch are pelagic and may distribute in the water column well above the reservoir bottom, but most species are demersal, occurring on or near the bottom.

Goetz (1989) suggested optimum water temperatures for bull trout rearing of 44-46°F. Fraley and Shepard (1989) indicated that water temperature above 59°F is likely to limit bull trout distribution. Recent information regarding migratory behavior of bull trout suggests that adults overwintering in Cougar Reservoir may move upstream into spawning areas in the upper watershed above the reservoir during May (Jeff Ziller, ODFW, personal communication). Given the likely water temperature conditions in the residual pool and the preferred temperature range of bull trout, few if any bull trout may remain in the residual pool during the construction period.

Based on the facts that residual pool temperatures are likely to be uniform below a depth of 35 feet, that bull trout are opportunistic and voracious predators likely to be distributed where prey species would be most abundant, and that most species in reservoirs are distributed demersally in the vicinity of the thermocline, we conclude that bull trout remaining in the residual pool, if any, are most likely to occur at a depth of approximately 35 feet along the bottom (upper end) or perimeter (lower end) of the residual pool. This depth is relatively near the surface and away from the intake to the bypass tunnel at a depth of 85 feet near the dam. However, we concur that bull trout actively seeking a passage route to below Cougar Dam may seek out and become entrained in flow entering the bypass tunnel.

Comment. USFS biologist is concerned that conditions during drawdown will adversely affect bull trout below the dam. Response. The referenced text (pages 12-13 in draft EA) was referring to conditions in the mainstem McKenzie as well as the South Fork. Text has been clarified and expanded as it relates to the South Fork. Comment. Impacts to bull trout are unknown. It should be clearly stated that impacts may range from minor to severe. Response. While impacts are not known precisely, the biological assessment has been coordinated with USFWS. Impacts are not expected to be severe. They are expected to be minor with proposed mitigation. Comment. The EA should include a

statement that information is unavailable or incomplete as regards to mitigations for bull trout. Response. The Corps is continuing to consult with U.S. Fish and Wildlife Service to define reasonable and prudent mitigation actions necessary to protect bull trout during implementation of the Cougar Reservoir element of the Willamette Temperature Control Project. These actions have been described in the final EA. At present, mitigation measures include providing a residual pool for bull trout use during the construction period, monitoring bull trout in the pool, with back up trapping and transportation plans if needed, and replacing an existing fish trap located below Cougar Dam with one suitable for capturing and transporting adult bull trout from below the dam to spawning areas located above the reservoir.

U.S. Fish and Wildlife Service (USFWS). Comment. The draft EA lacks analysis of impacts to listed T&E species other than bull trout and chinook salmon. Response. Impacts to other species had been addressed in the 1995 FEIS. However, during review of the draft EA one species was de-listed and a northern spotted owl nest was located closer to construction areas than was the case in 1995. The final EA has been revised to address the current situation. Comment. USFWS does not concur with the Corps' preliminary determination of "not likely to adversely affect" bull trout. Response. The Corps has coordinated with the USFWS and revised the BA. The EA now reflects the Corps determination of "may adversely affect". Comment. Water quality information is inadequate. There is no support for the assumption that fine sediments will have little impact downstream of the dam. Response. Additional text has been added. See also the response to ODEQ comments. Comment. Statements in the EA about ODFW studies of bull trout are out of date. Response. References to studies have been updated and new studies added. Comment. How will the cofferdam be removed? Where will this material be disposed, and what are the effects of material disposal? Response. The coffer dam below the diversion tunnel portal will be constructed by earth-moving equipment using native soil from the construction laydown site at Strube Flats or from material provided by the contractor. It will be removed by similar equipment and placed back at Strube Flats in the same area from which it was excavated. Comment. Discuss trap and haul program for fish passage. Response. The Corps will design and construct a fish trap below Cougar Dam that is capable of safely capturing and transporting adult bull trout from below the dam to spawning areas located above the reservoir. We will coordinate with USFWS, NMFS, and ODFW regarding the design of the fish trap. We are currently investigating (i.e., a reconnaissance level study) the

possibility of designing a trap capable of capturing and transporting both bull trout and spring chinook salmon. We anticipate that ODFW will operate the trap. The Corps will maintain the trap and will provide trucks and equipment necessary for transporting fish that will be liberated above the reservoir. An annual operating plan will be developed jointly with NMFS, USFWS, and ODFW. It will be implemented by ODFW and the Corps.

Oregon Department of Environmental Quality (ODEQ). The project must maintain State water quality standards, particularly in regards to turbidity. Turbidity is anticipated from this project, but it is unlikely that turbidity downstream from the residual pool will be distinguishable from natural storm generated turbidity in the McKenzie River. If turbidity becomes a problem, the reason must be determined and BMPs instituted to solve the problem and minimize impacts. Short-term effects of turbidity appear to be outweighed by the overall benefits to the fisheries resource. Response. The Corps appreciates the monitoring suggestions provided by ODEQ. Turbidity monitoring will be conducted at the USGS gaging sites above and downstream from the dam. The sites will be set up by the Corps so that real-time flow and water quality data will be posted to a USGS and/or Corps WEB SITE. Temperature data will also be collected at both sites, and dissolved oxygen (DO) data will be collected at the downstream site. Monitoring will commence before construction begins and will continue beyond the construction period. During the construction season (April - September), the residual pool will be profiled from top to bottom on a weekly basis to measure temperature, pH, DO, percent DO saturation, turbidity, oxidation-reduction potential, total dissolved solids, and conductivity. Residual pool data will be available on request and posted on the District water quality WEB site. The exact details of water quality monitoring during construction will be finalized following input from resource agencies. Water quality monitoring requirements have been incorporated into the Biological Assessment.

Cascadia Wildlands Project. Comment. The Corps is urged to consider an alternative including fish passage as part of this action. Response. Fish passage was outside of the scope of the Willamette Temperature Control project as authorized by Congress. WRDA 1999 added instruction to the Corps to provide a cost estimate for fish screens. See response to USFS.

Consultation Requirements

a. Clean Water Act of 1977: Section 404 of the Clean Water Act will be complied with. A section 404(b)(1) evaluation was prepared for the original design, and has been amended for the design change which added two cofferdams. The Willamette River Temperature Control project has been exempted by Congress from the requirement to obtain water quality certification from the State under Section 404(r). The State of Oregon has been notified of this determination.

b. Coastal Zone Management Act: The proposed action is outside the coastal zone. A Coastal Zone Consistency Determination is not required.

c. Endangered Species Act of 1973, as amended: A biological assessment was prepared in 1995, with a determination of not likely to affect bald eagle, peregrine falcon, northern spotted owl, and Oregon chub. This assessment has been updated to remove the peregrine falcon, include Canada lynx and change the determination for northern spotted owl. With the exception of the spotted owl, the revised action is not likely to adversely affect these species. A new spotted owl nest has been located in the vicinity of construction/blasting activities, and a determination of "may affect; likely to adversely affect" (due to possible harassment from noise) has been prepared and submitted to USFWS. The Corps' preliminary determination of "will affect, but not likely to adversely affect," for bull trout was reviewed by USFWS and, after coordination, changed to "may affect, likely to adversely affect." There would be no effect on steelhead. An updated biological assessment has been prepared on Upper Willamette spring chinook, with a determination of "likely to adversely affect," and submitted to the National Marine Fisheries Service with a request for consultation. Long-term benefits to this species were described in the EIS. The possibility of fine silts adversely affecting eggs or alevins during construction resulted in the adverse determination. Long-term impacts related to operation of the WTC project will be addressed in a forth-coming BA on operation of the Corps' 13 reservoirs in the Willamette River valley.

Preliminary plans to protect bull trout called for trapping of adults and juveniles both above and below Cougar Reservoir in an effort to remove them from danger during drawdown. Coordination with resource agencies during preparation of the Biological Assessment resulted in a revised plan, which is described in detail in the BA. In summary, this plan includes provision of a residual pool, monitoring of bull trout conditions in the pool,

experimental trapping above the reservoir, back-up strategies to trap and protect bull trout in subsequent construction years if necessary, and biological and water quality monitoring. Trapping below the dam and reintroducing bull trout above the reservoir is planned following construction.

The Corps assisted in funding the USFWS, U.S. Forest Service (USFS), and Oregon Department of Fish and Wildlife (ODFW) to cooperatively investigate aspects of bull trout life history in the South Fork McKenzie River watershed above Cougar Reservoir. The study was intended to assist the Corps in identifying the most effective means of protecting bull trout. Continued Corps funding will permit examination of bull trout migratory behavior, capture and handling techniques, and captive broodstock retention techniques. The Corps will implement any additional measures necessary for protection of bull trout developed as a result of the study and approved for implementation by USFWS.

Permits for incidental take will be obtained from USFWS for northern spotted owl and bull trout, and from NMFS for spring chinook. The need for these permits is based on possible harassment of spotted owls and possible loss of individual fish (salmon eggs and alevins in the South Fork McKenzie River, and bull trout in the reservoir). Any take that does occur would be incidental and would not have a significant affect on the listed species.

d. Fish and Wildlife Coordination Act: The proposed action is in compliance with the requirements of this act.

e. Marine Protection, Research, and Sanctuaries Act of 1972, as amended: No marine resources would be affected by the proposed action.

f. Cultural Resources Acts: Design changes involve areas disturbed by original construction. Monitoring during construction for temperature control facilities has been agreed to by the Corps. This determination has been coordinated with the Oregon State Historic Preservation Office.

g. Wild and Scenic Rivers Act: The South Fork McKenzie River, a State Scenic Waterway, is under study by the U.S. Forest Service for inclusion in the National Wild and Scenic Rivers System. The USFS expressed concerns regarding impacts to bull trout relative to study river status in comments on the draft and final EIS; however, the USFS had not issued a final determination under section 7(b) of the act prior to

Congressional authorization and funding of the WTC project. A section 7 determination will not be issued after the Congressional action. The USFS continues to express concerns regarding the resolution of bull trout issues relative to the study river segments. The Corps will continue to work with the USFS, USFWS and ODFW to minimize impacts to bull trout in the South Fork McKenzie River.

h. Executive Order 11988, Flood Plain Management, 24 May 1977: The proposed repair would have no effect on the existing flood plain nor encourage further development in the flood plain.

i. Executive Order 11990, Protection of Wetlands: No wetlands would be affected by the proposed action.

j. Analysis of Impacts on Prime and Unique Farmlands: Not applicable.

k. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA). Pre-construction site investigation indicates that hazardous, toxic, or radioactive wastes (HTRW) are not expected to be a problem. Design changes covered by this EA do not change that determination. Sediment samples taken within the drawdown zone since publication of the EA indicate the sediments are sandy-silty material with no contaminants. Rock and concrete removed by blasting does not contain contaminates. Should any HTRW be discovered during construction, it would be responded to within the requirements of the law and USACE regulations and guidance.

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SECTION 404(b)(1) EVALUATION
COUGAR LAKE
WILLAMETTE TEMPERATURE CONTROL
LANE COUNTY, OREGON

I. Introduction

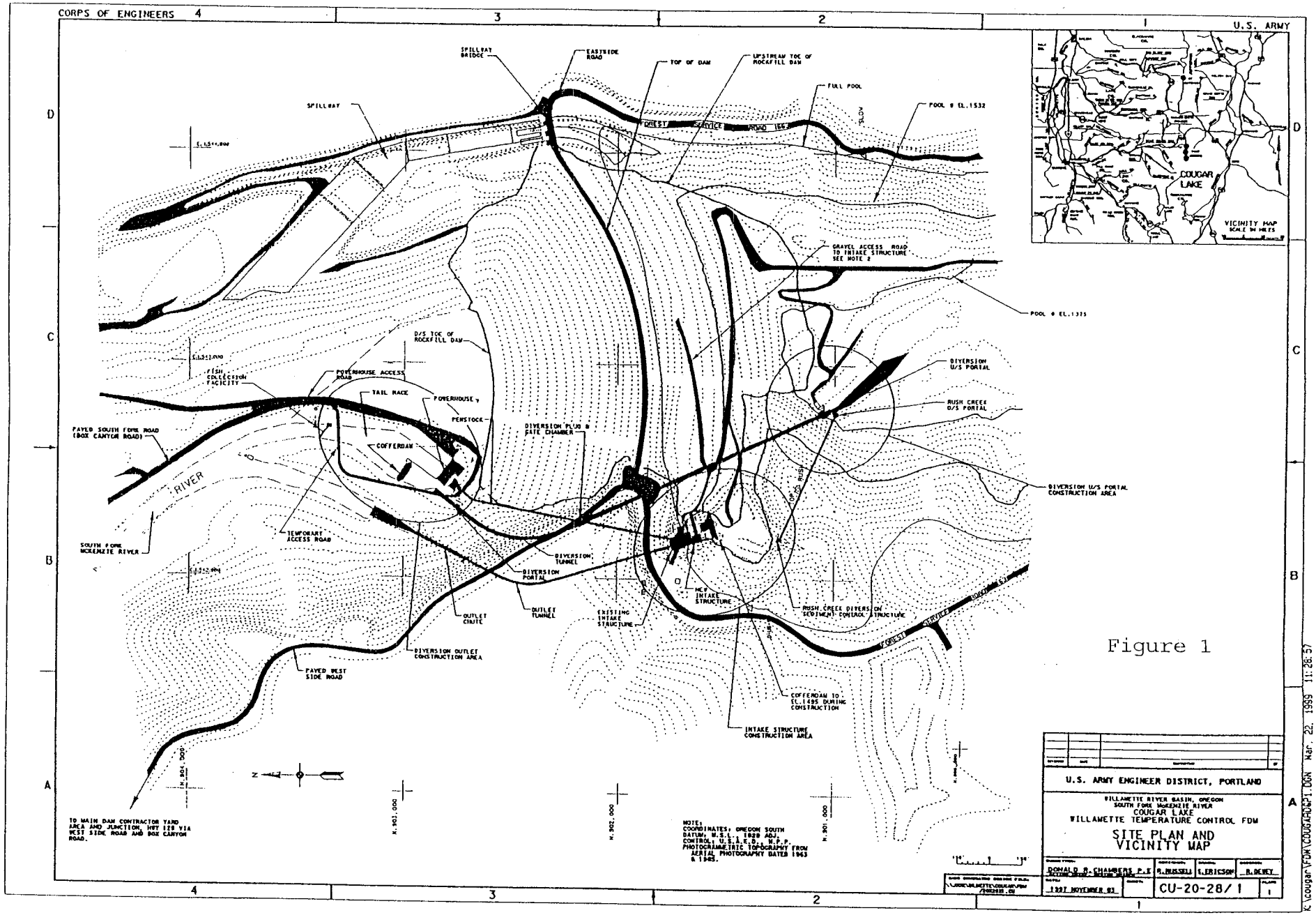
Section 404 of the Clean Water Act of 1977 requires that all civil works projects involving the discharge of dredged or fill material into waters of the United States be evaluated for water quality effects prior to making the discharge. This evaluation assesses the effects of fill, consisting of two cofferdam structures, to be constructed at Cougar Dam, on South Fork of the McKenzie River. The South Fork McKenzie is a tributary to the McKenzie River in Lane County, Oregon. A previous Section 404 evaluation was prepared and signed in April 1995 for other fill activities at the project. This evaluation reflects design changes made since that time. The Willamette Temperature Control project, McKenzie Subbasin, has a Section 404(r) exemption: State water quality certification is not required.

II. Description of the Proposed Activity

The preferred alternative is to provide temperature control at both Blue River and Cougar Dam projects, on a staggered schedule, and while maintaining flood control during the construction period. A staggered schedule reduces downstream flow impacts for the McKenzie River. A Feature Design Memorandum (FDM) for construction of temperature control facilities at Cougar Dam was prepared (July 1998) and that project is in plans and specification stage. Changes in design have resulted in the proposed placement of two cofferdams, one permanent, one temporary. The design elements and construction activities of these changes requiring fill in waters of the U.S. are summarized below. For more detail, refer to the accompanying Environmental Assessment and the FDM No. 21, July 31, 1998.

The Proposed Action was fully described in the 1995 Feasibility Report/EIS. Briefly, that action is to draw down Cougar Reservoir to near stream level for the four construction seasons, during which time a new, ported, multi-level intake tower will be constructed. Several changes are proposed, as a result of further design study. Some of these changes will alter the impacts previously described in the EIS. Only those changes that result in additional fill are discussed in this evaluation. Other design changes may be reviewed in the FDM. The specific changes addressed here are construction of two coffer dams (Figure 1).

1) A cofferdam has been added in the approach channel to the intake structure (Figure 2). A portion of the existing embankment dam forms a basin in which the intake structure is located. The feasibility report assumed this basin would remain dry until the reservoir overtopped the lip of the basin. Photos of the basin taken during the original filling of the reservoir show that


CORPS OF ENGINEERS
U.S. ARMY
SPILLWAY BRIDGE
EASTSIDE ROAD
TOP OF DAM
UPSTREAM TOE OF ROCKFILL DAM
FULL POOL
POOL @ EL.1532
SPILLWAY
FOREST SERVICE ROAD 166
GRAVEL ACCESS ROAD TO INTAKE STRUCTURE SEE NOTE 2
POOL @ EL.1375
D/S TOE OF ROCKFILL DAM
FISH COLLECTION FACILITY
POWERHOUSE ACCESS ROAD
TAIL RACE
POWERHOUSE
PENSTOCK
DIVERSION PLUG & GATE CHAMBER
COFFERDAM
PAVED SOUTH FORK ROAD (BOX CANYON ROAD)
RIVER
SOUTH FORK MCKENZIE RIVER
TEMPORARY ACCESS ROAD
DIVERSION U/S PORTAL
RUSH CREEK D/S PORTAL
DIVERSION U/S PORTAL CONSTRUCTION AREA
DIVERSION TUNNEL
DIVERSION PORTAL
OUTLET CHUTE
OUTLET TUNNEL
EXISTING INTAKE STRUCTURE
NEW INTAKE STRUCTURE
RUSH CREEK DIVERSION SEDIMENT CONTROL STRUCTURE
DIVERSION OUTLET CONSTRUCTION AREA
PAVED WEST SIDE ROAD
COFFERDAM TO EL.1495 DURING CONSTRUCTION
INTAKE STRUCTURE CONSTRUCTION AREA
TO MAIN DAM CONTRACTOR YARD AREA AND JUNCTION, HWY 128 VIA WEST SIDE ROAD AND BOX CANYON ROAD.
NOTE:
COORDINATES: OREGON SOUTH
DATUM: N.S.L. 1929 ADJ.
CONTROL: U.S.A.E.D., N.P.P.
PHOTOGRAMMETRIC TOPOGRAPHY FROM AERIAL PHOTOGRAPHY DATED 1963 & 1985.
COUGAR LAKE
VICINITY MAP
SCALE IN MILES
U.S. ARMY ENGINEER DISTRICT, PORTLAND
WILLAMETTE RIVER BASIN, OREGON
SOUTH FORK McKENZIE RIVER
COUGAR LAKE
WILLAMETTE TEMPERATURE CONTROL FDM
SITE PLAN AND VICINITY MAP
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1997 NOVEMBER 03
CU-20-28/1
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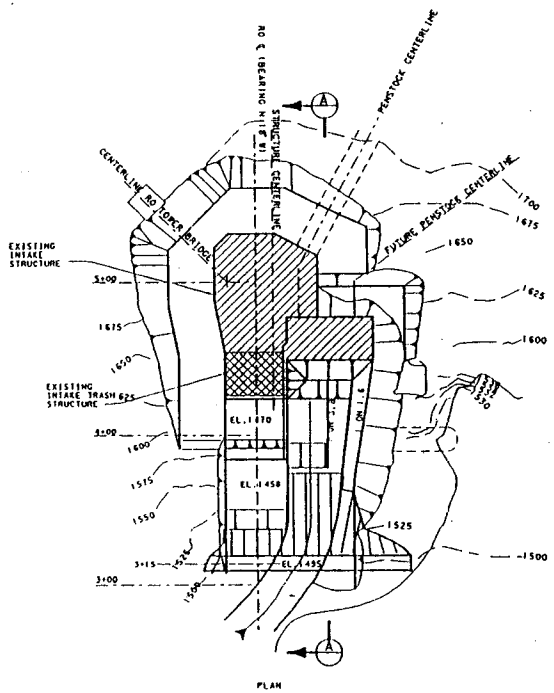
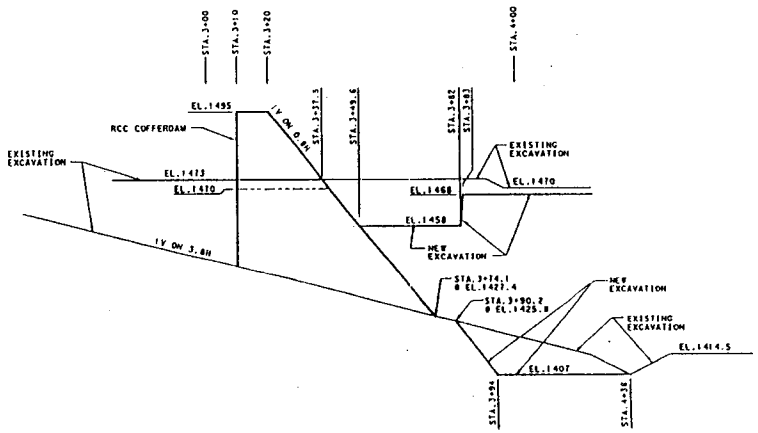
Figure 1

CORPS OF ENGINEERS U.S. ARMY



PLAN - EL.1495

SCALE: 1" = 30'



SECTION A

NOT TO SCALE

Figure 2

EXISTING CONCRETE

CONCRETE TO BE REMOVED TRASH RACK BRIDGE OMITTED

U.S. ARMY ENGINEER DISTRICT, PORTLAND

WILLAMETTE RIVER BASIN, OREGON
SOUTH FORK McKENZIE RIVER
COUGAR LAKE
WILLAMETTE TEMPERATURE CONTROL FOW
INTAKE STRUCTURE STRUCTURAL

COFFERDAM

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1997 NOVEMBER 03		CU-20-28/23	23

portions of the basin are porous. Without a cofferdam, the construction area has an 80 percent chance of being flooded each year. The cofferdam will protect the construction area for a reservoir elevation of 1,495, reducing the chance of flooding the work to less than 2.9 percent each construction season. The cofferdam will most likely consist of roller-compacted concrete. The upstream face would be vertical with a conventional concrete facing. The downstream face would likely be unformed and constructed on a 1 on 0.8 slope, the angle of repose of the RCC. The part of the cofferdam above the RO bench would be removed at the end of the construction work and disposed in situ. The lower part, with a footprint of about 5,200 square feet, would be left in place after construction.

2) A second cofferdam is required in the tailwater to dewater the entrance to the downstream portal. This cofferdam, constructed of earth, would be removed after the first year of construction. The earthen cofferdam will be about 120 feet long by 12 feet high with its crest at elevation (El.) 1,260 with approximate volume of 1,100 cubic feet and footprint of 5,200 square feet.

III. Description of the Fill Sites

1) Intake structure approach channel. The fill site is behind the dam and the existing regulating outlet located at the left abutment of the dam at rivermile 4.4 of the South Fork of the McKenzie River. Substrate is native rock.

2) Diversion tunnel portal channel. This fill site is a constructed channel on the downstream side of the dam adjacent to the powerhouse that rejoins the South Fork McKenzie River as it exits from the regulatory outlet.

IV. Factual Determinations

a. Physical Substrate Determinations

1) Intake structure. The substrate is primarily basalt, with andesite and/or tuff, covered with an estimated 6 feet of sediments accumulated over the 30 years since the dam was constructed.

2) Temporary cofferdam site. Once material was excavated from the old fill in front of the diversion portal, the re-opened channel would connect with the South Fork McKenzie backwater area behind the powerhouse. This channel would be rip rapped below ordinary high water to protect the sides from eroding due to the force of water exiting the diversion tunnel. The temporary cofferdam would be placed in this channel. This is a disturbed area; however, it is still waters of the United States.

b. Water Circulation, Fluctuation, and Salinity Determinations

The fill and disposal action would have little or no effect on water circulation, fluctuation, or salinity.

c. Suspended Particulate/Turbidity Determination

Short-term turbidity is expected to occur wherever sediments have been disturbed due to construction. Turbidity from sediment disturbance would be indistinguishable from turbidity related to reservoir operation.

d. Contaminant Determinations

Fill consisting of the intake structure coffer dam would be composed of concrete; the temporary coffer dam at the portal would be clean, native soil. As the intake structure site would be dry during construction and the concrete would be cured prior to refill, there would be no contamination of river water from the concrete. Some dust may occur during demolition of the top portion of the coffer dam; however, given the volume of water in the reservoir changes in pH would be insignificant. Clean, native soils would not contaminate the water below the diversion tunnel.

e. Aquatic Ecosystem and Organism Determinations

Impacts of fill and discharge to the structure and function of the aquatic ecosystem and organisms would be minor, in that the reservoirs would be drawn down to run-of-river and any existing aquatic ecosystem in the reservoirs would be disrupted. Some emergent vegetation would be destroyed during excavation of the diversion tunnel portal at Cougar and associated coffer dam. Chunks of concrete from the dismantled top portion of the intake coffer dam would provide structure for organisms.

f. Proposed Disposal Site Determinations

The fill material would not violate Environmental Protection Agency or State water quality standards. Relocation of sediments would not introduce substances into surrounding waters or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300 et seq.).

g. Determination of Cumulative effects on the Aquatic Ecosystem

The fill action is not expected to have significant adverse cumulative effects on the aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem

The proposed work would not cause any secondary effects on the aquatic ecosystem that could be isolated from the overall action.

V. Coordination

A draft environmental assessment (EA), describing the revised proposed action, has been prepared and is available for review. The overall proposed action was coordinated with appropriate Federal, State, and local resource agencies, organizations, and interested members of the public through a Notice of Intent to prepare the EIS (February 22, 1993), draft EIS and final EIS (April 1995). Comments on the EA were requested from:

U.S. Environmental Protection Agency
U.S. Department of Agriculture, Forest Service
U.S. Department of the Interior
Fish and Wildlife Service
National Marine Fisheries Service
Oregon Department of Environmental Quality
Oregon Division of State Lands
Oregon Department of Fish and Wildlife
various interest groups and other publics

Comment summaries and response to comments are part of the final EA. Oregon Department of Water Quality requested water quality monitoring, to which the Corps has agreed.

VI. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. The "no action" alternative was considered and rejected because it would not be responsive to fish needs in the area.

c. The proposed action is in compliance with applicable State water quality standards, with the exception of possible temporary exceedence of turbidity standards during construction, for which a variance will be sought if necessary.

d. The proposed action would not violate the toxic effluent standards of Section 307 of the Clean Water Act.

e. The specific fill action is not likely to adversely affect listed threatened or endangered species or their critical habitat. Biological assessments documenting this conclusion have been prepared and submitted to the U.S. Fish and Wildlife Service

(USFWS) and National Marine Fisheries Service (NMFS). The overall proposed action may have temporary adverse effects on bull trout and spring chinook, listed as threatened under the Endangered Species Act. The Corps of Engineers is coordinating with the USFWS and NMFS and will follow the recommended plan when it is available.

f. The proposed fill would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, and wildlife. Significant adverse effects on aquatic ecosystem diversity, productivity, and stability, and recreational, esthetic, and economic values would not occur.

g. Appropriate steps to minimize potential adverse impacts would be specified in the construction contracts.

With the inclusion of appropriate and practical conditions to minimize pollution and adverse effects to the aquatic ecosystem, the proposed action is specified as complying with the requirements of the Section 404(b)(1) guidelines.

Date: 30 Nov 99

RANDALL J. BUTLER
Colonel, EN
Commanding