State of Washington
Department of Ecology

WATER RESOURCES MANAGEMENT PROGRAM

WASHINGTON STATE WATER PROGRAM

W.W.I.R.P.P. SERIES - No. 4

GREEN-DUWAMISH RIVER BASIN

INSTREAM RESOURCES PROTECTION PROGRAM

Including

PROPOSED ADMINISTRATIVE RULES, AND

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

(WATER RESOURCE INVENTORY AREA 9)

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

JUNE 1980

Green-Duwamish River Basin
Instream Resources Protection Program
Including
Proposed Administrative Rules and
Supplemental Environmental Impact Statement
(Water Resources Inventory Area 9)

Prepared by
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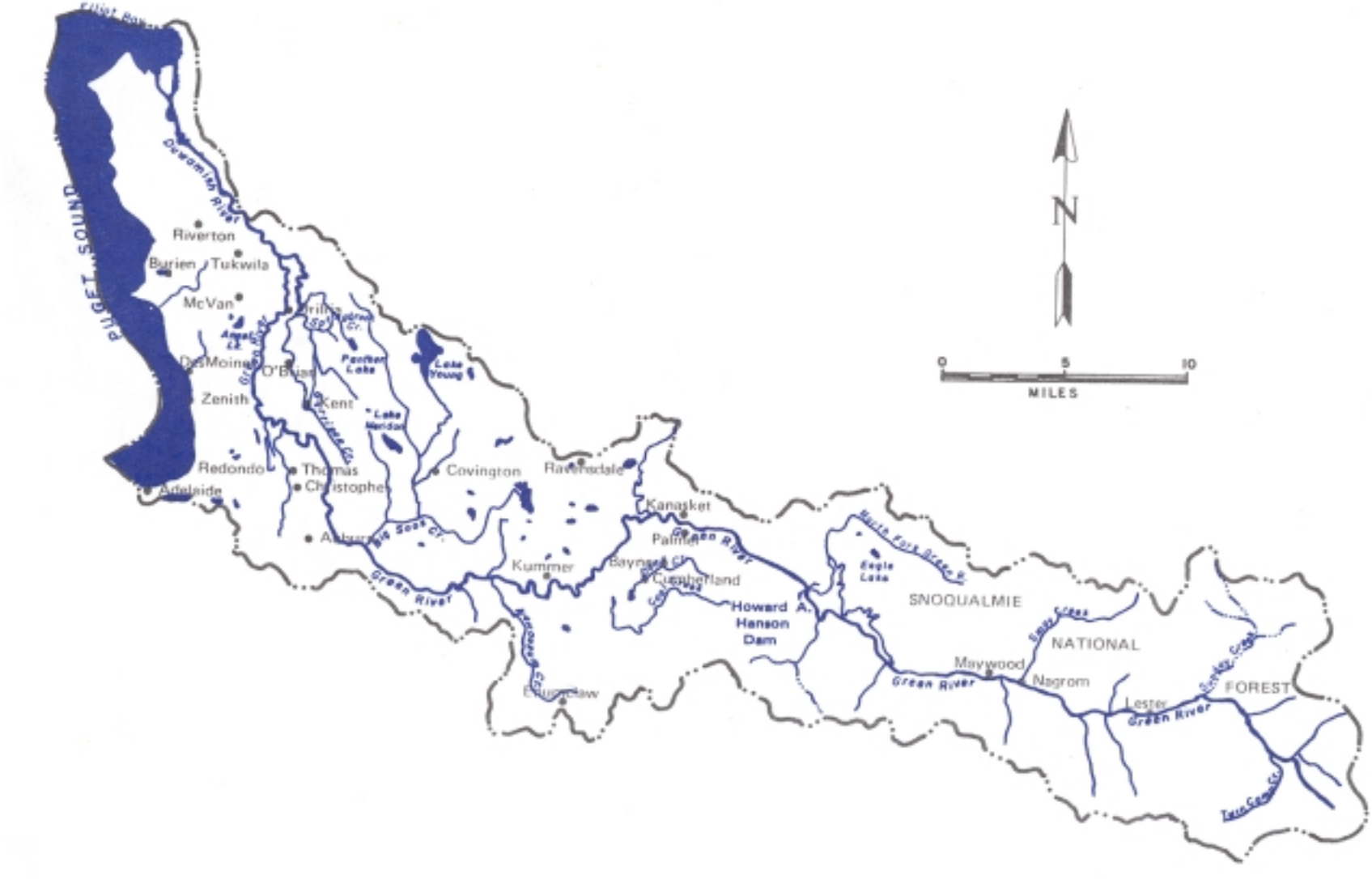

FIGURE 1. Streams and Lakes in the Green-Duwamish Water Resource Inventory Area (WRIA)

INTRODUCTION

The Western Washington Instream Resources Protection Program involves development of administrative rules for instream flows under chapter 90.54 RCW (Water Resources Act of 1971), chapter 90.22 RCW (Minimum Water Flows and Levels) and chapter 173-500 WAC (Water Resources Management Program) for the 26 Water Resource Inventory Areas (WRIA) found on the western slope of the Cascade Range. The Department of Ecology (DOE) has undertaken an analysis of the water resources of the Green-Duwamish River Basin and developed policies and procedures to protect instream resources values by proposing instream flows to minimize impacts resulting from future water appropriations. Under this proposal, an instream flow restriction has been placed on the main stem Green River. All tributaries of the Green River, as well as all other small streams in the basin would be closed to further appropriation. IN NO CASE WILL EXISTING WATER RIGHTS BE AFFECTED.

Flows in the Green River are controlled by a major flood storage project, the Howard A. Hanson Dam. The facility is operated with a low pool for flood storage during the winter high rainfall period. In the summer low flow period a conservation pool is maintained to allow low flow augmentation releases. This is designed to provide a minimum of 110 cfs for the benefit of the fishery resource. The City of Tacoma has a water supply diversion structure immediately below the dam. The flow releases from the dam, as provided in the authorization document from Congress, are considered by Fisheries and Game to be insufficient for the protection of instream resources. The agencies consider habitat requirements of major food fishes to be higher than the existing 110 cfs minimum flows. Fisheries and Game have requested supplemental augmentation of the low flows through reauthorization of Howard A. Hanson Dam. Fisheries and Game requests were considered in development of the proposed instream flows. This program is not a request to the Corps of Engineers to provide increased minimum releases from the authorized summer conservation pool.

The City of Tacoma has requested the Corps of Engineers to store water at Howard A. Hanson Dam for the purpose of additional municipal and industrial supply. Tacoma has also requested DOE to process a 1933 priority date water right application for the use of natural flow and the right to store public waters. If permitted, the use of the water would he conditioned with the instream flows established in Chapter 173-509 WAC. The instream flows are higher than the Corps of Engineers current minimum releases of 110 cfs, during the summer low flow period. When flows during that period cannot equal to or exceed 150 cfs, Tacoma would have to provide for continued supply from storage specifically designated for that purpose.

The department proposes that any existing storage flexibility in the current operation of Howard A. Hanson Dam, and excess inflow into the dam during the summer meet the proposed instream flows and to guarantee that the current minimum releases be prolonged later into the fall during abnormally dry weather. Reauthorization of Howard A. Hanson Dam can permanently accomplish supplemental low flow augmentation, following project feasibility analysis by the Corps, but this is not mandated of the Corps through this program. King County has requested action by the Corps of Engineers to initiate flood damage reduction either by levee or channel modification. Additional flood control storage or nonstructural alternatives could accomplish the flood damage reduction by allowing use of lower valley drainage projects during high flow storm periods.

The Instream Resources Protection Program is developed under a Department of Ecology methodology for determining flows. This hydrologically-based procedure provides varying degrees of protection levels for streams based on historical stream flow records. Instream flow hydrographs have been developed for two locations in the Green-Duwamish River Basin. Normal and critical year curves are supplied for one station only located at Palmer, WA. They are intended to apply to the proposed future release schedule of the Howard A. Hanson Dam to the extent practically and legally possible and the proposed City of Tacoma, Pipeline No. 5 diversion. Management of the normal and critical year curves will be the responsibility of the director or his designee, and violation of these flows or levels will only be allowed if overriding public interest will be served.

A public hearing on the proposed administrative rules, Chapter 173-509 WAC (Appendix A) was held in Auburn, WA, on February 7, 1980. Testimony was entered into the official public record. A comment period coincided with the hearing during which time DOE received numerous written comments. The City of Tacoma supplied a great deal of technical and planning studies which form part of the public record. DOE has reviewed all comments and supplied responses (appendices C, D, E, and F). The comments and responses are considered part of the final supplemental environment impact statement (Appendix B).

At the request of the City of Tacoma, and other interested parties, a workshop was held in Tacoma, on March 10-12, 1980 (Appendix G). The informal session was intended to provide technical information transfer and an indepth discussion of the proposed regulation. The effect of the instream flow program on the Corps of Engineers and the City of Tacoma was analyzed and the participants expressed a greater degree of understanding of the state program. The department received recommendations on clarifying language that could be used in the proposed administrative rules. After assembling these suggestions, a redrafted regulation was circulated by DOE for discussion purposes.

The proposed administrative rules were considered for adoption at an adoption proceeding held Tuesday, April 22, 1980 in Lacey, Washington. Several participants, including the Corps of Engineers, City of Tacoma, Bureau of Indian Affairs, and the Washington Department of Game requested a delay in adoption of the proposed administrative rules.

Following testimony it was announced that the adoption hearing would be continued for 45 days to allow all parties additional time to complete their review. During that period DOE met with the Department of Game and agreed to increase the proposed high flow period instream flows at Auburn to 650 cfs. The proposed administrative rules, Chapter 173-509 WAC were signed by the Deputy Director and adopted at the proceeding on June 5, 1980 at the council chamber, Lacey City Hall, Lacey, Washington.

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I. BACKGROUND

The Western Washington Instream Resources Protection Program develops and adopts administrative rules establishing instream resources protection measures for each Water Resource Inventory Area (WRIA) pursuant to chapter 00.54 RCW (Water Resources Act of 1971), chapter 90.22 RCW (Minimum Water Flows and Levels), and chapter 173-500 WAC (Water Resources Management Program). These administrative rules represent partial basin management programs that may be amended in the future to expand their scope. The Green-Duwamish Instream Resources Protection Program has provided an opportunity for public review of previous joint-agency actions that have closed all tributaries of the Green River to further appropriations. Storage projects may be approved that are not in conflict with the provisions of Chapter 173-509 WAC. The segment of the basin under the influence of tidal action, known as the Duwamish River, is not specifically provided for in the proposed administrative rules. Future water rights on the Green River will be subject to the instream flows set by this program.

PROGRAM OVERVIEW

A Final Environmental Impact Statement and Program Overview document addressing the entire Western Washington program has been drafted and circulated to the public and governmental agencies. (Copies are available from Department of Ecology (DOE), Mail Stop PV-11 Olympia.)1/ This document outlines the conceptual approach and technical procedures used to determine and adopt instream protection measures. The Green-Duwamish proposal is intended to implement this overall program.

Under the proposal, if any future consumptive water rights are granted in the main-stem Green River, they will be conditioned to instream flows at the control stations as determined herein, and as indicated in the accompanying administrative rules (see Appendix A). United States Geological Survey (USGS) gaging stations have been selected as control stations, providing a historical record of streamflow.

INSTREAM FLOWS

The Water Resources Act of 1971 provides that perennial streams arid rivers shall be retained with base flows (Chapter 90.54 RCW). The state may also establish minimum water flows or levels for streams, lakes or other public waters (Chapter 90.22 RCW). These are flows that can be expected in the stream a relatively high percentage of the time. Each stream selected for regulation is rated by the departments of Ecology, Fish, and Game. A high rated stream, having greater environmental and scenic values, will require higher levels of flow protection. The Green-Duwamish River Basin Instream Resources Protection Program does not affect any existing water rights and uses.

PUBLIC PARTICIPATION

All interested individuals, private groups, and public agencies were encouraged to comment on any aspect of the recommended measures for the Green-Duwamish River Basin. Distribution of a draft basin report including proposed administrative rules and draft supplemental

environmental impact statement initiated public involvement for the Green-Duwamish River Basin portion of the program. Public comments were accepted at a public hearing held in King County at Auburn City Hall, on February 7, 1980 at 7:00 p.m. Written comments were accepted till the last day of February. Written comments and oral testimony taken at the public hearing are incorporated in the proposed rules and final basin report and FEIS. An informal workshop was held at Tacoma on March 10-12. Adoption of the rules was considered in an adoption proceeding held at Lacey City Hall, on April 22, 1980 at 10:00 a.m. The proceeding was continued 45 days to allow additional review prior to June 5, 1980, the date set for the formal adoption hearing.

II. BASIN DESCRIPTION

The Green River originates in the Cascade Range, in southeastern King County, and flows westward to Auburn, then northerly through the lower valley to Tukwila. There, at the confluence with the Black River the Green River becomes the Duwamish River which continues northward to Elliott Bay where it empties into Puget Sound. The river is 65 miles long between its mouth and the Howard A. Hanson Dam near Palmer. The area drained by the basin is 483 square miles and has a diverse topography. From its mountainous headwaters the river flows to an alluvial valley in mid-basin, and continues through a lowland valley to the mouth of the Duwamish. Annual precipitation in the basin varies with elevation, from 30 to 50 inches in the lowland areas receiving 30 to 50 inches per year as compared to more than 140 inches in the Cascade Range. Land uses that affect the basin's water resources are logging, manufacturing, commercial, agricultural and residential.

BASIN HYDROLOGY

Prior to 1906, the Duwamish River received the waters of the Green, White, and Black rivers. In that year, flow in the White River was permanently diverted into the Puyallup River basin to the south. In 1916, the level of Lake Washington was lowered 9 feet by construction of the Lake Washington Ship Canal. This caused the Black River (which included the runoff from the Cedar River, the Sammamish River and other Lake Washington drainages) to no longer serve as the outlet for Lake Washington. The drainage basin of the Green-Duwamish River was reduced to about one-fourth its previous size.

Floods in the basin occur generally as a result of warm rainstorms during the period from October to March. The floodwaters are primarily rain runoff, though they are often augmented by water from melting snow. The possibility of future flooding in the Green-Duwamish valleys was greatly reduced by the completion of Howard A. Hanson Dam in 1962. The dam provides enough storage to keep the Green River within its banks, but it does not totally eliminate all inundation of the river's flood plain. Local flooding still occurs because tributary streams cannot drain freely into the leveed banks of the Green River. In some areas, these waters are pumped over the levees and into the river, however, the river cannot accept this additional water when it is at its bankfull stage.

Minimum streamflows occur between July and November due to dry weather conditions normally experienced during the summer and fall months. Low flow characteristics of different streams are highly variable.2/ Where streams pass over areas of bedrock, flows will rapidly decrease after a cessation of rainfall. In areas underlain by more permeable materials, such as unconsolidated sand and gravel, streamflow is maintained by ground water contributions. Almost all streams in the Green-Duwamish River Basin are perennial, due in part to ground water contributions continuing through periods of dry weather.

The unconsolidated glacial-drift deposits underlying much of the Green-Duwamish River Basin contain ground water. Glacial till is the most extensive of the unconsolidated deposits. Little ground water is available directly from the till, but some dug wells tap lenses of gravel or sand that occur sporadically within the till. Most small domestic water supplies are obtained from water that seeps through the soil zone and collects in small amounts on top of the till.

Springs occur along the valley walls in the Green-Duwamish River Basin. Most of the large springs are the result of percolation of ground water through Vashon outwash deposits. The water moves laterally atop layers of silt and clay of lesser permeability and emerges along the valley walls. Springs are used for domestic water supply, and some of the larger ones are adequate for additional municipal supply. Land use changes severely interrupt the recharge of ground waters by routing surface runoff over impermeable surfaces. Urban runoff causes severe local flooding conditions in the Green River, while bypassing the natural hydrologic cycle including ground water recharge.

The average annual runoff to the Green River measured at the Spokane Street Bridge (R.M. 0-3) is 965,800 acre-feet. The average annual flow recorded at Auburn is 1,360 cfs. The flow of the Green River has been controlled by Howard A. Hanson Dam since 1962 and also has been depleted by the City of Tacoma's withdrawal of 112 cfs for municipal water supply. Prior to March 1, 1948, the City of Tacoma's average diversion was about 85 cfs. Minimum flow recorded at Auburn was 81 cfs on September 23, 1952.

INSTREAM RESOURCES

The Western Washington Instream Resources Protection Program is authorized under chapter 90.54 RCW (Water Resources Act of 1971) and chapter 90.22 RCW (Minimum Water Flows and Levels). The Water Resources Act of 1971 states ". . . perennial rivers and streams of the state shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values." (RCW 90.54.020(3)(a) emphasis added). Water quality of streams must be maintained (RCW 90.54.020(3)(b)). The protection of fish, game, birds or other wildlife resources, or recreational or aesthetic values is the stated purpose of the Minimum Water Flows or Levels Act (RCW 90-.22.010).

To protect the instream resources of the Green-Duwamish River Basin, the Department of Ecology and other state resource management agencies have been involved in studies to determine the value of the instream resources found there and the measures necessary for the protection of these resources. Of Western Washington streams studied to date, the Green River

has received the highest rating for its combined instream resources values. The flow levels selected for the Green River basin will reflect these significant values.

Wildlife Values

Wildlife habitat was once abundant throughout the Green-Duwamish River Basin. In the upland areas, limited or prohibited human access provides sanctuary to a variety of big game, furbearers, small game, and other nongame wildlife. In the lower reaches of the Green River, urban land use development has nearly obliterated wildlife habitat. Some wetlands remain in the floodplain and are used by large numbers of waterfowl. Several wetland areas in the lower Green River basin have been considered by the U.S. Fish & Wildlife Service under the Unique and Nationally Significant Wildlife Ecosystems Program. In the Green-Duwamish River Basin, several hundred species of birds, mammals, amphibian, and reptiles can be found, many of which inhabit wetlands.3/

Fisheries

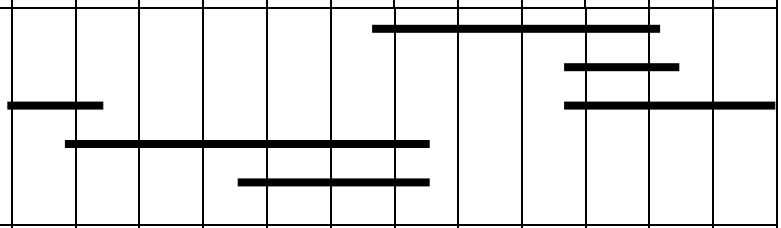
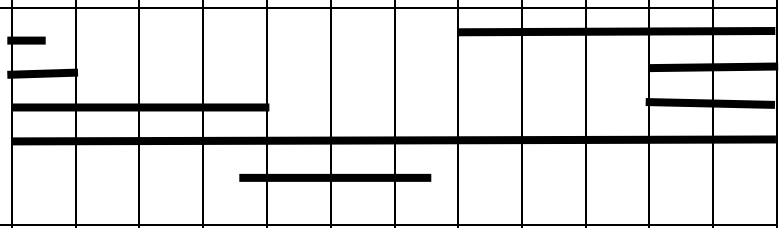
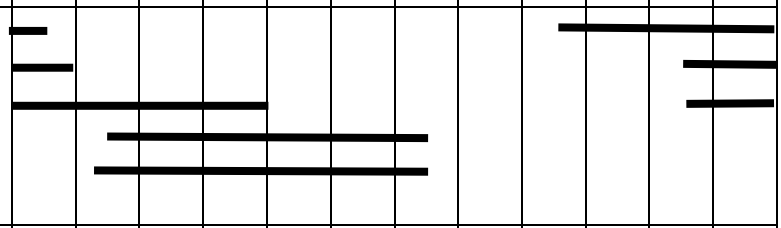
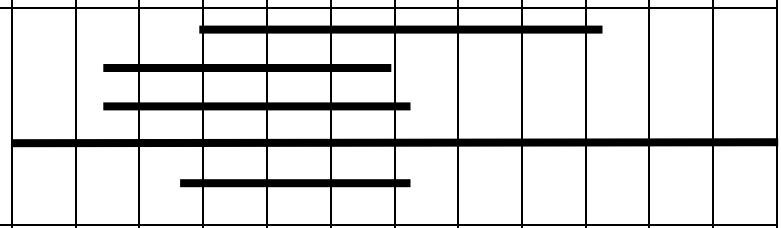
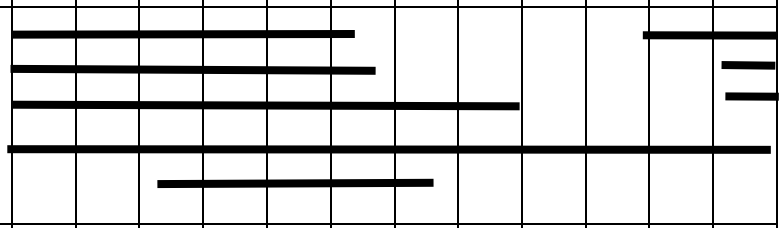
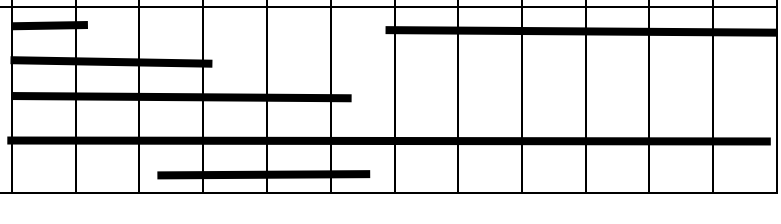
Anadromous salmonids found in the Green River are chinook, coho, and chum salmon and steelhead trout. Pink salmon were once abundant but have not been reported in recent years. Chum runs have declined, but a viable native population remains and is now being augmented by an enhancement program by the Muckleshoot Tribe. Other fish include searun cutthroat, rainbow, and Dolly Varden trout. In addition, several predator fish species are found in the Green River.

Chinook spawners, steelhead, and searun cutthroat trout primarily utilize the Green River from Tacoma's diversion structure near Kanaskat, downstream to the vicinity of Kent, and Newaukum and Big Soos Creek. Prior to construction of Tacoma's diversion dam, salmon and steelhead were found upstream of the area in which the dam is now located. Tacoma's diversion dam stopped this migration. Juveniles rear in the entire accessible length of the Green River.

Coho spawning occurs in all accessible areas of the Green River. Tributaries maintaining coho runs include Newaukum, Crisp, Burns, and Big Soos creeks, all upstream from Auburn, and Spring Brook and Hill creeks, near Kent. Coho juveniles rear within most areas of the watershed throughout the year.

Chum salmon once spawned in all accessible areas of the Green River. Chum salmon adults preferred the split channel and slower velocity sectors from a point near Newaukum Creek downstream to the vicinity of Kent. Chums also spawned in the same tributaries utilized by coho. The lower Duwamish, and marine environment of Elliott Bay were initial acclimating areas to salt water, through which juveniles moved to sea soon after hatching.

TABLE 1. Timing,of salmon and searun trout fresh water life phases in Green-Duwamish River Basin 4/

Species	Fresh-water Life Phase	Month											
		J	F	M	A	M	J	J	A	S	O	N	D
Summer-Fall chinook	Upstream migration Spawning Intragravel develop. Juvenile rearing Juv. out migration												
Coho	Upstream migration Spawning Intragravel develop. Juvenile rearing Juv. out migration												
Chum	Upstream migration Spawning Intragravel develop. Juvenile rearing Juv. out migration												
Summer steelhead	Upstream migration Spawning Intragravel develop. Juvenile rearing* Juv. out migration												
Winter steelhead	Upstream migration Spawning Intragravel develop. Juvenile rearing* Juv. out migration												
Searun cutthroat	Upstream migration Spawning Intragravel develop. Juvenile rearing* Juv. out migration												

*Normally extends over a two-year period.

Intergravel egg development occurs over an 11-month period because of the overlapping spawning period of various species. High flows during the period of March through June mark the peak of out-migration for all species; although coho, chinook, and trout naturally redistribute within the stream system throughout the year. Downstream migrants spend considerable time in freshwater and the estuarine environment. The lower six to eight miles of the Duwamish River serve as the transition zone where the fry acclimate to salt water, and as a rearing area for juvenile salmonids.

Upstream migration of a variety of species occurs throughout the year. Of particular interest to the Green-Duwamish River Basin Instream Resources Protection Program are the summer-fall runs of chinook, coho, chum, steelhead, and sea-run cutthroat. Adverse conditions affecting the migration of fish are poor water quality in the lower river including temperature, physical barriers, the destruction of spawning habitat and detrimentally low streamflows.

During the normal low flow period, severe water quality problems can impede or block transport of anadromous fish. High water temperature and reduced oxygen occurs in the lower Green River, particularly during the low flow period. The City of Tacoma diversion structure near Kanaskat is a physical barrier to upstream migration. There is currently no use of Howard A. Hanson Reservoir or streams upstream from the dam for anadromous fish propagation. Available habitat has been progressively lost in the lower reaches of the Green-Duwamish River Basin due to continued suburban development. The small fish-producing tributaries particularly significant for coho and steelhead have been altered by channel changes, destruction of pool-riffle areas, removal of streambank cover, siltation of substrate, and deterioration of water quality. These are chronic problems for small streams subject to urban development throughout Western Washington.

The state maintains and operates the Green River Salmon Hatchery on Big Soos Creek, near Auburn. Fall chinook and coho salmon and some chum are propagated at the Green River facility. The State Department of Fisheries "Program for Expanding Salmon Rearing Pond Facilities" describes a proposed rearing pond facility, Icy Creek No. 2 to be located in the Green River Gorge area. The project would produce an estimated 400,000 spring chinook smolts annually, contributing about 15,400 spring chinook per annum to sport and commercial fisheries. The Muckleshoot Indian Tribe, which utilizes the Green and Duwamish rivers as its principal tribal fishery, has begun development of a hatchery program. The Department of Game operates a hatchery at Palmer.

Fishing patterns and distribution of the catch has been altered by adjudication of the Indian fishery rights. Prior studies had shown that 111,450 sport angler days produced 22,550 steelhead from the Green River drainage. 5/ Elliott Bay, which supports over 60,000 angler days annually, is a favorite salmon sport fishing area associated with the Green River runs. Existing fisheries information indicates that an estimated maximum 27,000 wild and hatchery chinook spawners have escaped annually to the Green River system. Coho escapements average about 43,500 annually, most of which return to the Green River hatchery. The steelhead fishery on the Green River averaged 11,523 fish for the years 1961-1977. Indian fishing by the Muckleshoot Tribe, annually catches about 12,000 coho in the river and 18,000 in the bay.6/ Chinook catches have been about 1,500 in the river and 2,000 in the bay. The steelhead catch has been about 2,500

caught in the bay and as many as 4,000 in the river. The Muckleshoot's enhancement program is expected to provide about 15,000 harvestable chum salmon in the lower river.

The control of Green River flows through the operation of Howard A. Hanson Dam and the City of Tacoma's diversion dam significantly affect fish populations. Flow releases downstream from these facilities, although augmented by releases from Howard A. Hanson Dam, are often insufficient to alleviate poor water quality condition existing in the lower Duwamish, impeding adult salmonid transportation. 7/

The State Departments of Fisheries and Game have requested higher releases from the Howard A. Hanson Dam at numerous times in the past decade. The Department of Game cites the annual drying of steelhead redds below the dam, and bases their requirements on information from Collings, et al., 1972 and Swift , 1979 8/ Game is very interested in recovering this lost production. Fisheries has revised the spawning depth and velocity criteria, resulting in higher preferred spawning flows. These requests form the basis of Fisheries and Game input to the Green-Duwamish River Basin Instream Resources Protection Program.

Recreational Resources

The Green-Duwamish River Basin provides extensive recreational opportunities for the population of the central Puget Sound Basin. Additional planned development of these recreational resources will mean even greater enjoyment of the river environment. King County, local municipalities, and state and federal agencies are involved in making necessary improveents to the parks system in the basin. Existing facilities include the Interurban Trail, numerous municipal parks, golf courses, and picnicking facilities in the lower valley area. Above Tukwila, considerable water contact recreation occurs, with river rafting a popular past time. Further downstream, the recreational use of the river becomes decidedly “peripheral,” with fishing being of greatest value. From Tukwila to the Duwamish Waterway, the opportunity for continuous streamside enjoyment is considerably lessened by intensive urban-industrial development along the river.

The upper valley below Howard Hanson Dam is a regional recreational resource of considerable value. There are five park locations in this stretch of the river, which permit direct access to the river. Activities such as fishing, floating, canoeing, kayaking, and exploring can be carried out without any further development of recreational facilities.

The Green River Gorge is roughly 12 miles long, up to 300 feet deep, and from 500-1000 feet wide. The gorge is a complex geographic area of pools, riffles, waterfalls and springs. In 1968, the State Parks and Recreation Commission proposed a conservation plan for the Green River Gorge. A “Green River Gorge State - Conservation Area” was established and the acquisition of key parts of the gorge proceeded.

The recreational value of the gorge is primarily a "wilderness" type, with the greatest use being for walking, kayaking, swimming, camping, and picnicking. The steep gradient of this reach (46 feet/mile) makes it a difficult Class III reach for whitewater boating, depending on river flow. Other areas above and below the Green River Gorge attract numerous beginner and intermediate whitewater boaters. 9/

The Upper Basin above the dam area is predominately closed to the public because it is the watershed for the City of Tacoma. Some streamside area is usable below the City of Tacoma diversion, but is largely undeveloped. Public lands in the upper watershed area could eventually be opened to the public by the U.S. Forest Service, depending on the outcome of a watershed management plan currently being developed.

Water Quality

The Green-Duwamish River has three different classes of waters, as adopted in the State Water Quality Standards, chapter 173-201-080 WAC. The Duwamish River, from the industrial waterways to the confluence of the Black River (River Mile 11.0) is Class B. The Duwamish upstream of the confluence with the Black River to the limit of the tidal influence is Class A. The remainder of the Green River is classified as Class A, with the upper valley to headwaters classified as Class AA with the special condition that there will be no discharge of wastes permitted.

The Green-Duwamish River shows water quality problems that are associated with both natural and man-made conditions. 10/ Flow levels may be insufficient during the low flow period to allow transportation of water pollutants out of the river. Salt water naturally intrudes into the Duwamish when flows are less than 1000 cfs. At 650 cfs the saltwater wedge progresses upstream to about river mile 7.0. The maximum extent of tidal influence at mean annual low tide goes higher than RM 12.3. As the tidal wedge moves upstream, nutrients, phytoplankton, and biological oxygen demand (BOD) increase, while dissolved oxygen (DO) decreases.

The Duwamish segment of the Green-Duwamish River is subject to waterborne pollutants from a number of sources. In that segment the Renton Sewage Treatment Plant (STP) outfall contributes a significant portion of the flow of the river below that facility during late summer. Normal STP dilution standards (20:1) are not met during the late summer due to high volumes of outfall and relatively low instream flow. Average dilution may drop to lower than 4.1 at the outfall.11/ Conditions on the existing Renton STP permit allows a maximum dry weather flow of 38 million gallons per day (mgd) or 58.9 cubic feet per second (cfs). Wet weather flows are currently limited to 50 mgd or 77.5 cfs. The maximum core capacity of the Renton plant is 144 mgd. The sizing of the next increment of plant expansion is dependent on the current facilities planning study being done by the Municipality of Metropolitan Seattle (METRO).

Dissolved oxygen (DO) values are especially important for instream resources protection. Extremely low levels of DO concentration (2 milligrams/ liter) have been observed in the lower waterway. 12/ Upper waterway values of 4 mg/l have been observed. The conditions may cause severe damage to fisheries and can create a water quality blockage inhibiting the migration of anadromous fish. There also may be problems with chlorine toxicity, un-ionized ammonia, nitrates, metals and toxic substances associated with the STP.

The upstream segment of the lower Green River from Renton Junction to Palmer is classified as water quality limited due to nonpoint sources, which means that there are occasional violations of coliform, temperature, and dissolved oxygen standards. Temperature violations occur on an average of once in every two years at Auburn and Tukwila during the summer months. Low streamflows combined with lack of shade appear to be the cause of the temperature violations. Total coliform counts usually exceed Class B standards and probably result from storm drainage outfalls and nonpoint agricultural sources throughout the lower valley. Violations of Class A standards for dissolved oxygen, temperature, and nitrate concentrations have been recorded at Tukwila.

The 7 day/10 year recurrence low flow at Auburn is 107 cfs (discharge adjusted to base flow April 1, 1946 - March 31, 1964). 13/ The proposed instream flows (minimum 300 cfs) remain considerably above this particular water quality criterion throughout the year.

WATER RESOURCES DEVELOPMENT PLANS

The Western Washington Instream Resources Protection Program is a state resource management effort that will set conditions limiting any future water withdrawals. Surface waters of all tributaries of the Green River have been closed to future consumptive appropriations since 1953 in accordance with recommendations of the state departments of Fisheries and Game. In practice, some small water rights have been issued with the concurrence of Fish and Game. Future consumptive rights may only be granted for applications on the main stem of the Green River. Any future consumptive rights will be constrained by the Green-Duwamish Resource Protection Program and will be dependent upon the flow release schedule of Howard A. Hanson Dam.

The history of water resources development in the basin began early in the century with the City of Tacoma's diversion of municipal water supply. The diversion reached its current magnitude in 1948. Review is currently progressing on Tacoma's 1933 water appropriation application proposing the diversion of 100 cfs in addition to the current withdrawal of 112 cfs.

Howard A. Hanson Dam

The project was originally authorized as the Eagle Gorge Dam and Reservoir in the Flood Control Act of May 1950 and constructed between February, 1959 and April, 1962. The project, an earth filled dam at R.M. 64 was authorized to provide for flood control, conservation, municipal water supply, and irrigation. Pollution abatement, and industrial expansion were secondary benefits. Flood control and low flow augmentation were given as purposes in the authorizing document for which a definite present need exists. 14/ Secondary uses such as future utilization of storage capacity for further low flow augmentation and additional municipal water supply were recognized. Feasibility of accommodating the expanding needs for stored waters behind Howard A. Hanson Dam would have to be thoroughly analyzed by the Corps of Engineers. The City of Tacoma has requested study of additional municipal water supply from the dam. The Department of Ecology, in developing the instream flows program, has investigated operational changes of Howard A. Hanson Dam that the Corps of Engineers could make towards the objective of preserving instream resources.

The Howard A. Hanson reservoir capacity is 106,000 acre-feet. Maximum discharge through the spillway is 107,000 cfs. Normal discharges are through an outlet tunnel with a stilling basin. These releases normally are as high as 10,000 cfs when the reservoir is being emptied after a storm. Low flow period releases are through a 48" bypass pipe, and are normally at least 225 cfs. Fee purchase by the U.S. Government was made of 626 acres of reservoir lands lying between 1,035 feet (low point of dam) to 1,141 feet (full conservation pool level). Flowage easements were taken to permanently inundate all reservoir lands below a certain elevation, generally 1,141 feet. Flowage easements to occasionally overflow between 1,141 feet and 1,206 feet (maximum pool level) for temporary flood storage were taken out.

To achieve the project purpose of flood control, the reservoir is kept as low as possible to allow the storage and control of very large flood flows. The flood season generally extends from November 1 to March 1.

From April 1 to about June 1 each year, water is stored in the reservoir for conservation purposes to an elevation of 1,141 feet to provide 25,649 acre-feet of storage. Release of the stored water through the summer results in a minimum flow of 110 cfs in the river channel below the City of Tacoma's diversion dam (3 miles below Howard A. Hanson Dam, near Palmer, Washington). During this period, a minimum of 225 cfs or 110 plus inflow which ever is least, is passed by the dam during low flows, to provide the minimum flow and the needs of the Tacoma water supply r system. 110 efs is provided by storage and the rest by natural inflow. These releases are generally made until about November 1, when the reservoir is drafted down to provide flood storage.

Since the City of Tacoma can take 112 cfs for municipal water supply, the possibility arises that the low flow provision might be threatened. Under current operations, Tacoma diversion is unregulated and customarily takes the full 112 cfs. When inflow into the reservoir is unable to supply the additional 110 cfs stipulated as a minimum flow for fisheries management purposes, the instream resources below Tacoma's diversion receive less than the full minimum flow authorized by Congress. Violations of the low flow requirements have occurred, but the Corps of Engineers believes they are due to differences in gage ratings, special operations, or changes in pool levels.

Table 2. List of Minimum Discharges from Howard A. Hanson Dam*

Date	Flow
November 3, 1965	184 cfs
September 29, 30, 1967	208 cfs
October 9, 10, 11, 1967	204 cfs
September 10, 11, 12, 13, 1969	139 cfs
August 5, 6, 29, 30, 31, Sept. 1, 1970	188 cfs
October 2, 3, 4, 5, 1970	220 cfs
October 13, 1971	215 cfs
June 8, 9, 1973	202 cfs
September 29, 1974	210 cfs
November 1, 2, 3, 4, 5, 6, 1974	124 cfs

*Flow near Palmer corresponding to the above dates would normally approximate the figures above less the 112 cfs diverted by Tacoma.

Flows that drop below the minimum flow level during the fall, particularly October and November are damaging to migratory fisheries. Evacuation of the reservoir, which sometimes occurs in early October, can dramatically raise flows for a short period, often to be followed by continued dry conditions.

This can cause spawning salmon to deposit eggs too high on the periphery of the stream bed, where they will later be stranded as stream flows fall again. Early fall operation of the Howard A. Hanson Dam should be carefully managed. Ecology requests that the minimum flow regime be maintained as late as November 1, or later if there is a very dry fall.

Turbidity may be incidentally increased from the dam during periods of reservoir maintenance.

City of Tacoma Diversion

The City of Tacoma has utilized the upper Green River for its water supply since the early 1900s. The diversion dam is located 3 miles downstream from Howard A. Hanson Dam. Tacoma currently withdraws a continuous 112 cfs (72 mgd) from the Green River. A recent addition to the Tacoma system is a 72 mgd well field on the North Fork Valley above Howard A. Hanson, which is used to replace their main supply during periods of high river turbidity. This is needed an average of about 65 days a year. When well water is being used, an equal amount of river water is spilled back into the river at Palmer. Water supplies are sent through a 26-mile, 112 cfs capacity transmission main to the city's McMillan Storage Reservoir. This reservoir supplies about 75 percent of the city's water needs, the remaining 25 percent coming from a series of wells in the Tacoma area that are presently used to meet summer peak needs, emergencies, and during turbid river conditions.

Turbidity sometimes exceeds acceptable drinking water levels during periods of high winter and spring streamflows. In the past, during periods of high turbidity, the river water had been bypassed and spilled at the McMillan facility into the Puyallup River, and the city customers

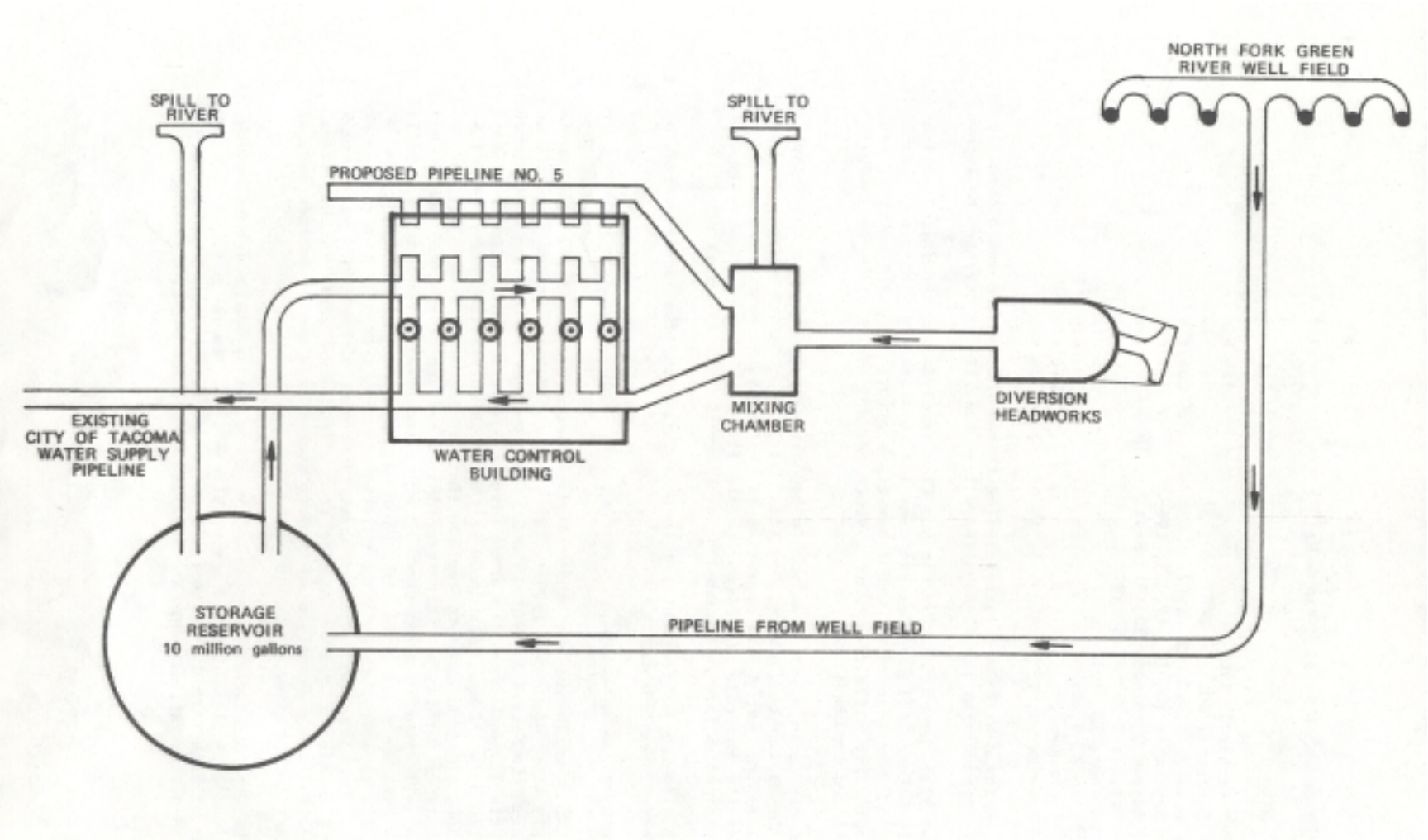


FIGURE 2. City of Tacoma Green River Supply

relied upon in-city sources. Some customers, however, were supplied directly from the gravity line between the headworks and McMillan Reservoir. This led to the planning of the North Fork well system, which enables the city to blend ground water with river water during these high turbidity periods resulting in acceptable levels of turbidity in compliance with drinking water standards. That system was selected over possible treatment (filtration) of the turbid waters due to lower construction and operating costs. The six production wells were anticipated to produce 72 mgd for 20 to 30 days, or up to 65 days a year at less than peak production.

Ground water from the North Fork well field is brought to the control center by a 6.5 mile gravity pipeline. There it enters a 10 million gallon storage reservoir located to provide enough water pressure to allow direct injection into the existing Tacoma water supply pipeline. Turbid river water is forced out of the pipe by the well water injection and is spilled back into the Green River at the control center. Figure 2 shows schematically the Tacoma Water Supply System.

Lower Duwamish River Navigation Study

At the request of the Port of Seattle, the Corps of Engineers is conducting a navigation study of the lower Duwamish River. The study is investigating means of widening and deepening the river channel. Channel modification could affect water quality in this stretch of the river.

RELATED PLANS AND PROJECTS

The quality and quantity of waters in the Green-Duwamish River Basin is related to the controls that are placed upon urban development and other disruptions of the hydrological system. Interruption of the natural replenishment of lowland streams and ground water by accelerating surface runoff over impervious surfaces is a serious water resources problem endemic to urban environments. To some degree, the instream flow protection program will be diminished in effectiveness if small tributary streams are not allowed to remain in as natural a hydrologic condition as possible.

Lower Green River flooding related planning is currently being carried out by King County, local jurisdictions and the Soil Conservation Service. Major capital improvements have been constructed to alleviate lateral drainage problems in the lower valley. These programs are being reassessed by the participants due to the lack of coordinated local drainage planning and decision-making arrangement.

Urban and industrial expansion has altered the lower Green River Valley. The removal of riparian vegetation, straightening of channels, and water pollution from industry, septic tanks, and nonpoint pollution sources has caused water quality and habitat problems for fish production.

Corrective actions have been initiated at the state and local governmental levels. Community plans for major sections of the Green River Basin incorporate environmental quality policies in their recommendations for future development. Technical planning studies that will implement the King County drainage policy are currently underway in some parts of the county. A coordinated, basinwide surface water management program for the Green River, joining together the five municipalities and King County, was begun in March 1978. A program dedicated to

improving stream habitat for salmon species is being directed by the Metropolitan Municipal Corporation of King County (METRO), the areawide water quality planning and management agency for the Cedar-Green basins. It will tie into state efforts in urban stream rehabilitation.

Lower Green River Watershed Project (Soil Conservation Service)

Major flooding has been a serious problem in the Lower Green Valley. Flood damage at Auburn occurs at a discharge of greater than 9,000 cfs. The 1959 flood had an estimated peak discharge of 34,000 cfs. The channel capacity of the Lower Green is considered to be 12,000 cfs. Since the completion of Howard A. Hanson Dam in 1962, overbank flow has been largely eliminated except in a few areas downstream of Black River.

The flooding that now occurs is due to the inability of surface waters in the lower valley to drain laterally into the main stream channel. Under 100-year base flood conditions, when the Green River channel is filled for seven to eight days, over 8,400 acres of land are covered by the flood waters, due to exterior surface water conditions. Average annual flood damages in the Green River Valley are currently estimated by the Soil Conservation Service (SCS) to exceed $1 million. 15/

In the early 1960s, local governments asked the Soil Conservation Service to solve the back-levee flooding problem. A system of drainage channels was proposed to convey the flood waters to the Green River, where it would enter the river by gravity under normal conditions and be pumped during high flow periods. The east and west side Green River watershed projects were authorized to begin construction in 1968. Actual construction was completed for two pump stations. Further progress on the watershed projects has been curtailed pending the completion of an environmental impact statement (SCS, November 1978) and the development of a local financing plan for the system.

Implementation of the watershed projects is prohibited by the existing channel size of the lower Green River. When waters are being released from Howard A. Hanson Dam following a storm, the channel is essentially full in the Green River Valley. Pumping additional water into the river only results in flooding over the banks. The Green River channel is bankful at 12,000 cfs. The Corps of Engineers determined that the most feasible way to increase the capacity was to raise the streamside levees. The levee improvement project was terminated in 1971 due to lack of local action on the project. King County requested reactivation of the project in 1976. The county has recently published A River of Green, a study detailing recreational and environmental opportunities that could be combined with levee improvements. 16/

Feasibility of the levee improvement project will be determined in a Corps of Engineers investigation to be initiated soon. An alternative to raising the levee would be to increase the fall-winter flood storage behind Howard A. Hanson Dam and release stored water at a slower rate during and following storms. Such proposed operation may involve reauthorization, lengthy study, and construction at the reservoir.

Community Planning Policies (King County)

Community plans that have recently been completed for the Green-Duwamish Basin include the Federal Way (adopted 1975), Sea-Tac Airport (adopted 1976), and Soos Creek (to be considered for adoption October 1979). Each of these plans has stressed the need for adequate drainage controls for urban runoff. Urban development with inadequate controls and mitigation is observed to decrease the duration of flow and increase the peak volumes of urban runoff. This causes severe erosion and sedimentation of natural channels, degrades water quality with various pollutants, and intercepts natural percolation to underlying aquifers.

The King County Drainage Ordinance, adopted by the county in 1976, has been proposed for adoption by other jurisdictions in the METRO 208 Water Quality Management Study. Drainage improvements, approved as part of a drainage plan required for substantial developments, would be designed so that the peak discharge from a property is not increased due to the proposed development. Retention/detention ponds are to be supplied to handle all surface waters in excess of the peak discharge.

Stream habitats in the Soos Creek drainage area are considered prime natural features to be protected from adverse land use impacts. Soos Creek is believed to be the most important producer of coho salmon in the Green-Duwamish Basin. 17/ Community planning policies which positively affect the stable condition of streams in the area include flood control, aquifer recharge, wetlands protection, wildlife habitat, and a proposed steep slopes ordinance.

Green River Basin Program (King County and Local Jurisdictions)

Community planning policies and development controls do not set forth corrective actions for all surface water quantity and quality problems. Areawide problems often require multijurisdictional, highly technical solutions. Such is the situation facing King County and the Green River Valley municipalities. It has been recognized that surface waters flow across political boundaries and that the valley floor and tributary streams are severely impacted by upland developments. A basinwide program has been developed in the Green River to provide an integrated planning strategy to formulate surface water problem solutions of a multijurisdictional nature. 18/

Early implementation of this program includes adoption of uniform local regulations and policies and functional solutions that are compatible with one another. An interim program is designed to continue regional coordination and policy development until the long-term, basinwide surface water management program can be established. The surface water management program will provide a decision-making forum that will consider local actions, such as subbasin drainage improvement programs, federal projects, and state programs related to flows in the Green River. King County has proposed an intergovernmental Planning and Management Agreement for drainage and flood control in the Green River. State interest in maintaining flows in the Green River and tributaries could be served by participation in the proposed committee.

State and Local Stream Rehabilitation Programs (METRO)

The urban and small tributary streams of the Green River Basin are important habitat and scenic resources. Many of these streams have been affected by urban runoff, septic tank leakage, streambank erosion, sedimentation and the blockage of flow by obstructions. Local and state action is needed to rehabilitate these streams by cleaning up the stream course where necessary, and developing a public awareness program to prevent future deterioration of riparian habitats. These programs are part of areawide water quality management for the Green River Basin.

METRO, King County, and various sports fisheries groups are involved with public awareness programs. A proposal by the South King County Steelheaders group would upgrade the quality of the Green River near the point where it passes Kent. This same group has proposed a program to alleviate contaminated surface water runoff from the dairying operations in the Newaukum Creek area. The funding of a stream fencing demonstration project has been temporarily halted awaiting a broader State of Washington and King County Conservation District effort to accomplish agricultural pollution abatement through the Rural Clean Water Program. The value of the stream environment in the Green River for all instream uses will be protected only if the future quantity and quality of the waters is assured.

III. CURRENT ADMINISTRATIVE STATUS

Laws of the State of Washington authorize the department to manage the waters of the state, declaring beneficial uses and appropriating rights to the waters. Statutory powers allow the department to condition the usage of water through surface water source limitations, instream flows or levels, the regulation of ground water withdrawals and the storage of public waters.

SURFACE WATER SOURCE LIMITATIONS

The Department of Ecology is required to consider placing special low flow restrictions on water appropriations from specific streams when such restrictions are recommended by the departments of Fisheries or Game for the protection of fish resources (chapter 75.20 RCW). These restrictions require that water diversion cease when the flow of the stream falls below the designated low-flow level. Requests for appropriations may be denied, and streams closed to additional appropriations, when the departments of Fisheries or Game and Ecology have determined that insufficient quantities of water are available for further appropriations without detrimentally impacting fish resources. These low flow and closure actions are referred to as surface water source limitations.

Table 3 and Figure 3 display the surface water source limitations currently in effect in the Green-Duwamish River Basin. The existing surface water source limitations close the tributaries of the Green River and all other streams in the basin to further appropriations. The main stem of the Green River will remain open. These administrative actions are proposed for formal adoption through the Green-Duwamish Instream Resources Protection Program.

GREEN-DUWAMISH BASIN
WRIA 9

TABLE 3 - CURRENT ADMINISTRATIVE STATUS OF STREAMS AND LAKES, GREEN-DUWAMISH RIVER BASIN

Stream	Tributary	Action	Date(s)
Deep Creek	Deep Lake	Closed	4/17/53
All of the Green River tributaries	Duwamish River	Closed	1/19/45, 3/31/76
Unnamed Stream (Cold Brook Creek)	Poverty Bay	Low Flow	7/31/39, 6/10/75
Unnamed Stream (Des Moines Creek)	Puget Sound	Closed	8/22/52, 7/26/73
Unnamed Stream (Garrison Creek)	Black River	Closed	10/18/51
Unnamed Stream (Miller/Maybrook Creek)	Puget Sound	Closed	1/7/46
Unnamed Stream (Springbrook Creek)	Black River	Closed	4/1/46, 9/14/66
<u>Lake Levels Established</u>			
Angle Lake		Lake Level	5/21/75
Lake Sawyer	Covington Creek	Lake Level	8/5/72
Star Lake		Lake Level	9/27/50

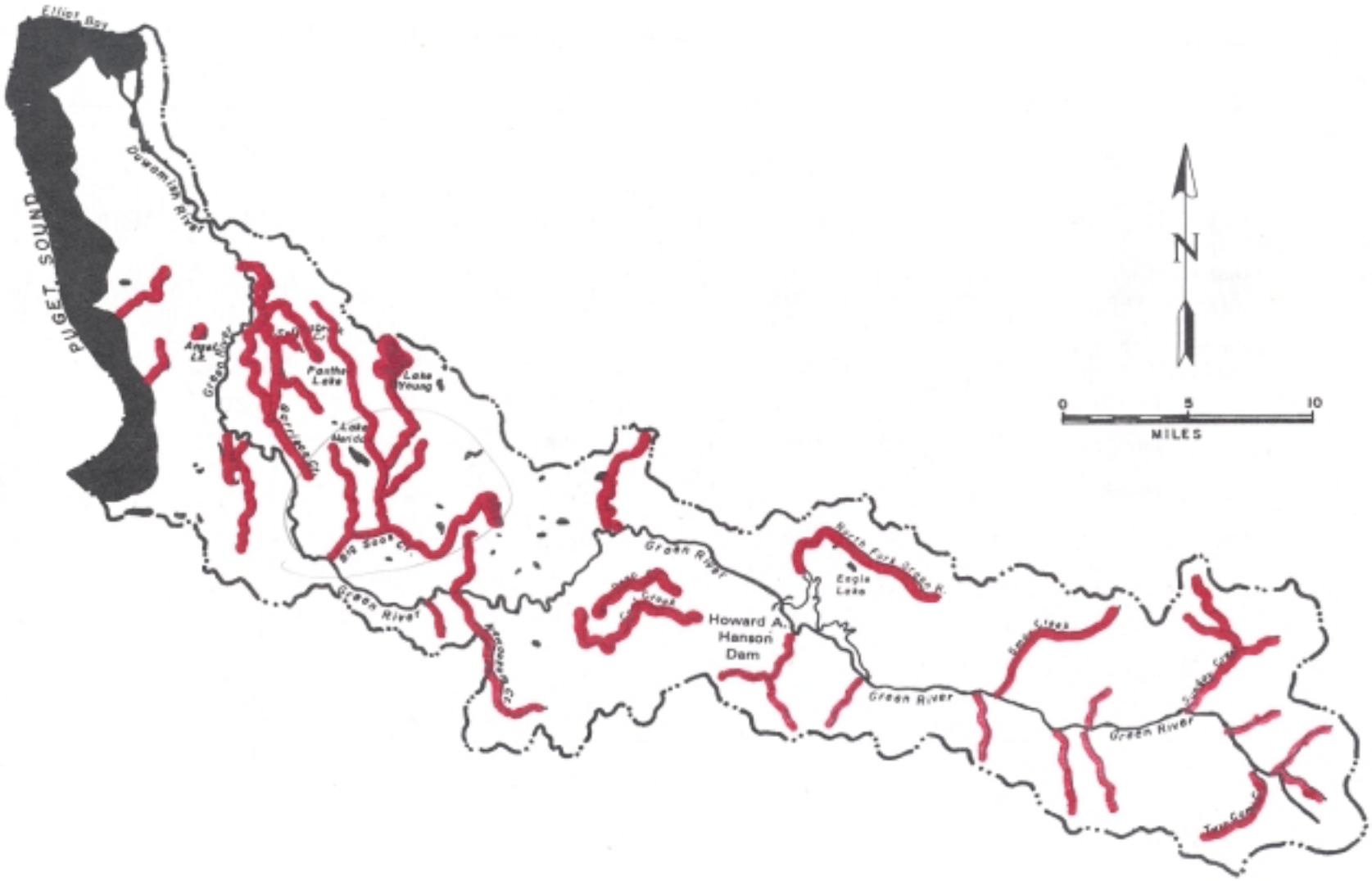


FIGURE 3. Current Administrative Status in the Green-Duwamish Water Resource Inventory Area (WRIA)

MINIMUM AND INSTREAM FLOWS OR LEVELS

Legislative action in 1969 and 1971 provided for the establishment of minimum and base flows. The Department of Ecology, when requested by Fisheries or Game, shall establish minimum flows or levels as required to protect instream values and any fish, game, or wildlife resources (chapter 90.22 RCW). In the Green-Duwamish River Basin, minimum flows have been requested on the Green River (letter from Game, 11-10-72). Minimum flows have not been established in the Green River as requested.

The Western Washington Instream Resources Protection Program is authorized under this chapter and by Chapter 90.54 RCW (Water Resources Act of 1971) and Chapter 173-500 WAC. The Water Resources Act states ". . . perennial rivers and streams of the state shall be retained with base flows . . . " (RCW 90.54.020). Flows or levels proposed in the Western Washington Instream Resources Protection Program will be adopted under both Chapter 90.22 RCW (minimum flow) and Chapter 90.54 (base flow) and will be known generically in this program as instream flows.

No existing water rights will be affected by adoption of the administrative rules that are proposed in this program. It is not the intention of this program to reopen the tributaries of the Green River or any other streams in the basin, currently under administrative closure, to future appropriation of surface waters. This program is designed to condition surface waters of the main-stem Green River brought into use in the future. Instream flow restrictions will be placed upon future consumptive rights granted under the provisions of the Green-Duwamish Instream Resources Protection Program.

REGULATION OF GROUND WATERS

The natural interrelationship between ground and surface water must be assessed in any future ground water permitting actions. This will assure that withdrawals of ground water will not cause stream flow levels to fall below limits proposed in this program. Ground waters remain open for future appropriation in all the Green-Duwamish River Basin. It is anticipated that ground water will be relied upon in many instances where surface water rights will not be available due to this program or because of water quality considerations.

STORAGE OF PUBLIC WATERS

Impoundment of surface waters in a reservoir project is an available means of appropriating additional water resources in the Green-Duwamish River Basin. The existing rights to water in the upper Green River Basin are supported by the flow release schedule of the Howard A. Hanson Dam. Though the dam is a federal project, and is exempt from state control, the use of stored waters is subject to the state's authority in issuing water rights.

A secondary application will be required for parties applying for beneficial use of the water stored in a reservoir. Such a secondary application must refer to the reservoir as its source of water supply and show documentary evidence that an agreement has been reached with the owners of the reservoir to impound enough water for the purposes of the application (RCW 90.03.370).

An additional increment of water supply from storage will require agreement with the Corps of Engineers, the owners of the reservoir, to store the additional water required and to release it during the low flow summer period. This is necessary because of the high surety required for municipal water supply and the uncertain availability of natural flows above that which is presently committed. Receipt of a state water right permit is also required.

APPROPRIATION OF WATER RIGHTS

The acquisition of water rights has been codified in the State of Washington since 1917. Prior to that time, rights were acquired through ownership of riparian lands or development of the water use. Since the establishment of the Water Code, rights are acquired after acceptable application, the issuance of a permit to develop, and perfection of the right through application of water to beneficial use. Water uses established prior to 1917 are recorded as registered water right claims and in the Green River basin, have not been adjudicated to determine validity and priority.

The City of Tacoma has a registered water right claim, stemming from public notice to develop water rights prior to 1917, for 400 cfs from the Green River. 112 cfs capacity has been established through development of their existing diversion and pipeline. In addition, Tacoma has developed the North Fork Green River well field under an appropriation permit, for up to 72 mgd withdrawal. Tacoma has recently requested DOE action on a 1933 priority date application for 100 cfs proposed to be diverted from the Green River, through pipeline No. 5. 19/

Other pending water right application are on file with DOE for waters from the Green River. Significant requests include the City of Tacoma (50 cfs - 1956 application date), King County Water District No. 75 (40 cfs - 1955 application date), and King County Water District No. 124 (50 cfs - 1957 application date). The requests will be held until a thorough review of water supply in the Green River has been completed.

IV. DETERMINATION OF INSTREAM FLOWS

The department has determined that a limited number of river segments, or control reaches, will be provided with instream flows or levels. The proposed instream flows for the Green River are identified at two control stations. These locations are displayed in Table 4 and Figure 4, Proposed Control Locations.

The proposed rules are prepared under a program that has analyzed the instream resources needs of the Green-Duwamish Basin. The program is based on a hydrological methodology developed by the Department of Ecology. Other state and non-state instream resources protection agencies or interests were asked to comment on the proposed flows or levels, using their own methods for

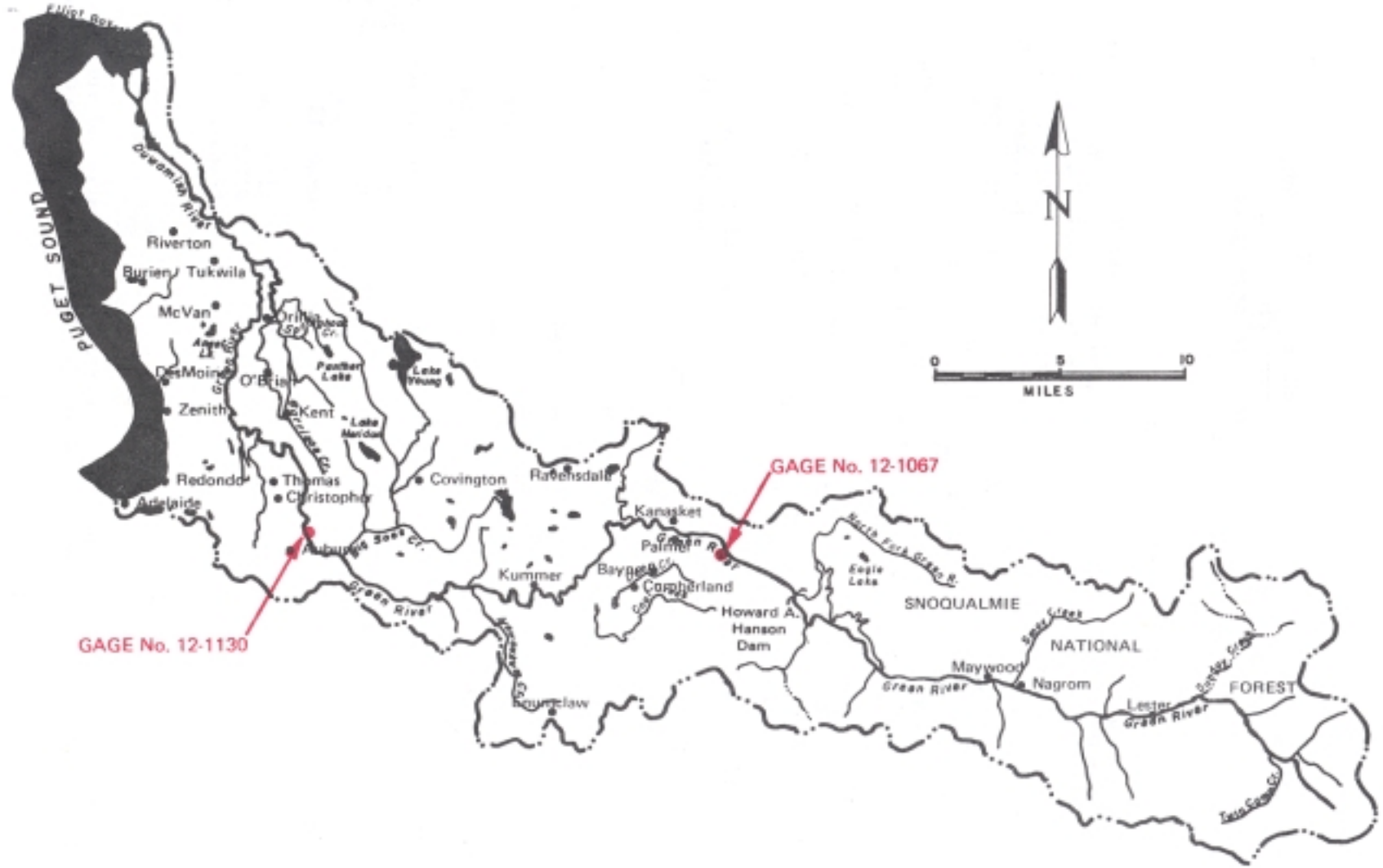


FIGURE 4. Proposed Control Locations in the Green-Duwamish Water Resource Inventory Area (WRIA)

determining adequate levels of protection for instream resources. Mutually agreed upon values were sought through consultation with the Washington departments of Fisheries and Game and other instream resources interests.

CONTROL STATIONS AND REACHES

The Department of Ecology concludes that two control stations will provide adequate managerial control over future diversions from the Green-Duwamish Basin. The number of stations is limited because most of the basin is presently administratively closed to future water rights. The presence of Howard A. Hanson Dam creates potential opportunities for additional future stored waters and future water rights developed on the main stem Green River using stored water. The release schedule for flows from this dam prescribes flows to be monitored at Palmer, 1.2 miles downstream from the City of Tacoma diversion, at the existing U.S. Geological Survey gage. The instream flows will be monitored at the Palmer gage.

Instream flows or levels will also be measured at Auburn, at the U.S. Geological Survey gage. Flows at the lower Green River reach are critical for low flow dilution of the Renton sewage treatment plant and flood stage flow releases from the Howard A. Hanson Dam.

Water diversions under water rights that are subject to flow restrictions will cease diverting when the flow falls to specified levels. Notification of pending action will be made as far in advance of the actual flow condition as is possible.

TABLE 4

PROPOSED CONTROL LOCATIONS (DOE)

Control Location	Gage Number	River Mile	Stream Management Reach
Green River (at Auburn, WA)	12.1130.00	32.0	(from influence of mean annual high tide at low instream flow levels to near USGS Gage #12.1067.000)
Green River	12.1067.00	60.4	(from USGS Gage #12.1067.000 to headwaters)

STREAM RATING

The stream rating process provides the required evaluation of instream resources. This was described in detail in the FEIS and Program Overview for the Western Washington Instream Resources Protection Program. Instream resources are only partially quantifiable; some aspects of environmental quality are subjective measurements. To differentiate among different stream systems, the rating system was devised to reach a consensus on the relative significance of various streams.

Inherent in the rating process is a comparative definition of levels of required instream resources protection. Where the values for instream resources are relatively high, the level of instream flow protection provided will be comparatively high. A conversion curve has been developed to convert stream ratings to instream flow occurrences.

A stream rating committee was formed of state agencies concerned with stream related activities. Each participant was asked to rate a particular stream or reach, from a low value of one to a high value of four. Each stream was rated for six categories:

Wildlife (Values for birds, wild animals, excluding fish)

Fish (Use values for propagation, rearing, and migration of fish, resident game fish and values of stream for fishing.

Scenic and Aesthetic (Audible and visual values of natural beauty).

Navigation (Values for all forms of boating)

Other Environmental Values (Miscellaneous activities such as recreation, swimming).

Water Quality Standards (Set by State of Washington Department of Ecology).

The composite stream ratings and percent flow duration figures for streams in the Green-Duwamish Basin are very high (22.7 out of a possible 24), reflecting the high value attributed to all six instream uses.

PERCENT FLOW DURATION

Percent flow duration refers to a specific percent-of-time that a flow level will be exceeded. A complete, year-long flow picture is constructed as a family of hydrographic curves with each individual curve displaying a specific percent-of-time exceedence frequency level. The percent flow duration figures for the Green-Duwamish River basin refer to exceedence curves selected for low flow or high flow periods.

The 95 percent-of-time flow duration hydrograph serves as a guide for instream flows during all high flow periods, while a variable percent duration, based on stream rating value, is used during low flow periods. For the Green-Duwamish River basin a summer low-flow period exceedence curve of 63 percent was selected. These curves are joined to produce the first-cut hydrologically based instream flow hydrograph.

INSTREAM FLOW HYDROGRAPH

The initial instream flow hydrograph is presented by DOE to the study team for their review and comment. Fisheries and Game personnel will submit their own recommendations, based on habitat requirements and time-of-ear instream resource uses. The determination of flows by th study team participants is guided by the analysis of flow proposals in terms of spawnable area criteria or actual instream resources utilization observation.

Since flows in the Green River are controlled by a major water resources development project, Howard A. Hanson Dam, a secondary set of flows have been provided to apply to dry-year conditions at the Palmer gage. These critical year flows are a level of security which cannot be violated, except under unusually harsh conditions. In most years, the project will be operated above the normal year flows shown in the hydrograph incorporated in WAC 173-509-030(3).

V. MANAGEMENT OF INSTREAM FLOWS

The flow figures found in the following administrative rules will be operative for the stream management units cited. In establishing instream flows, the Department of Ecology is identifying instream resources protection levels not currently available due to the existing operation of Howard A. Hanson Dam. In the interim, it is expected that some modification of operating procedures of Howard A. Hanson Dam can be accomplished to at least partially implement the Green-Duwamish Instream Resources Protection Program recommendations. The flows will be constraints on future water rights on the main stem Green. They are not expected to be immediately adopted by the Corps. With the exception of requirements to store water for conservation periods, the instream flows should be provided by the Corps from natural flows.

The schematic representation in Figure 5, Management of Instream Flows, portrays the functional relationships between instream flows, existing uses and the Corps authorization to provide for 110 cfs instream flow. No rights are established in the graphic presentation, Management of Instream Flows, or in WAC 173-509-030(c), where the relationships between future rights are described in the proposed administrative rules (Appendix A).

In formally adopting the instream flows as administrative rules to govern future water rights on the Green, the department will continue the existing administrative closure of tributaries of the Green River and other small streams in the basin. Formal adoption of the existing surface water closures is proposed. Therefore, future consumptive water rights available will be limited to the main-stem of the Green River. Issuance of a water right for an additional amount of municipal water from Howard A. Hanson reservoir will be governed by the permit conditions established in the proposed administrative rules. New applications will be accepted for surface water diversions from the main-stem Green River for direct use of surface water or for impounded waters from additional storage projects. All future water rights for consumptive uses will be conditioned by the instream flow restrictions outlined in the proposed administrative rules and will be granted only after thorough analysis of water availability.

The department will administer a two-stage instream flow curve for any additional consumptive water rights established using water from the Howard A. Hanson reservoir. The normal year curve will usually be in operation, but if natural Green River flows fall below the one in ten-year Green River flow frequency, the director may determine it necessary to allow flows below the normal year flows.

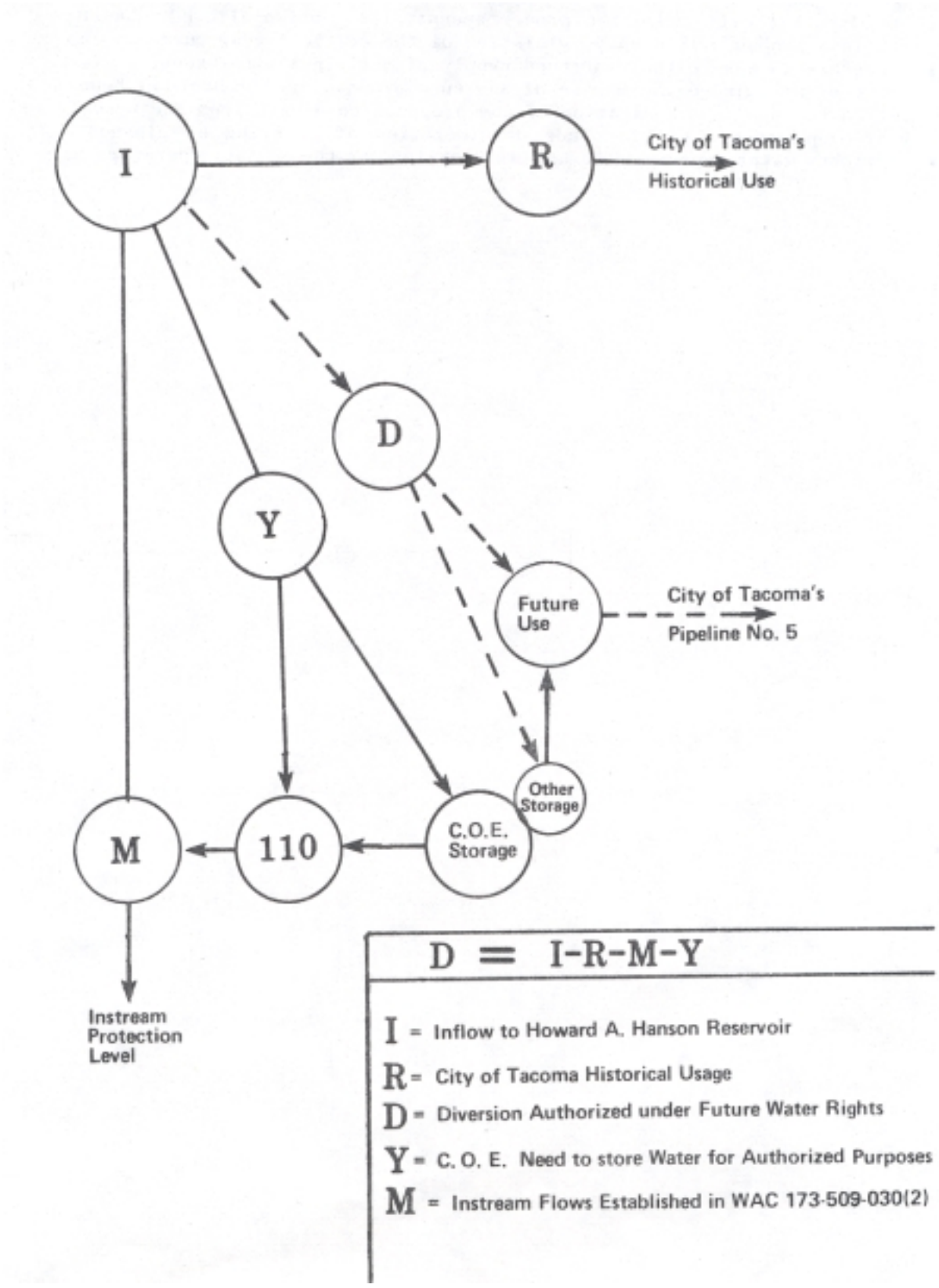


FIGURE 5. Management of Instream Flows

The director will judge the proper amount of exception allowed. Under far less probable frequency, violation of the critical year curve may be necessary to assure the continued supply of municipal water supply. The director will judge the merits of any such proposal on the basis of benefit to the public. Evaluation of any proposal to depart from the normal year requirements will include consideration of existing or planned emergency water conservation measures outlined by the project operator.

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GLOSSARY

Acre-foot: A unit for measuring the volume of water or sediment. It is equal to the amount of water needed to cover one acre of land with water one foot deep. This 43,560 cubic feet, or 325,861 gallons.

Anadromous Fish: Fish that spend a part of their lives in the sea but ascend rivers at more or less regular intervals to spawn. Examples: Salmon, some trout, shad, and stripped bass.

Appropriation: The administrative or physical process of obtaining water.

Base Flow: As defined in the Water Resources Act of 1971 (Ch. 90.54 RCW), base flows are the flows administratively established "necessary to provide for the preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values."

Closure: Administrative measure to keep water resources from further appropriation for consumptive uses. Generally, domestic household use and normal stock watering are exempted from closure when there is no practicable alternate source of supply.

Consumptive Use: The amount of water used in such a way that it is no longer directly available. Includes water discharged into the air during industrial uses, or given off by plants as they grow (transpiration), or water which is retained in the plant tissue, or any use of water which prevents it from being directly available.

Control Station: Any streamflow measurement site at which a regulatory base flow has been established.

Cubic Feet Per Second (cfs): A unit of measure for the rate of discharge of water. One cubic foot per second is the rate of flow of a stream where one square foot is flowing at one foot per second. It is equal to 448.8 gallons per minute.

Diversion: The physical act of removing water from a stream or other body of surface water.

Escapement: Adult fish that "escape" fishing gear to migrate upstream to spawning grounds.

Fry: Young fish from the time of hatching to approximately one inch in size.

Gaging Station: A particular location on a stream, canal, lake, or reservoir where systematic measurements are made on the quantity of water flow.

Ground Water: Water in the ground lying in a zone of saturation. Natural recharge includes water added by rainfall, flowing through pores or small openings in the soil into the water table.

Hydrograph: A graph showing varying streamflow (or stream discharge) with respect to time during a year as determined as specific cross-sectional location in the stream.

Instream Flow: Same as base flow. Minimum Flow: Same as base flow.

Nonconsumptive Use: Use of water in a manner which does not consume the resource. Fishery, aesthetic, and hydropower uses are examples of nonconsumptive use.

River Basin: The total area drained by a river and its tributaries; watershed; drainage basin.

Runoff: That part of precipitation which appears in surface streams. That is the streamflow before it is affected by artificial diversion, reservoirs, or other man-made changes in or on stream channels.

Storage Reservoir: A reservoir in which storage is held over from the annual high-water season to the following low-water season. Storage reservoirs which refill at the end of each annual high-water season are "annual storage" reservoirs.

Streamflow: The discharge or water flow that occurs in a natural channel. The word discharge can be applied to a canal, but streamflow describes only the discharge in a surface stream course. Streamflow applies to discharge whether or not it is affected by diversion or reservoirs.

Stream Management Unit: Stream segments, reaches, or tributaries, each containing a control station, which are identified as units for defining base flow levels.

Surface Runoff: That part of the precipitation which travels over the soil surface to the nearest stream channel.

Tributary: A stream that contributes its waters to a larger stream by discharging into it.

Turbidity: A discoloration of water due to the presence of suspended particles, organic matter, or other pollutants.

Water Rights: A legal right and property interest (subject to certain limitations) to obtain specific maximum quantities of water from specific sources for application to beneficial use.

APPENDIX A

Proposed
Chapter 173-509 WAC

INSTREAM RESOURCES PROTECTION PROGRAM GREEN-DUWAMISH RIVER BASIN, WATER RESOURCES INVENTORY AREA (WRIA) 9

FORM OF ORDER AND TRANSMITTAL BY AGENCY HAVING SINGLE HEAD

State of Washington

DEPARTMENT OF ECOLOGY

(agency name)

Administrative Order No. DE 79-32

(1) I, Elmer C. Vogel, deputy director of the Department of Ecology do promulgate and adopt at Lacey City Hall Council Chambers, Lacey, WA, (place) the annexed rules relating to:

Adopting chapter 173-509 WAC--Instream Resources Protection Program--Green-Duwamish River Basin, Water Resource Inventory Area (WRIA) 9.

(2) **ALTERNATIVE A. Use only for Adoption of Permanent Rules.**
This action is taken pursuant to Notice No. 79-12-110 & 80-05-076 **filed with the code reviser on** 12/5/79 & 4/30/80. **Such rules shall take effect:**

☒ pursuant to RCW 34.04.040(2).
☐ at a later date, such date being _____.

(2) **ALTERNATIVE B. Use only for Adoption of Emergency Rules.**
I, _____, find that an emergency exists and that the foregoing order is necessary for the preservation of the public health, safety, or general welfare and that observance of the requirements of notice and opportunity to present views on the proposed action would be contrary to public interest. A statement of the facts constituting such emergency is:

Such rules are therefore adopted as emergency rules to take effect upon filing with the code reviser.

(3) Pursuant to the requirements of RCW 34.04.___ (1977 c 19 § 2)[1] that "every agency shall incorporate the most specific, but in no case omit all, of the following language alternatives when adopting or amending rules" (fill in statement (a), (b), or (c) as appropriate):

☒ (a) This rule is promulgated pursuant to RCW 90.22.020, 90.54.020 and 90.54.040 and is intended to administratively implement that statute.

☐ (b) This rule is promulgated pursuant to RCW _____ which directs that the

_____ (agency)

has authority to implement the provisions of

_____ (name of act or RCW citation)

☐ (c) This rule is promulgated under the general rule-making authority of the

_____ (agency)

as authorized in RCW _____

(4) The undersigned hereby declares that he has complied with the provisions of the Open Public Meetings Act (chapter 42.30 RCW), the Administrative Procedure Act (chapter 34.04 RCW) or the Higher Education Administrative Procedure Act (chapter 28B.19 RCW), as appropriate, and the State Register Act (chapter 34.08 RCW).

(5) This order after being first recorded in the order register of this agency is herewith transmitted to the Code Reviser for filing pursuant to chapter 34.04 RCW and chapter 1-12 WAC.

APPROVED AND ADOPTED June 5, 1980

By Elmer C. Vogel
Elmer C. Vogel
Deputy Director
Title

STATE OF WASHINGTON
FILED

JUN 6 1980

CODE REVISER'S OFFICE
WSR 80-07-005

[Form CR-7: Effective 12/1/77]

WASHINGTON STATE DEPARTMENT OF ECOLOGY

INSTREAM RESOURCES PROTECTION PROGRAM-- GREEN-DUWAMISH RIVER BASIN, WATER RESOURCE INVENTORY AREA (WRIA) 9

Chapter 173-509 WAC

Authority:	Water Resources Act of 1971
	Chapter 90.54 RCW
	Minimum Water Flows and Levels
	Chapter 90.22 RCW
	Water Resources Management Program
	Chapter 173-500 WAC

Chapter 173-509 WAC
INSTREAM RESOURCES PROTECTION PROGRAM— GREEN-DUWAMISH RIVER BASIN, WATER RESOURCE INVENTORY AREA (WRIA) 9

NEW SECTION

WAC 173-509-010 PURPOSE. The purpose of this chapter is to retain perennial rivers, streams, and lakes in the Green-Duwamish drainage basin with instream flows and levels necessary for preservation and protection of wildlife, fish, scenic, aesthetic and other environmental values, recreational and navigational values, and to preserve water quality. Nothing in this chapter shall preclude the future issuance of regulations and/or signing of intergovernmental agreements which attempt to optimize the total public use of the basin water resources, providing they are consistent with the intent of this chapter. The instream flow rules presented here are for preservation of the existing resources so that when future planning or development occurs on this river these resources will be available.

NEW SECTION

WAC 173-509-015 BACKGROUND. The Green-Duwamish river basin has been modified significantly since settlement of the area. Urbanization in the lower basin has influenced water quality and diversions for municipal and industrial water supply have altered the stream flow of the Green-Duwamish river. Ground water has been developed for consumptive use within the basin. The White River originally had a confluence with the Green River near Auburn but since 1906 it has been diverted into the Puyallup River. A dam on the Black River near Tukwila prevents water from the Green River from flowing into Lake Washington during periods of high flow. In 1913 the City of Tacoma commenced diversions for municipal and industrial uses. Since 1962 the Green-Duwamish river has been influenced by the operation of the Howard A. Hanson Dam, a Corps of Engineers flood control project with authorization to provide instream flow maintenance of at least 110 cfs for fisheries conservation purposes. The operation has also considered drinking water quality requirements of the City of Tacoma.

The Green-Duwamish river basin is a natural rearing and spawning area primarily for steelhead trout and chinook, coho and chum salmon. Fish hatcheries are located on tributary streams and these contribute to total numbers of fish produced by the river system. The river itself and the shoreline also offer easily accessible recreational opportunities.

NEW SECTION

WAC 173-509-020 GENERAL PROVISION. These rules apply to all waters within the Green-Duwamish River Basin, WRIA 9 (see WAC 173-500-040). This chapter is promulgated pursuant to chapter 90.54 RCW (Water Resources Act of 1971), chapter 90.22 RCW (Minimum Water Flows and Levels), and in accordance with chapter 173-500 WAC (Water Resources Management Program). The provisions of this chapter apply, as a matter of State law, to future water right authorizations issued pursuant to the State's water rights codes.

NEW SECTION

WAC 173-509-030 ESTABLISHMENT OF INSTREAM FLOWS.

(1) Instream flows are established for stream management units with monitoring to take place at certain control stations as follows:

STREAM MANAGEMENT UNIT INFORMATION

Control Station No. Stream Management Unit Name	Control Station by River Mile and Section, Township and Range	Affected Stream Reach Including Tributaries
12.1130.00 Green River near Auburn, WA	32.0 17-21-5	From influence of mean annual high tide at low instream flow levels (approx-imately River Mile 11.0),to USGS Gage #12.1067.000
12.1067.00 Green River near Palmer, WA	60.4 13-21-7	From USGS Gage #12.1067.000 to headwaters.

The Palmer gage will be used to condition future water rights upstream from that gage. The Auburn gage will be used to condition future water right appropriations downstream from the Palmer gage. If it becomes necessary to change a control station location to improve measurement accuracy or management capability, the department shall do so under provisions in WAC 173-500-060(6).

2) Instream flows established for the stream management units in WAC 173-509-030(l) are as follows:

INSTREAM FLOWS FOR FUTURE WATER RIGHTS
IN THE GREEN-DUWAMISH RIVER BASIN
(in Cubic Feet per Second)

Month	Day	12.1130.00 Normal Year Green River Near Auburn	12.1067.00 Normal Year Green River Near Palmer	12.1067.00 Critical Year Green River Near Palmer
Jan.	1	650	300	300
	15	650	300	300
Feb.	1	650	300	300
	15	650	300	300
Mar.	1	650	300	300
	15	650	300	300
Apr.	1	650	300	300
	15	650	300	300
May	1	650	300	300
	15	650	300	300
June	1	650	300	300
	15	650	300	210
July	1	550	300	150
	15	300	150	150
Aug.	1	300	150	150
	15	300	150	150
Sept.	1	300	150	150
	15	300	150	150
Oct.	1	300	190	150
	15	350	240	150
Nov.	1	550	300	190
	15	550	300	240
Dec.	1	650	300	300
	15	650	300	300

(a) Future water right holders subject to regulation by the Palmer gage will not be allowed to continue diversions when flows fall below the normal year instream flows at the Palmer gage unless a critical condition is declared by the director. The director, or his designee, may authorize, in consultation with the State Departments of Fisheries and Game, a reduction in instream flows during a critical condition period. At no time will diversions subject to regulation by the Palmer gage be continued when flows fall below the critical year instream flows at Palmer. At no time will diversions subject to regulation by the Auburn gage be continued when flows fall below the normal year instream flows at Auburn. When a declaration of overriding considerations of public interest is made by the Director, these requirements may be modified or waived. A declaration of overriding consideration because of drought conditions shall not be made when natural flows equal or exceed the one-in-fifty year low flow condition. The director shall consult with the directors of the state departments of game and fisheries before making

a declaration of overriding consideration. Any declaration of critical conditions or overriding considerations of public interest made by the director shall be communicated to all basin resource agencies, water purveyors, and local general purpose governments, and include the reason for such declaration and its expected duration.

(b) The director will consider declaring a critical period when:

(1) In the spring the basin runoff volume forecast of May 1 is not adequate to meet the sum of any rights which the city of Tacoma may have established through historical usage prior to the adoption of this regulation plus the normal year instream flows plus the volume required to replenish the conservation storage.

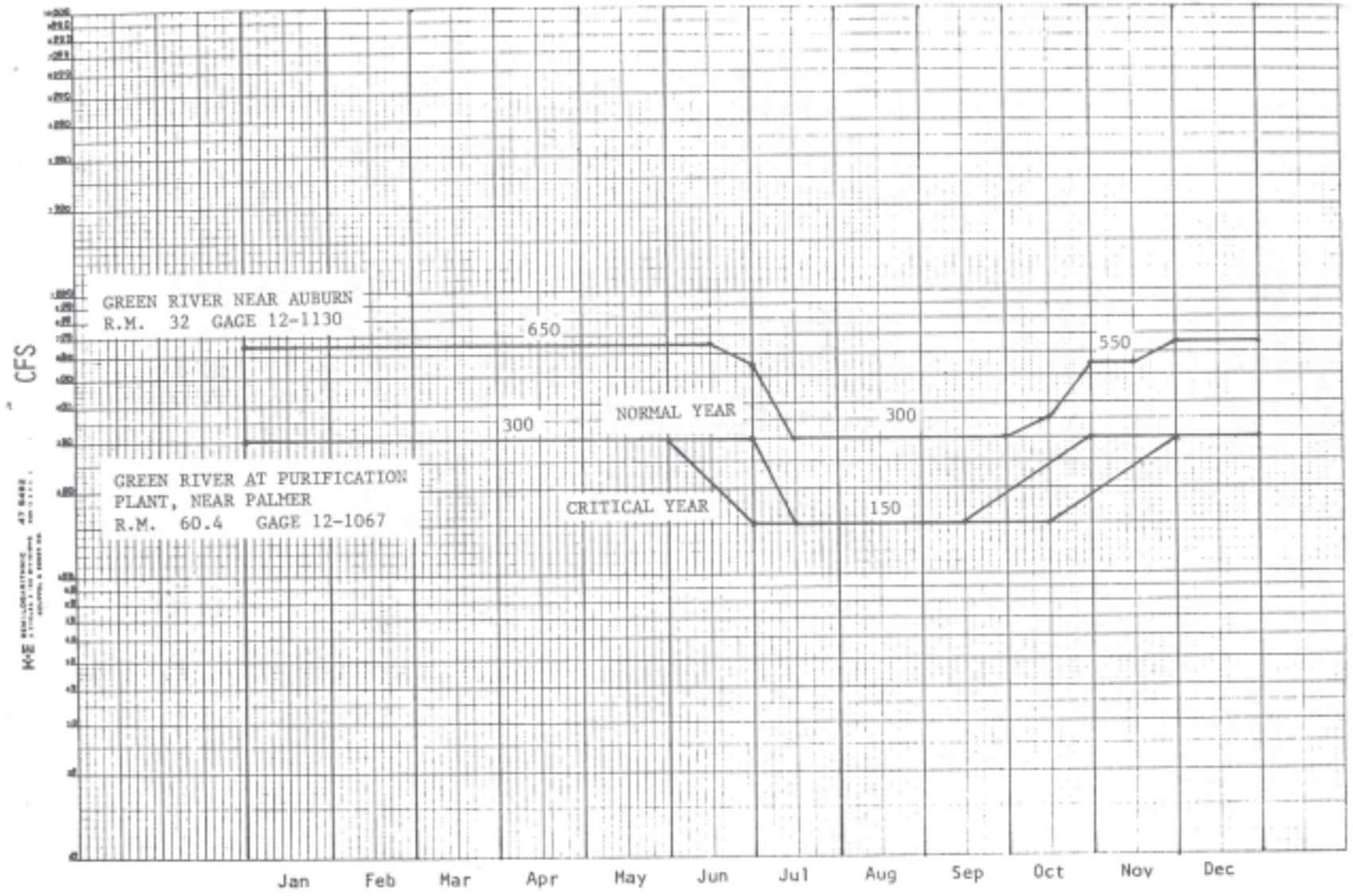
(2) In the summer and fall the sum of the reservoir inflows extrapolated from current observations plus the volume of water in storage at Howard A. Hanson Dam is not adequate to meet the sum of any rights which the city of Tacoma may have established through historical usage prior to the adoption of this regulation plus the normal year instream flows. Within five days the director will inform the major affected water right holders of the extent of the allowed deviation from the normal year instream flows. Once a deviation from normal year instream flows is allowed, the water resources shall be evaluated at least every 7 days to see if additional deviation is warranted. Before allowing deviation from the normal year instream flows, water conservation practices and use of other sources shall be considered.

(c) In addition to other necessary provisions, any diversion of the natural flow, including diversion to storage under future water rights shall cease (or be regulated to the extent necessary) when the flow at the applicable control station falls below (or is less than) the instream flows established by this regulation and made a condition of said future water right. Said future water rights are subject to the rights and authority of the Corps of Engineers to utilize for storage and conservation flows, the natural inflow to the Howard A. Hanson reservoir and to all other prior water right holders authorized use of natural flows, including any rights that the City of Tacoma may have established through historical usage. The use of stored waters is not to be impaired, limited, or diminished by this regulation.

The department recognizes that from time to time the Corps of Engineers may establish a minimum reservoir level 'which is necessary to provide conservation flows with a high measure of assurance. When the reservoir falls below this level it may be necessary for the Corps of Engineers to replenish conservation storage. When this occurs, water rights subject to the provisions of this chapter maybe temporarily regulated or diminished and the actual stream discharge diminished.

(3) Instream flows, as represented in Figure 1, shall be used for definition of instream flows on those days not specifically identified in WAC 173-509-030(2).

FIGURE I PROPOSED INSTREAM FLOWS FOR FUTURE WATER RIGHTS IN THE GREEN-DUWAMISH RIVER BASIN



(4) All consumptive water rights hereafter established shall be expressly subject to the instream flows established in WAC 173-509-030(1) through (3). However, nothing in this section shall prohibit the release or diversion of stored water or the use of any water course as a means for its conveyance in accordance with RCW 90.03.030.

NEW SECTION

WAC 173-509-040 SURFACE WATER SOURCE LIMITATIONS TO FURTHER CONSUMPTIVE APPROPRIATIONS. (1) The department, having determined there are no waters available for further appropriation through the establishment of rights to use water consumptively, closes the following streams to further consumptive appropriation for the periods indicated. These closures confirm surface water source limitations previously established administratively under authority of chapter 90.03 RCW and RCW 75.20.050.

SURFACE WATER CLOSURES

Stream	Date of Administrative Closure	Period of Administrative Closure
All tributaries of Green River SE¼SE¼ sec. 14, T.32 N., R.4E.	8/19/53	All Year
Deer Creek (including Hyde Lk.), tributary to Deep Lake NW¼SE¼ sec.18, T.21N., R.7E.	4/17/53	All Year
Unnamed stream (Des Moines Creek, Tributary to Puget Sound SW¼SW¼ sec. 8, T.22N., R.4E.	8/22/52	All Year
Unnamed stream (Garrison Creek), Tributary to Black River (indirect) NW¼NW¼NW¼ sec. 6, T.22N., R.5E.	10/18/51	All Year
Unnamed stream (Miller Creek) (Maybrook Creek), Tributary to Puget Sound NE¼NE¼ sec. 36, T.23N., R.3E.	1/7/46	All Year
Unnamed stream (Springbrook Creek), Tributary to Black River NE¼SE¼SW¼ sec. 13, T.23N., R.4E.	11/14/45	All Year

(2) The department, having determined that maximum lake levels have been established by court decree for certain lakes in WRIA 9, adopts the following lake levels. These maximum lake levels confirm lake levels previously established by order of the Superior Court for King County.

MAXIMUM LAKE LEVELS

Lakes	Lake Level Established	Date of Order
Angle Lake	349.27 ft. MSL	4/21/75
Star Lake	324.46 ft. MSL	9/20/50
Lake Sawyer (Tributary to Covington Creek)	518.94 ft. MSL	8/5/52

NEW SECTION

WAC 173-509-050 GROUND WATER. Future groundwater withdrawal permits will not be affected by this chapter unless such withdrawal would clearly have an adverse impact upon the surface water system contrary to the intent and objectives of this chapter.

NEW SECTION

WAC 173-509-060 FUTURE RIGHTS. No right to divert or store public waters of the Green-Duwamish river basin, WRIA 9, shall be granted which shall conflict with the purposes of this chapter: provided however, withdrawals of water which would conflict with said purposes may be authorized in those situations where it is clear that overriding considerations of the public interest will be served.

NEW SECTION

WAC 173-509-070 EXEMPTIONS. (1) Nothing in this chapter shall affect water rights, riparian, appropriative, or otherwise, existing on the effective date of this chapter, nor shall it affect existing rights relating to the operation of any navigation, hydroelectric or water storage reservoir or related facilities, including but not limited to:

(a) Howard Hanson Dam storage and operation as authorized in the Flood Control Act of May 17, 1950; (b) any existing right the City of Tacoma may have.

(2) Domestic inhouse use for a single residence and stock watering, except that related to feed lots, shall be exempt from the provisions of this chapter.

(3) Storage projects may be approved if they are not in conflict with the purposes of this chapter.

NEW SECTION

WAC 173-509-080 ENFORCEMENT. In the enforcement of this chapter, the department of ecology may impose such sanctions as appropriate under authorities vested in it, including but not limited to the issuance of regulatory orders under RCW 43.27A.190 and civil penalties under RCW 43.83B.335.

NEW SECTION

WAC 173-509-090 REGULATION REVIEW. The rules in this chapter shall be reviewed by the department of ecology at least once in every five-year period. The director shall initiate a review of the rules by appointing a committee of major affected water right holders, basin resource management interests, and governmental agencies.

NEW SECTION

WAC 173-509-100 IMPLEMENTATION. In the event the COE is authorized to change the operation of Howard Hanson Dam in order to meet the stream flows established in this chapter and so advises the director, these regulations shall be reviewed by the department within 180 days of the COE authorization to determine, what, if any, amendments are required to maintain the integrity and purpose of this chapter.

APPENDIX B

FINAL
SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

INSTREAM RESOURCES PROTECTION PROGRAM
GREEN-DUWAMISH RIVER BASIN, WATER RESOURCES INVENTORY
AREA (WRIA) 9

FINAL

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

GREEN-DUWAMISH BASIN

INSTREAM RESOURCES PROTECTION PROGRAM

State of Washington
Department of Ecology

April 1980

INTRODUCTION

This proposal is one element of a broader program entitled the Western Washington Instream Resources Protection Program (WWIRPP). This program aims at establishing instream flows on all Western Washington streams. An overall programmatic environmental impact statement was prepared covering all of Western Washington. It was circulated for comment and finalized in June of 1979. In the case of the Green-Duwamish Basin, the Department of Ecology (DOE) decided there were some significant environmental issues peculiar to this basin, which needed further analysis before a proper decision on the proposed instream flows are made. Therefore, this supplemental Environmental Impact (EIS) Statement has been prepared.

The programmatic EIS, as well as the references within it, are incorporated by reference into this supplemental statement. Also included is the preceding Green-Duwamish Basin program document as well as the additional references listed in Appendix i.

Lead Agency:	Washington State Department of Ecology	
	Responsible official:	Eugene Wallace, Division Supervisor Water Resources Management
	Contact Person:	Rod Sakrison Washington State Department of Ecology Olympia, WA 98504 Phone - (206) 753-2807
Author:	Tom Elwell, DOE Environmental Review Section	
Licenses Required:	Department of Ecology – Adoption of Proposed Rules	
	U.S. Army Corps of Engineers –	Adjustment of Operating method at Howard Hansen Dam
Background Data:	See Appendix i	
Cost to the Public:	Individual copies of this FEIS may be obtained free from DOE while supplies last	
Date of Issue:	Draft EIS December 21, 1979 Final EIS April 14, 1980	
Distribution:	See Appendix ii.	

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LIST OF FIGURES

SUMMARY

The Washington State Department of Ecology proposes to implement the Western Washington Instream Resources Protection Program in the Green-Duwamish Basin by adopting the preceding regulation (Appendix A). The proposal would close all basin waters except the main-stem Green River to further consumptive appropriations. An instream flow with attendant critical year provision would be imposed on the Green. The major feature of the proposed instream flow is the provision to be placed on future rights of 150 cfs during the summer, as measured at Palmer, WA. The current 110 cfs maintained by releases from Howard Hanson Dam would not be affected by the instream flow established in Chapter 173-509. DOE will request that the Corps pass additional inflow during the low flow period to create higher minimum flows without relying on the Corps' storage. This would benefit instream values including fish.

During the review period for the draft EIS and program document, there was considerable agency and citizen concern. On the evening of February 7, 1980, a public hearing was held in Auburn and on March 10, 11, and 12, all day multiagency work sessions were held at the City of Tacoma Public Utilities Building. Summaries of these sessions are contained in appendices E, F and G.

In each of these sessions, as well as in the comment letters on the draft EIS, it was obvious that some confusion existed about the actual effect implementation of the DOE proposal would have. The following points need to be understood:

1. The proposal will not affect existing water rights.

2. The proposal would mean that new water users would be required to cease diverting when flows instream fell below the established instream flows.

3. Once water is legally diverted to storage, it becomes the property of the permittee and can be used as permitted regardless of instream flow restrictions.

4. The proposal will have no direct effect on the Corps of Engineers storage and release of 110 cfs during the summer months. During periods of very low natural flow there will still be only the 110 cfs in the stream.

5. DOE does feel that 150 cfs would be a more reasonable number than 110 cfs. If natural flows allow, DOE would urge the Corps to meet the 150 cfs figure. There is no suggestion that the existing storage be drafted at a rate greater than 110 cfs.

6. Sometime in the future, a request to store additional water so that 150 cfs could be released in times of low natural flow could be made. This is not part of the current proposal but should be part of any reauthorization study by the Corps.

It is uncertain how the proposal will affect the city of Tacoma's pending request for water to supply its proposed pipeline number 5. This will be known after studies by the city and the Corps of Engineers to determine the amount of additional storage necessary.

No adverse environmental impacts are foreseen.

The DOE proposal will be automatically reviewed within five years.

PROPOSED ACTION

The proposed action is the adoption of the preceding regulation as Chapter 173-509 WAC. The Washington State Department of Ecology, Olympia, WA 98504 is the proponent.

As described in the preceding program document, portions of the system have been administratively closed for several years. This proposal would continue these closures. The main stem of the Green River remains open and pending applications for water rights will be processed. Instream flows for the Green-Duwamish, established in Chapter 173-509 WAC will condition all future consumptive water rights.

It is important to understand that this proposal will not cause the designated instream flow to occur. It will only mean that future water rights will be conditioned so that they themselves will not be the cause of flows less than the established level. If natural flows, less existing diversions, leave less than the instream flow in the stream, so be it. In this case, the only effect of this regulation would be that new diversion would be curtailed so that the situation would not be worsened by them.

The Corps has established storage capable of providing at least 110 cfs for instream flows in the summer months, even if there is no inflow. In actuality, significant inflows do occur. Tacoma has rights to 112 cfs of this inflow. If inflow is greater than 112 cfs, DOE feels that it should be applied to increasing the 110 cfs to 150 cfs. DOE does not propose to draft storage for this purpose. However, if the Corps should study the Howard Hanson project for reauthorization, DOE feels that increasing storage so as to provide 150 cfs should be studied.

The relationship of the proposal to land use plans is discussed in the preceding program document.

EXISTING CONDITIONS AND ENVIRONMENTAL EFFECTS

General

The purpose of this supplemental EIS is to focus on those issues which will be significantly affected by the proposal and which have not been adequately covered in the programmatic EIS already published. This is not only to avoid a voluminous document, but also to provide a concise summary of the important issues to the decision makers.

As described in the programmatic EIS, the purpose of regulating instream flows is to protect instream values including fish, recreation, navigation, water quality, wildlife, and aesthetics. The proposal for the Green-Duwamish Basin is designed to accomplish these goals and is the product of long and involved interagency deliberations.

This proposal is quite different from proposals which ordinarily are considered in EIS's in that the proposal is really one to not do some- thing. Closure or instream flow limits will mean that water will not be diverted for out-of-stream uses or will not be diverted if the stream would be

depleted below the low-flow limit. In this sense, the proposal will not lead to adverse environmental impacts. In fact, the purpose of the proposal is to protect instream values from the dangers of over- appropriation. However, out-of-stream uses (new irrigation, new municipal, and industrial water supply, etc.) may be limited. This would be viewed as adverse by the potential users. Conversely, some proponents of instream values (fisheries interests, recreational users, etc.) may feel that the proposed instream flows are too low and that their interests would be better served by setting a different instream flow level.

In order to appreciate which factors will be affected by the program and which will not, it is necessary to understand the workings of the Green-Duwamish Basin system. The preceding program document provides this background.

The proposal will not mandate changes in the flow in the river. River flow is controlled by the interaction of natural runoff and the Corps of Engineers' operation of Howard A. Hanson Dam. If adopted, the proposal would be implemented in two primary ways:

1. Any water rights issued after adoption of the regulation would be conditioned to the new instream flow. Diversions would cease when the normal year flows are not available. Violations of the restriction may be allowed during critical years. The City of Tacoma has water rights pending, which would be affected.

2. The Corps of Engineers would be asked to change its operational plan for the dam and to pass excess inflow during the summer period to allow flows equal to the instream flows. The flows would not be required to be met from storage.

It has yet to be determined if additional municipal water supply would necessitate increasing the storage or altering the operation of Howard A. Hanson Dam.

Major impacts of the proposal have been addressed in the preceding program document. What follows will not repeat this information, but rather will discuss in more detail the two areas of primary impact. These are municipal water supply and the fishery resource. Other areas either will not be impacted or have already been adequately discussed.

Specific Issues:

Municipal Water Supply

The City of Tacoma receives a large portion of its municipal and industrial water from the Green River. Water is diverted just downstream of the Howard Hanson Dam and piped a couple of miles further downstream to Palmer, where a chlorination plant is located. It is then piped to McMillin reservoir located south of the city of Puyallup. From McMillin, water is distributed to the city.

At times, Green River water is turbid. At one time, Tacoma simply spilled turbid water at McMillin and used stored water until the river cleared. In 1972, in an effort to assure a constant supply of better quality water, the city installed a series of shallow wells on the north side of the Howard Hanson Reservoir. Water from the well field is piped to Palmer where it can be mixed with, or substituted for, Green River water to tide the city over short periods of excessive turbidity in the river.

Based on one of its authorized purposes, Howard Hanson Dam releases at least 110 cfs during the normal low-flow period as long as storage is available. This is for the protection of instream values and is in addition to whatever water Tacoma might remove from the river. Tacoma's diversion technically comes from natural flow in the river.

To meet its commitment to 110 cfs for minimum streamflows, the Corps must store water in the reservoir in the spring. Heavy rains or rapid snowmelt can cause excess turbidity in the stored water. Since Tacoma's water must pass through the reservoir and turbid water is unacceptable to the city, the practice is to store water as late as possible to miss high flows with high turbidity. If excess turbidity does occur, the reservoir is emptied and then refilled. The availability of water to refill the reservoir is estimated from measurements of the snowpack in the watershed.

Tacoma has plans to install a new pipeline leaving Palmer. It would serve the Federal Way area. In order to have a guaranteed supply of water to serve this new pipeline, Tacoma may need to arrange for the Corps to store more water in the spring. Tacoma has asked the Corps to study the feasibility of storing an additional 24,000 acre-feet in Howard Hanson Reservoir. This could make refilling the reservoir with water of acceptable quality more difficult.

At the present time, the Green River watershed is "controlled," meaning that access is limited and under state regulations, only chlorination is required before water is delivered to customers. This is an economic advantage to Tacoma, as an expensive water purification plant is not required. However, two factors could alter this situation:

1. The U.S. Forest Service which controls the upper reaches of the watershed is considering opening their land to public access. This would likely destroy the "controlled" nature of the watershed and necessitate a treatment facility.

2. If the probability of having to store turbid water in the reservoir should become unacceptably high, Tacoma would have to install a purification plant anyway. Tacoma believes the additional pipeline can be successfully completed without the need for a filtration plant.

Additional storage would mean less flexibility to fill the reservoir with water of acceptable turbidity. This worries Tacoma, since they do not wish to increase the probability of having to use turbid water or install an expensive purification plant. Interestingly, initial analysis by interactive computer simulation estimated that on a monthly basis the additional pipeline demand

and the new instream flow requirements could be met by only a slight increase in existing storage. Actually, storing additional water is not as simple as it might seem, even without the potential turbidity problem. The dam was built with the idea of only maintaining a low pool to meet the 110 cfs flow for fisheries. A volume of 25,649 acre-feet is stored for this purpose. This corresponds to an elevation of 1,141 feet. The empty reservoir is about 1,070 feet. Maximum reservoir capacity is 106,000 acre-feet at an elevation of 1,206 feet. While the Corps owns the reservoir up to the 1,141-foot level, it only has flooding easements above that. Above 1,200 feet, the reservoir could impact the Burlington-Northern rail line. Between 1,141 feet and 1,200 feet, about 69,000 acre-feet are available. It is unknown if the dam will be able to store the additional 69,000 acre-feet for an extended period without experiencing some leakage problems. Structural changes might be required.

There is also the problem of obtaining significant additional water on a regular basis. Storage would have to begin earlier than at present and the chance of excess turbidity could be greater. If the pool was elevated too early, flood protection would be lost and the chance of excess turbidity could be greater. If storage began too late, the total storage required for all purposes might not be obtained.

The DOE proposal would accommodate these uncertain factors in several ways. First, a normal year flow and a critical year flow would be established for applications which would use stored waters. DOE would condition any new water right to these flows. In a normal year, the DOE normal year flow would be expected, however, if exceptional conditions existed, flows as low as the critical year figure could be allowed. The change from normal to critical year would require application to the Director of DOE. DOE would expect flows lower than normal to occur no more than 10 percent of the time. The effect of this would be to allow Tacoma to calculate its water availability on the basis of the less-strict critical year flow.

DOE proposes to process the city's water right application on the basis of the flows established in this program. However, the city would have to approach the Corps to obtain whatever additional storage is necessary. The Corps may have to do a comprehensive study of the reservoir before granting the request. That study would establish the storage levels that can be achieved. At that time, DOE could reassess its flows to determine if they should be altered, based on the additional information from the Corps' study. In any case, the DOE flows would be automatically reviewed within five years.

In effect, adoption of the DOE proposal will establish an initial position from which to assess the water supply question. A final solution must await the detailed study by the Corps.

Fishery Resource:

The State Department of Fisheries publication, Catalog of Washington Streams and Salmon Utilization, Volume 1, Puget Sound, is the basic reference for anadromous fish. It formed the basis for the discussion in the preceding program document. The following information, supplied by the Department of Fisheries, supplements and updates the catalog:

Three species of salmon are produced in the Green River system: chinook, coho, and chum salmon. Of these, chinook and coho presently far predominate. Chum salmon were once abundant, but in recent years have been of minor importance. Historically, the Green River also supported pink salmon, but they have been unreported in the system for many years. Because of their past abundance we consider the Green River system still to retain the potential for chum and pink salmon production. The Muckleshoot Indian Tribe has, in recent years, been propagating chum salmon at their facility on the Green.

The timing for freshwater life phases illustrated in the diagram in the stream catalog [see program document] appears to be accurate, and this serves as the basis for the Department of Fisheries recommended stream flows. Of concern has been the timing of fall chinook migration, and particularly the peak of spawning, which normally occurs between September 25 and October 10. Timing of all developmental phases for the other species appear compatible with normally anticipated stream flows.

The following information on production from the Green River system is taken from Department of Fisheries publications and mathematical models being used for management.

Coho and chinook salmon production in the Green River Basin is comprised of both hatchery and naturally produced segments, with each being of considerable importance. Current production values have changed somewhat from those given in the stream catalog due to additional data on wild fish production. Hatchery production has also increased due to improved or new facilities.

A harvest model for Washington salmon production is presently being developed by WDF based on several years of coded wire tag recovery data. The most recent computer runs are believed to be reliable, although still subject to review. Output includes detailed distribution of catches, catch rates, and catch/escapement ratios for the southern Puget Sound management area, which includes the Green River Basin. Since most of the tagging data applies to hatchery stocks, some careful considerations and assumptions must be made in application to natural production.

Chinook escapement to natural spawning areas has been estimated each year based on aerial surveys to count chinook redds. The twelve-year average escapement during this period is the basis for the present chinook escapement goal of 5,750 spawners. Based on this escapement level and a preliminary catch/escapement ratio estimate of 6.3, harvest of naturally produced Green River chinook is 36,225 annually. While Green River terminal chinook fisheries are managed to obtain the natural spawning escapement goal, which normally requires a lower harvest rate than for hatchery produced stocks, it is assumed that 20% of the hatchery fish that escape the fisheries will spawn naturally. Thus the overall harvest rate for naturally spawned Green River chinook approaches that of an artificial stock.

Distribution of the harvest of Green River chinook ranges from Oregon to Alaska, with the most important harvest segments, in descending order of importance, being the British Columbia troll fishery, Puget Sound sport fishery, and Puget Sound net fisheries (including those in terminal areas). Significant but less important contributions to the harvest include the Washington troll and B.C. sport fisheries. Overall, British Columbia fisheries account for 44.3% (16,048), while all Washington fisheries harvest 55.4% (20,069). The remaining 0.3% are shared by Oregon and Alaska.

Coho escapement and production is basically dependent upon the spacial requirement for rearing. Since coho spend the first year of their life in a stream environment, their abundance is directly proportional to the area available for rearing, and consequently low flows during the summer and early fall are directly correlated to production. This relationship has provided the basis for department coho forecasts, which have proved consistently accurate for many years. For more detailed information on the relationship of coho production to stream flows refer to Technical Report No. 28. Our present escapement goal for natural production in the Green River is 8,000 coho spawners.

Green River coho stocks are presently managed on the basis of strength of hatchery returns, and natural escapements tend to be depressed by a heavier fishery than they can normally sustain. Natural production is, therefore, supplemented through off-station releases to utilize the available rearing capacity of the system and retain its maximum productivity.

The catch/escapement ratio for coho, from the harvest model, is 5.82, thus the harvest contribution based on the escapement goal of 8,000 spawners is 46,560 coho annually. As with chinook, a major segment of the catch is taken in B.C., with minor catches in California, Oregon and Alaska. Washington fishermen catch 59.0% (27,470) of Green River coho, while the B.C. interception is 36.7% (17,080). The larger harvests, in descending order, are by the B.C. troll fishery, Puget Sound net fisheries (including terminal), Washington troll, Washington ocean sport, and Puget Sound sport.

The Department of Fisheries has major artificial production facilities located in the Green River watershed, including a large hatchery on Soos Creek and satellite facilities on Crisp Creek and Icey Creek. An additional facility is in the advanced planning stage in lower Icey Creek. Production capacity of these facilities depends upon the species being reared, whether coho or chinook.

The Soos Creek Hatchery presently has a capacity for 136,000 pounds annual production, with 310,000 cubic feet of rearing volume. The normal egg take at Soos Creek is between 4 and 5 million chinook, and approximately 3 million coho. This station also takes additional eggs and serves as a mother station to other hatcheries in Western Washington. The typical releases would total 4 million chinook salmon fingerlings and 2 million coho smolts. Maximum water utilization, occurring in the spring of the year, is 38 cubic feet per second. This is a nonconsumptive use.

> "The Crisp Creek satellite has capacity for 50,000 pounds of annual production, primarily for the rearing of approximately 1 million coho smolts. Peak water usage is 7 cfs during spring months, providing water to 190,000 cubic feet of rearing volume. Icey Creek has a capacity for production of 23,000 pounds annually, and is used predominately for fall chinook salmon. Typical releases are 1 million fingerling and 70,000 yearling chinook salmon. Rearing volume is 24,000 cubic feet, with a peak flow of 21 cfs. When the lower Icey Creek satellite comes on line, production will total 50,000 pounds or 400,000 yearling chinook."

It would be very useful to present graphs correlating flow levels and anadromous fish production in a definitive manner. However, this information is not available. Relationships between flow and available spawning area are available, but the relationship between spawning area and fish production is not well defined enough to complete the picture. This is not to suggest that a relationship does not exist. Certainly, fish cannot live where there is no water and cannot spawn in dry gravel, it's just that a clear formula showing fish per cfs does not exist. Rather, we must rely on the professional judgment of fish biologists who are intimately familiar with the stream in question.

Department of Fisheries Technical Reports 28 and 29 demonstrate the problem. One does not count the actual number of young produced and successfully reared. Rather, one counts the fish which have left the stream, survived in the sea, and escaped the fishery to return as spawning adults. Since all of the other sources of mortality are not precisely known, that por- tion of mortality attributable to stream flow is difficult to estimate,

As discussed in Technical Report 28, the number of returning coho does show a reasonable relationship to stream flow during the rearing stages. This relationship has been used to predict run size with some success. Coho spawn in tributaries to the Green River and rear in the tributaries as well as the main stem. However, Fisheries has determined that in main stem areas the fish tend to stay close to the bank. After the stream has reached a width of about six yards, an increase in flow level does not increase rearing capacity because the amount of streambank does not increase.

The proposed DOE program would continue the existing closure on tributary streams. Nothing more could be done on these. Since the existing flow of 110 cfs on the Green River keeps the river at least six yards wide, no benefits to coho rearing are foreseen if a higher flow is created.

Chinook are quite different. They rear in the main stem river as described in Technical Report 29. The only reliable method of estimating the run size, which has so far been developed, is to actually count the redds and relate the number to known harvest rates. No clear relationship has been developed between flows and numbers. Again, this does not mean that none exists, however, the relationship is masked by other physical and biological variables acting on individual stocks.

Flows are also important to downstream migration. It is interesting to note that providing high flows for downstream transportation in the spring may use water which would be better used as storage for maintaining fall flows. This is another example where professional judgment is the best tool.

Steelhead trout spawn between January and May. The young spend two summers in the stream and go to sea in the fall high flows to return with the high flows two year later. Appendix iii contains an attempt by the State Department of Game to correlate late summer low flows and steelhead production. It suggests that there is a positive relationship, but the results are not conclusive due to the small sample size.

Flows necessary for fisheries production cannot be proved, although common sense tells us they must be important. The object of the DOE program is to recognize this uncertainty, rely on the best professional, judgment of fisheries biologists, and recognizing the importance of the Green River fishery, attempt to provide the level of flow deemed necessary.

ECONOMICS

The additional storage Tacoma may require for its new pipeline may cause too great a turbidity problem for the city and a water treatment facility may be necessary. However, this is not certain. This will only be known after detailed studies by Tacoma and the Corps.

The draft of Green River Water Supply Capabilities from the City of Tacoma indicates that Pipeline 5 can be supplied under the provisions of Chapter 173-509 without being impacted by turbidity. Feasibility of the additional water supply project is probably assured and will fill the immediate needs of South King County and Greater Tacoma. Future water supply may be available from the Green River, should additional storage beyond that required for Pipeline 5 be developed. The instream flow requirements should not impose any growth restrictions due to source limitations on south central Puget Sound.

The fishery resource is very valuable, but no dollar figures will be attempted. The Green River system is among the most valuable fishery streams in Puget Sound, but since no quantitative relationship has been established between fish and flow, an economic analysis of fish would not be reliable. The most straightforward economic analysis is that we do not know.

ALTERNATIVES AND MITIGATION

In the programmatic EIS, the following alternatives were discussed:

1. No action.
2. Various methods of establishing instream flows.
3. Use the minimum flow technique.
4. Do complete basin plans.
5. Declare a moratorium.

These alternatives are all available in the Green-Duwamish Basin.

Alternatives Specific to the Green Basin

During the evaluation of the proposed regulations, many different flow regimes were suggested. The following graph, (figure 1) depicts some of these as they would appear at the Auburn gauge. Each of these, as well as a large number of variations on each, have been considered.

The solid line shows the 50 percent exceedence level as adjusted for natural conditions. On any given date, at least this amount would be present in 50 percent of the years of record. Conversely, under natural conditions, this level would not be achieved 50 percent of the years.

Using the instream flow methodology explained in the programmatic EIS, the department arrived at the hydrologic base flow. This initial position was then used in discussions with other interests (Fish, Game, Tacoma Water Dept., etc.)

In 1977, the Fisheries Department had recommended flows. This was based on what Fisheries felt to be the best flows for salmon. Later, the Game Department recommended flows. This flow was what they felt to be best for steelhead and resident fishes. These flows are shown on the graph.

Not shown on the graph are later flows developed by Fisheries and Game that merge the prior recommendations. Elements of the combined recommendations are similar to DOE's proposed instream flows: the high flow period (650 cfs) and transition dates in the spring (July 1-July 15) and fall (Sept. 25-Oct. 10).

The City of Tacoma has recommended a flow based on the current Corps release of 110 cfs at Palmer. This is not shown on the graph but can be visualized as a flat line at about 260 cfs during the summer (110 cfs plus approximately 150 cfs local inflow).

Extensive discussions led to the proposed flows. DOE has proposed for adoption a high period flow of 650 cfs with the knowledge that this satisfying the fish and game agencies, and accomplishes nearly the maximum provision of spawnable area. Figure 2 displays the spawnable area to discharge relationship which was instrumental in setting the flows. The DOE proposed spawning flows of 650 cfs provides over 95 percent spawnable area.

UNAVOIDABLE ADVERSE IMPACTS

No unavoidable adverse environmental impacts are anticipated. In fact, the purpose of the program is to guard against them.

SHORT-TERM V. LONG-TERM AND IRREVERSIBLE COMMITMENTS OF RESOURCES

Refer to programmatic EIS.

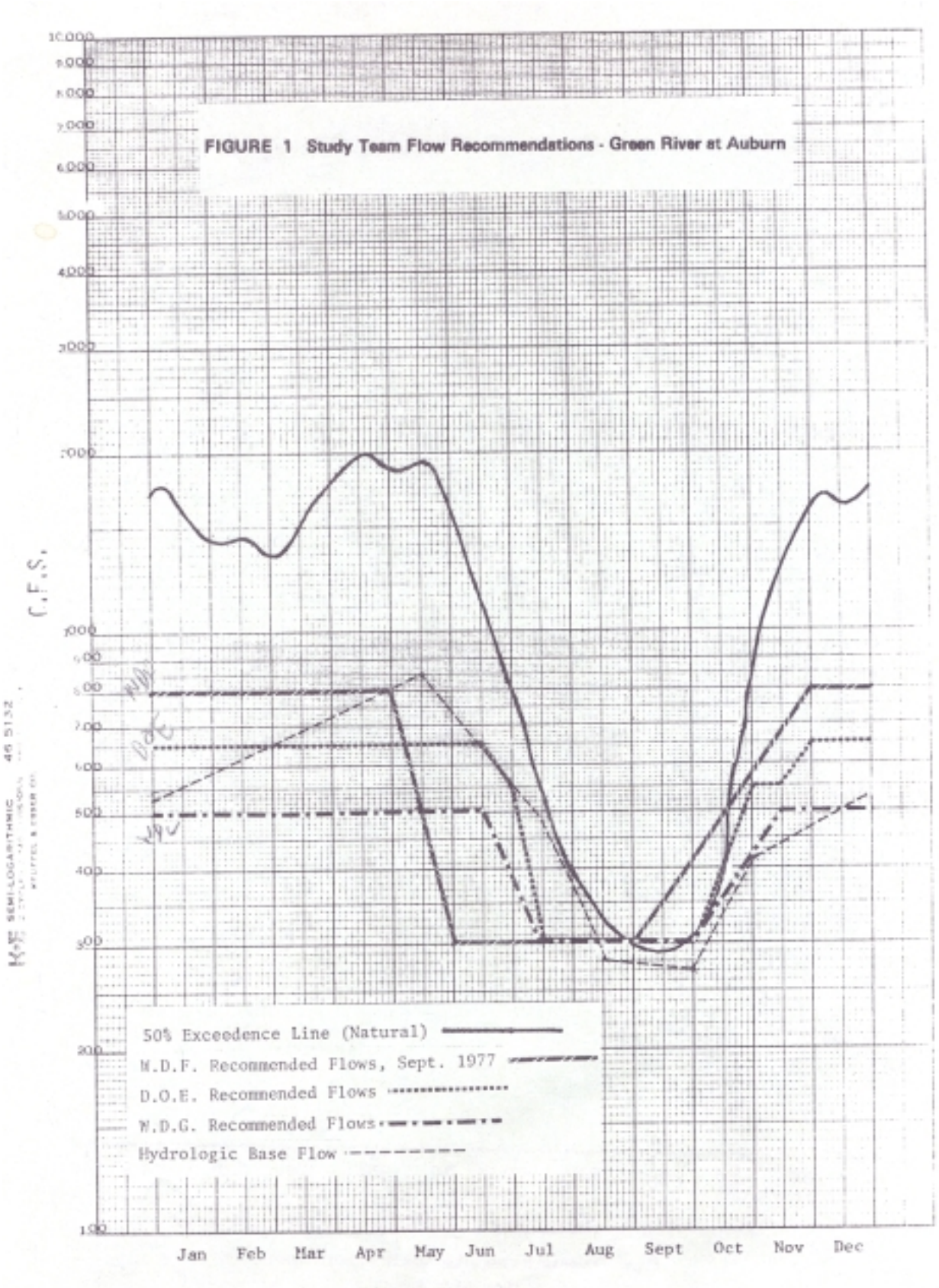
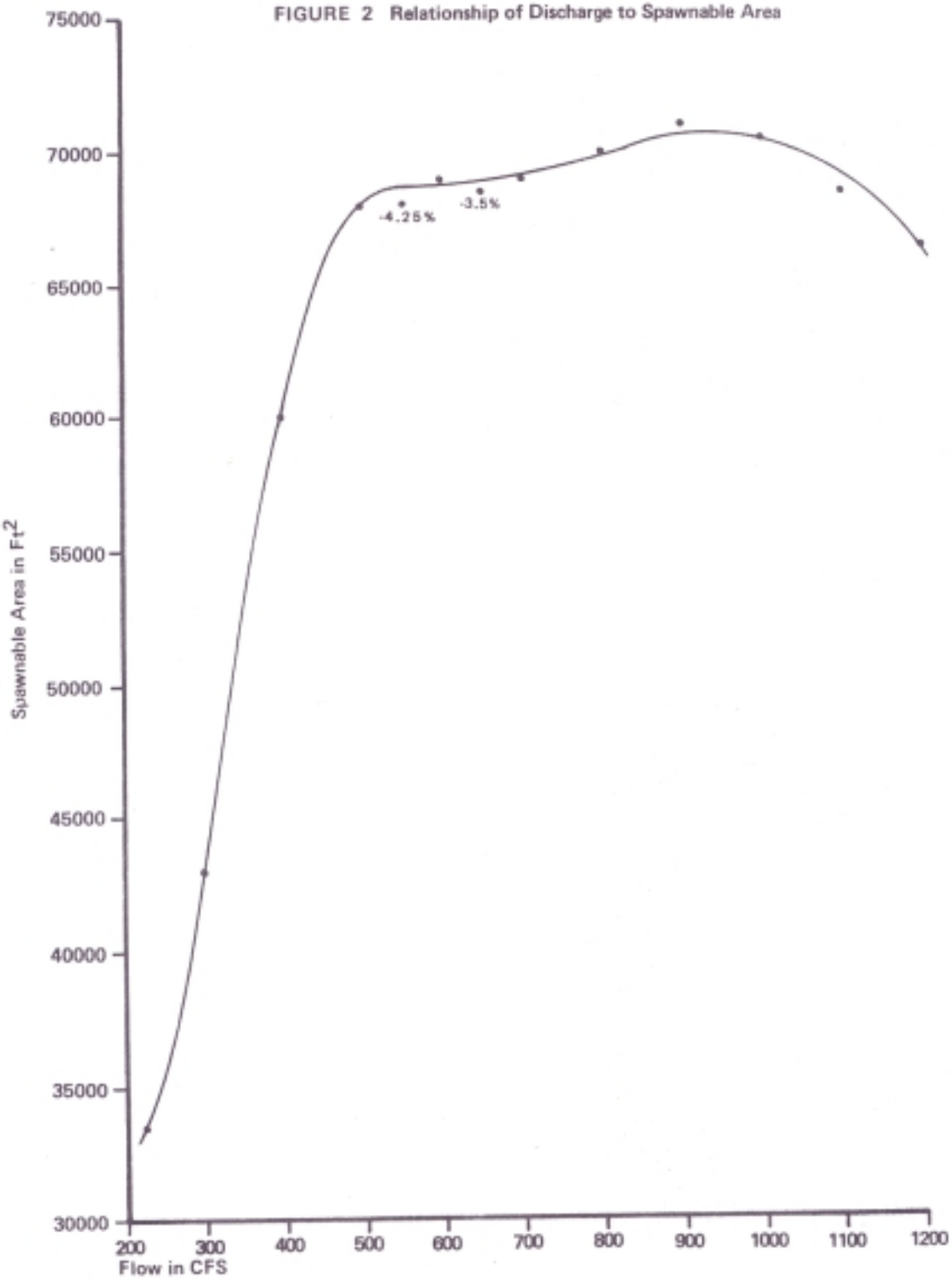


FIGURE 1 Study Team Flow Recommendations - Green River at Auburn
C.F.S.
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3000
2000
1000
900
800
700
600
500
400
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
50% Exceedence Line (Natural)
M.D.F. Recommended Flows, Sept. 1977
D.O.E. Recommended Flows
M.D.G. Recommended Flows
Hydrologic Base Flow

FIGURE 2 Relationship of Discharge to Spawnable Area



CUMULATIVE SPAWNING AREA - GREEN RIVER - Reaches A, B, & C.

Green - Duwamish Instream Resources Protection Program

As Measured At Auburn

APPENDICES

i Documents Incorporated by Reference

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Howard, Charles, and Associates, 1980. Green River Water Supply Capabilities, Draft Report. (Tacoma Utilities - Water Division). Charles Howard and Associates Ltd., Vancouver, British Columbia. 108 pages.

ii - Distribution List.

State Agencies

Washington State Ecological Commission
Department of Natural Resources
Department of Social and Health Services
Department of Game
Department of Fisheries
Department of Agriculture
Department of Commerce and Economic Development
State Energy Office
Utilities and Transportation Commission
Planning and Community Affairs Agency
Governor's Office of Financial Management
Parks and Recreation Commission
Interagency Commission for Outdoor Recreation
Department of Transportation
Oceanographic Commission
Energy Facility Site Evaluation Council
State Conservation Commission

Local Agencies

King County
Pierce County
City of Tacoma
City of Seattle
City of Bellevue
City of Auburn
City of Kent
City of Renton
City of Enumclaw
City of Mercer Island
Town of Pacific
Town of Algona
City of Tukwila
Port of Seattle
Muckleshoot Indian Tribe
Municipality of Metropolitan Seattle
Puget Sound Council of Governments
King County Extension Service
King County Conservation District
City of Seattle Water Department
Local County Water Districts
Washington Association of Water Districts
Washington State Association of Counties
Association of Washington Cities

Federal Agencies

U.S. Forest Service
Fish and Wildlife Service
Corps of Engineers
U.S. Geological Survey
Pacific Northwest River Basins Commission
Bonneville Power Administration
National Marine Fisheries Service
Federal Energy Regulatory Commission
U.S. Soil Conservation Service
Environmental Protection Agency
Department of Energy
Heritage Conservation and Recreation Service
National Oceanic and Atmospheric Administration

Public Groups and Individuals

Audubon Society
Washington Environmental Council
Friends of the Earth
Nature Conservancy Sierra Club
Pacific Northwest Waterways Association
Washington PUD Association
Puget Sound Power and Light
Weyerhaeuser Co.
Steelhead Trout Club of Washington
Washington State Sportsmen's Council
Purse Seine Vessel Owners Association
South King County Steelheaders
Washington Kayak Club
University of Washington College of Fisheries
Norman Associates
Fisheries Research Institute
Robinson & Noble
Seattle Master Builders Association
Bechtel, Inc.
R. W. Beck Co.
Evergreen Legal Services - Native American Project

iii Report on Steelhead.

Low Stream Flow and Steelhead (Salmo gairdneri) Production
by Hal Beecher, Washington Department of Game

Introduction

The relationship between stream flow and salmonid production has only recently received attention. Instream flow is one of many natural resources which decline in the face of an expanding human population. As in most cases of natural resource conservation, the burden of proof of the resource's value is placed, rightly or wrongly, upon the conservationists. In this paper, evidence for a dependent relationship between steelhead trout (Salmo gairdneri) production and late summer low flows will be analyzed and selected literature will be reviewed.

The hypotheses of interest are the null hypothesis (H_O) and the alternative hypothesis (H_A). $H_{Q:}P = O$, H_A:P O, where P is the correlation coefficient relating lowest stream flow and one of several indices of steelhead production. The sample correlation coefficient, r, is used to estimate P.

Methods

Data on steelhead fry and juvenile abundance in tributaries of the Green River system of King County, Washington, were obtained from quarterly Steelhead Program Progress Reports and from a report by Vail and Oppermann (1977), all provided by Steelhead Data and Management, Fisheries Management Division, Washington Department of Game. Creel census data for the Green River were provided by Dr. Peter Hahn (Steelhead Data and Management). Flow data for the Green River at Auburn were obtained from publications of the U.S. Geological Survey (1974-1979).

The numbers of wild winter steelhead in Green River creel censuses for 1975-76, 1976-77, 1977-78, and 1978-79 were plotted against the lowest daily flow recorded during the summer two and a half years earlier (i.e., 1973, 1974, 1975, 1976). A sample correlation coefficient, r, was calculated. Numbers of age 0+ steelhead fry in several tributaries of the Green River (Soos Creek, upper and lower sections of Newaukum Creek, upper and lower sections of Covington Creek, and Jenkins Creek) were plotted against the lowest daily flow at Auburn during that summer and fall. Data were available for 1976, 1977, and 1978. The small sample size (n=3) at each site prevented a test of H_A v. H_Q as presented in the introduction. Instead, regression lines were fitted by eye for each stream section. Slopes were rated as positive or not positive. (The probability of a slope (b) being zero approaches zero: P(b=O) O.) The null hypothesis of interest was that P (b O) = P (b O) = 0.5. A binomial probability for the frequency of positive slopes was calculated.

Results

The relationship between wild Green River steelhead catch and the lowest late summer flow two and a half years earlier is shown in Figure 1. The correlation coefficient, r, for these two variables is .78 (P .05). This r value, although not significantly different from 0, given the small sample size (n=4), is nevertheless suggestive of a positive relationship between low stream flow and steelhead production.

The relationship between summer low flow and abundance of young-of-the- year steelhead fry is shown in Figure 2. In five of the six stream segments, a positive slope was fitted by eye to the three points. The binomial probability of at least this many positive slopes, if it is assumed that no relationship exists, is .109 (P (T 5 n=6) = P (T=5) + P(T=6) = .094 + .015 = .109). This probability is not statistically significant at the generally accepted levels (.10, .05, .01). However, given the small sample size (n=6), the results suggest a relationship between stream flow and steelhead production and do not warrant outright acceptance of H_O.

Discussion

The data presented suggest a positive relationship between low flow and steelhead production, but results are not conclusive. The small sample sizes reduced the power of the statistical tests used (i.e., there is a high probability of not rejecting H_O when H_O is false and H_A is true). The Washington Department of Game continues to gather data on steelhead production. As additional data accumulate, more conclusive tests should be possible, and it might become feasible to elucidate the relationship, if one exists.

Study of the effects of stream flow on anadromous fish production is complicated by a number of factors, so that multivariate analysis would be preferable to multivariate analysis. Flooding, as well as drought, can have a drastic impact on young fish (Bailey and Harrison, 1945; Beckman and Elrod, 1971; Hoopes, 1975; Beecher, 1979). Fish production may be limited by number of fish spawning, which may, in turn, be limited by marine survival, migration barriers, and production in previous years. Harvest can affect the number of fish spawning, but it can also be used as an index of production. Shepard (1973) has found that harvest of steelhead is affected by flow, but this effect may be independent of stream flow effects on spawning or rearing.

In the Lake Washington drainage system, multiple regression was used by the Game Department to analyze the relationship of steelhead harvest to summer low flows two and one half years earlier, smolt plant two years earlier, coho salmon troll harvest one year earlier and spring flows two years earlier. Computerized multiple regression programs normally enter the most highly correlated independent variable into the equation first (Nie, et. al., 1975).

Using steelhead harvest as the dependent variable, summer low flow was the first variable to be entered into the equation. The four-variable equation explained 74 percent of the variation in steelhead harvest.

Smoker (1953) found that annual commercial landings of silver (coho) salmon (Oncorhynchus kisutch) were linearly related to the average total runoff in Western Washington two years before the catch year. Zillges (1977) further documented this relationship. Steelhead and coho salmon could be expected to respond similarly to low flows, since both fishes have similar life history patterns.

In a study of resident salmonids in a large number of Rocky Mountain streams, Binns and Eiserman (1979) found that late summer stream flow was the first variable to be entered into an equation to predict trout standing crop. Twenty-two variables were examined.

It is obvious that trout and salmon cannot live in dry streambeds. A stream stops flowing before all water is removed from it, but flowing water is a requirement of most salmonids. It is logical that increased stream flow permits increased production of anadromous salmonids. Supporting evidence (although not conclusive) for the importance of stream flow to steelhead production has been presented here. Sensible fish resource management requires protection of stream flows.

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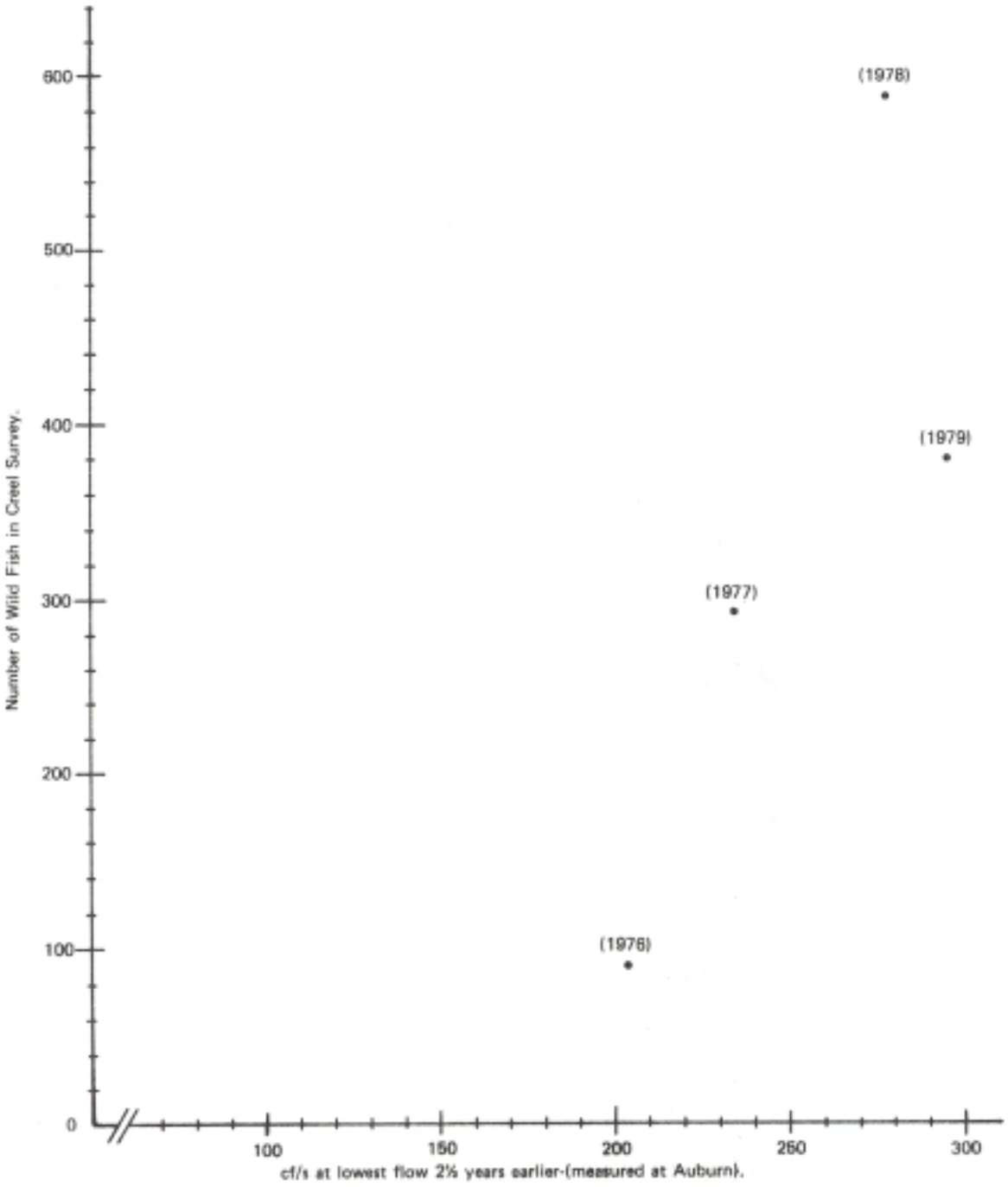


FIGURE 1. Wild Steelhand and Low Rearing Flows on the Green River.

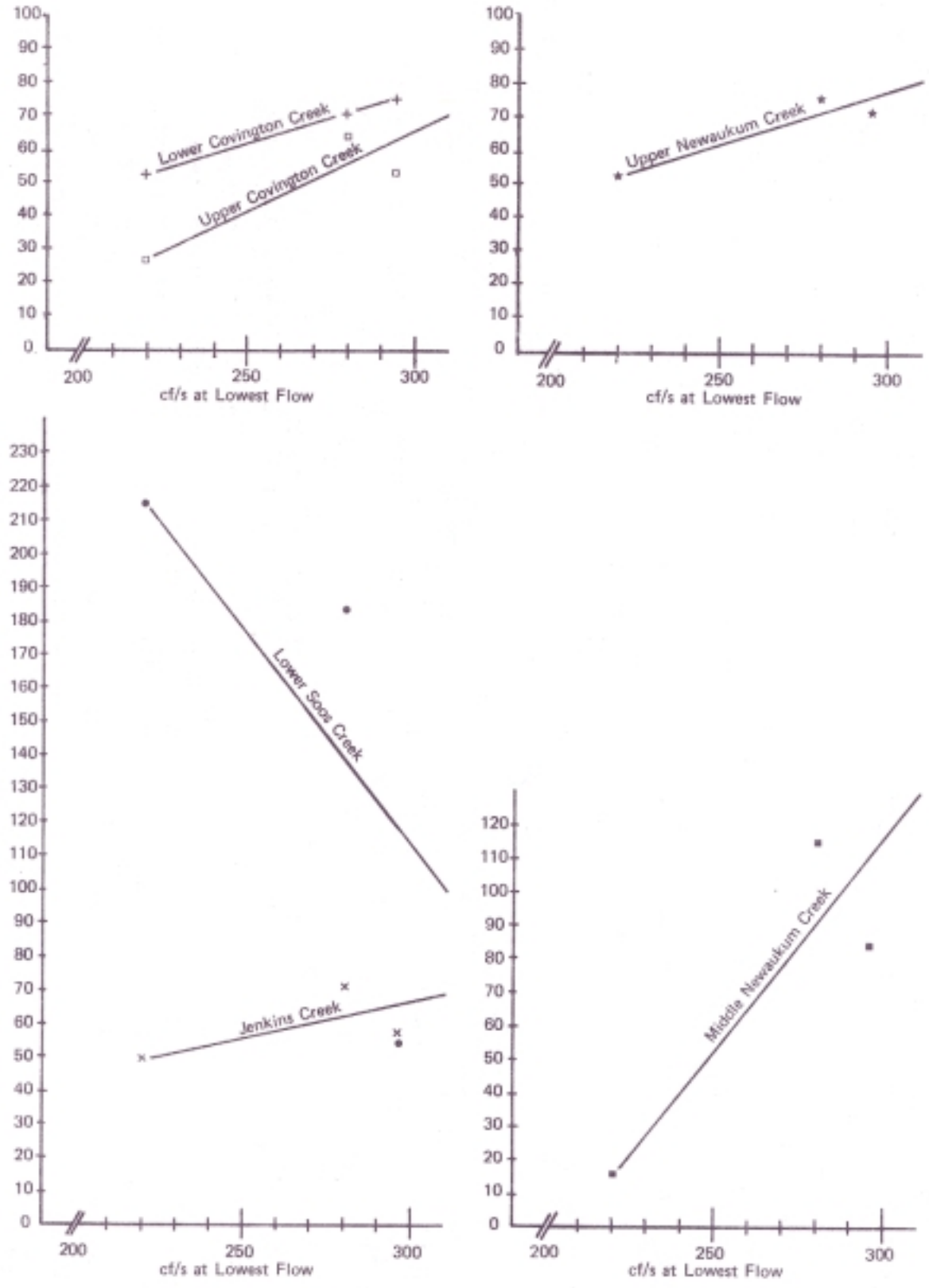


FIGURE 2. Steelhead Fry (age 0+) Abundance and Summer Low Flow in Green River Tributaries.

APPENDIX C

COMMENTS

The following are the letters of comment received on the Draft Supplemental Environment Impact Statement and program document. Corrections and additions have been made to the documents where we feel it is appropriate, while other comment responses have been provided in Appendix D.

Comments were received from the following:

February 29, 1980

Mr. Wilbur F. Hallauer, Director
State of Washington Dept. of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Attention: Mr. Henry Yates, Hearings Officer

Dear Mr. Hallauer:

Subject: Western Washington Instream Resources Protection Program
Green-Duwamish River Basin (WRIA09)

At the February 7, 1980 Public Hearing on the above subject, the Water Division of Tacoma's Department of Public Utilities was allowed to present a very brief synopsis of its concerns with the issue of setting low flows for the Green-Duwamish River. Because of the time constraints placed on oral presentations, we submitted a large volume of written testimony at that meeting for your consideration.

The Hearings Officer at that meeting declared that the record would remain open through the month of February for further comments. Since the time of the Public Hearing we have generated additional information and comments. At this time we wish to enter further information into the record and to ask questions which must be answered by the DOE to assure that all the implications of the Instream Protection Program for the Green-Duwamish River are clearly understood and dealt with prior to the adoption of the final administrative rules. A most basic consideration for the Water Division and other water purveyors in this complicated issue is the need for long-range planning in water supply development. We seek DOE's support and cooperation in planning for future municipal and industrial (M and I) water supplies.

Specific information and comment regarding the instream protection program as it relates to the Green-Duwamish River are attached. The attachments are divided into three sections as follows:

1. General questions and comments dealing with the implications of the program to the Green-Duwamish River, the operation of Hanson Dam, the out-of-stream uses, M and I water sources, etc.
2. Detailed comments are questions specific to the December, 1979 proposed rules and supplemental EIS.
3. A report by Charles Howard and Associates: “Green River Water Supply Capabilities” February 1980.

CITY OF TACOMA
Department of Pubic Utilities

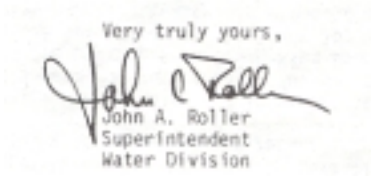
Mr. Wilbur F. Hallauer
Page Two
February 29, 1980

It should be pointed out that the report by Mr. Howard is, at the present time, incomplete in some sections. This is due to the additional time taken by Mr. Howard in further development and analysis of the data. The raw data are, however, included in the attached report. The conclusions will be forwarded for inclusion in the record when they are available in printed form. The report has already been under discussion with your staff and will be used as a source document for our jointly sponsored workshop. We have recently been informed by Mr. Howard that he has discovered a -misstatement in his testimony as presented at the Public Hearing. A letter of clarification is also attached for inclusion in the Public Hearing record.

As you will recall, a workshop on the development of an equitable low flow curve has been scheduled for March 10, 11 and 12, 1980 by your department and the Water Division. It is our understanding that materials and recommendations jointly developed at this meeting will be made part of the Public Hearing record and will form part of the basis for the final administrative rules and program documents.

We also wish to draw your attention to the point that we have consultants presently engaged in developing a Comprehensive Water Study Plan for the Water Division and writing an Environmental Impact Statement for that plan. The Plan describes present and future demands for M and I water in Pierce and South King Counties and evaluates alternative means to meet those demands . The EIS describes the impacts of the Plan and pays specific attention to the Pipeline No. 5 project. Although the results of these efforts are not yet in a form suitable for inclusion into the record of the Public Hearing, their contents should be considered by DOE in its deliberation on the low flow issue for the Green River.

We look for-ward to your comments on our testimony and to the workshop session mentioned above. I am sure that a timely resolution of the issues is in the best interests of all. If you have any questions on our presentations please do not hesitate to contact me or Ken Olson.



enc.
cc: Mr. John F. Spencer
Mr. Rod Sakrison

Charles Howard & Associates Ltd.
Professional Engineers

February 27, 1980

File: 7928-101

Tacoma Utilities
P.O. Box 11007
TACOMA, Washington 98411
U.S.A.

Attention: Mr. John Roller, P.E.
Superintendent
Water Division

Dear Mr. Roller,

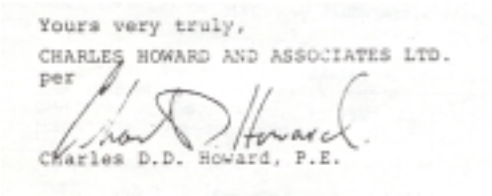
Re: Green River instream Flows
Presentation to Feb. 7, 1980 Public Hearing

During preparation of our forthcoming report to you on the Green River we have noted an incorrect statement in the submission read by myself to the above public hearing.

On page 2 of my statement, the last sentence of the fourth paragraph should be replaced by,

"The DOE proposal requires instream flows which exceed the natural runoff of the system more frequently than about every three years. Without additional storage the DOE proposal would cause instream flows to fall below those which have been historically maintained by the COE. This would occur every eight to ten years.

I would be grateful if you would draw this correction to the attention of the Department of Ecology and others who are interested in this submission. The correction does not invalidate any other statement or illustration which my firm and myself presented to the hearing nor does it influence our conclusions or recommendations.



CDDH/ap

528 St. James Street, Winnipeg, Canada R3G 3/4 Telephone (204) 786-6609

February 28, 1980

ATTACHMENT 1: GENERAL COMMENTS BY TACOMA'S WATER DIVISION ON WESTERN WASHINGTON INSTREAM RESOURCES PROTECTION PROGRAM GREEN-DUWAMISH BASIN

1. At the Public Hearing, DOE indicated that only instream uses were examined and that out-of-stream impacts were not addressed. This is a rather short-sighted position and is not in accordance with DOE's own rules. Why were some obviously significant economic and environmental impacts ignored?
2. At the Public Hearing, DOE indicated that the EIS coverage was light but that it did amplify on the programmatic EIS. Our analysis also showed the EIS to be lacking in depth on many critical issues. We note, however, that the programmatic EIS was not amplified on by the supplemental EIS. Are we correct in assuming that the final EIS will be expanded to adequately describe the total impacts of this proposal?
3. At the Public Hearing, we heard DOE say that in one-third of the years the proposed flows cannot be met by the natural stream. Is this true? If so, what are DOE's plans for meeting those flows in the future?
4. By setting low flows in the rivers on the basis of instream uses only, DOE appears to be ignoring Tacoma's need for future water for its present customers as well as potential future customers in South King County. How can DOE ignore the needs of the human population of the State for safe, adequate supplies of municipal water provided at a reasonable economic cost?
5. What will be the effect of this program on our 100 cfs water right permit application currently being processed by DOE?
6. What effect would this program have on water Tacoma might store for its own use during dry years?
7. What are the consequences of adopting a low flow curve at 150 cfs when the Corps of Engineers operates the dam to provide a minimum flow of 110 cfs? We have been led by DOE to believe that the 110 cfs figure would be used if the Corps felt it was unable to provide 150 cfs. If that is true we wonder what would happen if a court directed DOE and the Corps to provide the 150 cfs. Our analysis shows that during some dry years there may not be enough storage behind Hanson Dam to continuously provide for this flow. Who would be responsible for the costs of providing the increased storage necessary to cover this eventuality? What would be done for Tacoma in order to compensate it for the probable degradation in water quality caused by this increased storage?
8. What averaging period was used in determining low flows? Is the same averaging period used on the application of the rule curve? Is the 150 cfs an absolute minimum flow? What is the definition of the phrase "rule curve"?
9. In view of testimony provided at the Public Hearing by DSHS, Seattle Water, other water districts and ourselves on the limited availability of groundwater and the proposed restrictions on surface water for M and I uses, what provisions are provisions are proposed by the DOE to ensure an economic and adequate water source for the Puget Sound area as a mitigating measure for the adverse impacts of the proposed rules?

10. How will future requests for water right reservation be handled by the DOE in light of the low flows proposed as part of this program? Will additional storage have to be provided and by whom?
11. In meetings with DOE personnel we have been told that there would be flexibility in the interpretation of the rules. Does DOE intend to publish guidelines on how this flexibility operates with the final rules? If not, how are we to know how to operate our system?
12. In closing tributary streams for storage, did DOE consider how Tacoma and other water suppliers were going to accumulate enough water for projected future uses? If not, why not?
13. Tacoma has purchased Eagle Lake for possible future storage. What effect does closing the tributary streams for storage nave on Tacoma's plans for this lake or of storage sites located on Smay Creek, North Fork of the Green River and other tributaries in our municipal watershed?
14. By severely limiting future withdrawals from Green for M and I use, more dependence may be placed on groundwater sources. Did DOE examine the consequences of the proposed program as it relates to limited and apparently dwindling groundwater supplies? If not, why not?
15. Under the proposed rules, no water utility can divert surface water for a firm yield without providing storage in large quantities. Few, if any, utilities can afford such storage projects. In addition, such storage may not be in the best economic interests of the citizens of the State. This issue was not addressed adequately in the EIS. Why not?
16. Are there written procedures to be used by DOE in setting the low flows? That is to say, how is it decided who participates in the process, who calls the meetings, are the meetings open to the public, are records kept of deliberations, etc?
17. We are concerned with the methodology apparently used by DOE. Are these methodologies dictated by rules and/or regulations? If not, who decides which will be used? Were other methodologies considered? Which ones?
18. The fisheries data used in formulating the proposed rules are inadequate and unsubstantiated. Were other data examined? If so, why were they rejected?

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ATTACHMENT 2: DETAILED COMMENTS BY TACOMA'S WATER DIVISION ON WESTERN WASHINGTON INSTREAM RESOURCES PROTECTION PROGRAM GREEN- DUWAMISH RIVER BASIN.

1. Page ii , Paragraph 1, regarding summary. We have carefully examined Chapter 90.54 RCS (Water Resources Act of 1971) and have concluded that the proposed program does not meet the legislative intent of the Act. **48**
2. Page ii, Paragraph 1, regarding summary. The summary should reflect the point that this proposed program practically eliminates any future water appropriations for consumptive uses unless very expensive storage is available. **49**
3. Page ii, Paragraph 2, regarding summary. The existing conservation storage is designed to provide an absolute minimum of 110 cfs for the benefit of the fishery resource. If the flows presently provided are insufficient for instream resources, it should be pointed out the flows provided are essentially equal to the natural flows with no out-of-stream users. **50**
4. Page ii, Paragraph 3, regarding summary. When the dam is properly operated, the natural flow of the stream can be provided from August through November. Due to anticipated reservoir turbidity problem, Tacoma would be forced to protect its property rights if any other agency proposed permanent conservation storage at the dam. **51**
5. Page iii, regarding summary. We must continue to stress the flows proposed by DOE are above the natural stream flows. DOE readily admits the proposed flows cannot be provided without additional storage. We believe the regulation should say the rule curve will be broken and when it is broken, the natural flow will be available. Our primary concern continues to be having the capability to capture and store enough low turbidity water for our proposed Pipeline 5 for the critical months. **52**
6. Page 1, regarding Instream Flows. The 1971 Act provides that streams and rivers shall be retained with base flows necessary to preserve, not enhance. The report makes a statement that is not substantiated, as follows: minimum flows "...are flows that can be expected in the stream a relatively high percentage of the time " DOE's stream rating system is completely in conflict with the 1971 Act since out-of-stream uses were not considered. **53**
7. Page 2, regarding Basin Hydrology, Paragraph 3. Minimum stream flows occur between August and November, not July. July is traditionally a month with adequate flows **54**
8. Page 3, regarding Instream Resources, Paragraphs 1 and 2. It must be pointed out the 1971 Act calls for base flows for preservation, not enhancement, We believe the proposed program does not meet this criteria. We also point out that the instream rating system is a biased procedure without equal participation by out-of-stream interests and all instream users. **55**
9. Page 6, Paragraph 4, regarding fisheries. Flow releases may be insufficient for water quality purposes, but the flow is essentially equal to the natural river flow during the critical time of the year. **56**
10. Page 8, regarding water quality, Paragraph 5. Low natural "stream flows ... appear to be the cause of the temperature violations." Again, the stream receives essentially natural flows during these critical times and we feel this should be sufficient. **57**
11. Page 9, regarding water quality. If the 7-day/10-year recurrence low flow at Auburn is 107 cfs, then the proposed 300 cfs flow is excessive in our view. DOE fails to recognize that for urban uses, diverters must plan for the worst year and the standard should be set for the worst year. The proposed program is designed for some phantom water user who can adjust his diversion in good or bad years. **58**
12. Page 9, regarding Water Resources Development Plans. DOE points out that future users cannot divert every year unless they have storage. The economic cost of such a measure should be defined by DOE. It should be pointed out the dam provided for flood control and fishery conservation initially and that other secondary benefits such as water supply were to be available in the future. **59**
13. Page 10, regarding Howard Hanson Dam, Paragraph 3. A couple of sentences should be added as follows: Essentially, from either July 1 to November 1 or August I to December 1, the full natural flow of the river can be provided since the 25,649 acre feet of storage is equal to Tacoma's diversion over a four-month period. The river's hydrographs show that the natural flow of the river is essentially being provided by the present conservation storage during the critical months. The natural flow of the river for the months July through October from 1932-1962 was 372 cfs compared to 347 cfs provided below Tacoma's diversion from 1963-1978. The natural flow of the river for the months July through September from 1932-1962 was 290 cfs compared to 295 cfs provided below Tacoma's diversion from 1963-1978. These data show that the present storage is compensating the river for Tacoma's 112 fs diversion and the river is essentially receiving the natural flow during the critical months **60**
14. Page 10, regarding Howard Hanson Dam, Paragraph 4, should read: "When inflow into the reservoir is unable to supply Tacoma's 112 cfs, the instream resources below Tacoma's diversion could receive less than the full minimum flow ..." **61**
15. Page 10 regarding Howard Hanson Dam, Table 2. The table should be revised as follows to show the inconsistencies in this table.

Table 2. List of Minimum Discharges from Howard A. Hanson Dam and Palmer Gage.

DATE	FLOW AT DAM*	FLOW AT PALMER GAGE
November 3, 1965	194 cfs	252 cfs
September 2, 30, 1967	208 cfs	128, 109 cfs
October 9, 10, 11, 1967	204 cfs	116, 118, 151 cfs
September 10, 11, 12, 13, 1967	139 cfs	123, 125, 125, 123 cfs
August 5, 6, 29, 30, 31, Sept. 1, 1970	188 cfs	100, 110, 107, 107. 105 c,
October 2, 3, 4, 5, 1970	220 cfs	136, 134, 136, 157 cfs
October 13, 1971	215 cfs	958 cfs
June 8, 9, 1972	202 cfs	1,380, 2,380 cfs
September 29, 1974	210 cfs	220 cfs
November 1, 2, 3, 4, 5, 6, 1974	124 cfs	103, 22, 21, 20, 20, 29 c

*Flow near Palmer corresponding to the above dates would normally approximate the figures, above plus local inflows less the 112 cfs diverted by Tacoma.

16. Page 10 regarding Howard A. Hanson Dam, Paragraph 5. The last sentence should be revised as follows: **62**

    Evacuation of the reservoir, which sometimes occurs in early October, can dramatically raise flows for a short period, often to be followed by continued dry conditions if a flood doesn't materialize as predicted.

17. Page 11 regarding City of Tacoma Diversion, Paragraph 1. The paragraph should be revised to reflect actual conditions. **63**

    Tacoma's withdrawal of 112 cfs is usually from the Green River; however, the water from the well field is used at times either in place of the Green River water, or in combination with it.

18. Page 16, regarding Minimum and Instream Flows or Levels. Again, we have carefully read the 1971 Act and this program clearly doesn't meet the legislative intent. No attempt is made to balance instream and out-of- stream uses particularly on an economic and environmental basis. **64**

19. Page 21, regarding Determination of Instream Flows. We believe the hydrological methodology developed by DOE is inadequate. Any future firm flow diversions will always be limited to those users that acquire a sufficient amount of stored water to meet needs. Perhaps, instream users should share equally in this burden. **65**

20. Page 23, regarding Stream Rating. We believe the rating scheme is a direct violation of the 1971 Act since out-of-stream values were not considered. Since the Dept. of Fisheries is run for commercial purposes, we can see no reason why their input and concerns should be given any more merit than out-of-stream users. **66**

21. Page 24, regarding Percent Flow Duration. It should be pointed out an exceedence level of 63 percent means that 6.3 years out of 10 years the river flow is expected to be higher while 3.7 years out of 10 years the river flow is expected to be lower. **67**

22. Page 24, Management of Instream Flows. It is claimed that "In establishing instream flows, the DOE is identifying instream resource protection levels not currently available due to the existing operation of Howard A. Hanson Dam." It should be pointed out that flows recommended by DOE would not be present under natural conditions either. It should also be pointed out that with only 26,000 acre feet of storage, the flows proposed by DOE cannot be obtained. **68**

23. Did the flow setting method used by DOE include the fact that the Palmer gage was above the City's diversion from 1932-1961 and below the City's diversion since 1962? **69**

24. Page 26, Management of Instream Flows, Paragraph 1. A sentence should be added as follows to show full disclosure of the future river condition: If a future diverter wishes to use water continuously, it will not be possible without providing storage.

ATTACHMENT 2

25. Page 26, Management of Instream Flows, Paragraph 2. In our view, the normal year curve should be used about 6 out of 10 years, the so-called critical year curve should be used about 3 out of 10-years, and for 1 out of 10 years the flow will fall below the so-called critical year flow. **70**

26. Page 26, Paragraph 3. A two-step pattern of release from storage based on an operating formula makes more sense to us for the management of the stream compared to the administrative method proposed. When a drought is under way the release pattern from storage would change. (See Howard report for details.) Even the critical year flow enhances rather than preserves instream resources. **71**

27. Appendix A, Page 3, Establishment of Instream Flows. Since DOE readily admits that about 4 years out of 10 these flows cannot be provided we propose a change in the rule to fully disclose this condition. Three options are proposed as follows:

    1. Flows near Palmer would follow a rule curve with a lower limit of 110 cfs which is nearer the true natural river flow. No future diverter could use the stream at Palmer without providing storage for August through November requirements.
    2. Natural flow of the river would be required from either July through October or August through November at Palmer.
    3. In all cases, the natural flow of the river shall be the minimum flow at Palmer whenever the natural flow falls below the minimum values proposed by DOE. An absolute minimum of 110 cfs at Palmer shall be provided.

    We think all of the options listed above better reflect and more fully disclose the future condition on the river.

28. Supplemental EIS. The EIS is grossly inadequate. It does not adequately describe the out-of-stream effects nor does it adequately describe the instream effects. It does not note that the Fisheries Department is set up for commercial purposes and by its very nature shouldn't merit any extra consideration over out-of-stream users. The ultimate environmental and economic impact on municipal and industrial water customers (the people of our State) is simply ignored. **72**

29. Supplemental EIS, Page 1. Since it is uncertain how this proposal will affect the City's proposed Pipeline No. 5, the statement is inadequate. Adverse environmental and economic impacts are foreseen for out-of-stream users and these must be adequately described before the EIS is satisfactory. **73**

30. Supplemental EIS, Page 2, General, Paragraph 2. It should be noted these particular goals are achieved at the expense of out-of-stream users. **74**

31. Supplemental EIS, Page 2, Paragraph 3. Again, the human economic and natural environment will be adversely impacted by this proposal and the impacts and effects have not been quantified.

32. Supplemental EIS, Page 3, Paragraph 1. Sentence 1 should be changed as follows: The proposal will not directly affect present flows in the river, but future flows will be affected. **75**

33. Supplemental EIS, Page 3, Paragraph 21. The paragraph should be changed as follows: In the first case, the operation of the dam would have to be altered in order to implement the proposed instream flows and increased storage would be necessary. Additional municipal water supply would necessitate increasing the storage and altering the operation of Howard A. Hanson Dam. **76**

34. Supplemental EIS, Page 3, Municipal Water Supply. Water is diverted several miles downstream of the Howard A. Hanson Dam. Before 1978, Tacoma used water stored in its reservoirs and local well water until the river cleared. The City installed the North Fork wells to assure a constant and adequate supply of better quality water.

35. Supplemental EIS, Page 4, Municipal Water Supply, Paragraph 1. Sentences should be added before the last sentence as follows: The Corps made this commitment to Tacoma as a condition of building the dam. That is they assured Tacoma the dam would not significantly affect water quality. **77**

36. Supplemental EIS, Page 4, Municipal Water Supply, Paragraph 3. Tacoma thinks the Pipeline 5 project can be successfully completed without the need for a filtration plant. **78**

37. Supplemental EIS, Page 4, Municipal Water Supply, Paragraph 5. The DOE proposal may require changes in the operation of Hanson Dam. These changes would probably create the need for Tacoma to filter the water from its diversion at a significant cost. Tacoma would have to recover this cost somehow, perhaps from DOE. It should be noted the City owns the land that the 69,000 acre feet would cover and the City may be reluctant to grant permanent storage rights over those lands. **79**

38. Supplemental EIS, Page 5, Municipal Water Supply, Paragraph 1. Storage would have to be monitored much more closely than at present.

39. Supplemental EIS, Page 5, Municipal Water Supply, Paragraph 2. It should be noted that the critical water year is hard to predict until the drought is well underway. It should be noted that so-called "normal years" occur about 6 out of 10 years and "critical years" occur about 4 out of 10 years, according to our analyses. We still think natural flows should be adequate for the fishery. **80**

40. Supplemental EIS, Page 8, Fishery Resource, Paragraph 1. After reviewing Paragraph 1, we cannot understand how a flow can even be suggested due to the state-of-the-art. The natural flow at Palmer should be sufficient for fisheries purposes.

41. Supplemental EIS, Fishery Resource, Paragraph 6. Apparently, professional judgment is the best tool available because of the complex interrelationships and lack of overall knowledge on stream flows for fish. We think more factual information needs to be provided. **81**

42. Supplemental EIS, Page 9, Economics. The EIS should address adequately the possibility of a filtration plant and the resultant cost to either the City, the Corps, or DOE. It is doubtful that DOE flows will be altered once the regulation is set. **82** If we do not know the economic answers to instream versus out-of-stream uses, then we should not tamper with the present natural flows provided at Palmer.

ATTACHMENT 2

43. Supplemental EIS, Page 9, Unavoidable Adverse Impacts. Again, the adverse impacts on out-of-stream users should be quantified. **83**

44. General Comment. The report should show what happens in a low flow average flow and above average flow year as a result of the imposition of the proposed rules. It should also address the operation of Hanson Dam and the issue of who will pay for the cost of the increased storage. With respect to increased storage, the EIS must address the probable impacts on Tacoma's water quality. **84**

February 28, 1980

Hearing Officer
Department of Ecology
Olympia, WA. 98504

RE: Green Duwamish River Basin Instream Resources Protection Program

Dear Sir:

The Muckleshoot Indian Tribe appreciates the opportunity to comment on the Green Duwamish River Basin Instream Resources Protection Program. The following written comments summarize the testimony presented at the public hearing February 7, 1980, and are primarily addressed to flow recommendations for the Green River which is an important spawning area for native salmon and steelhead.

The Tribe supports the establishment of minimum flows to protect instream needs. By this support, however, the Tribe in no way waives the rights it otherwise has to sufficient flow for its fishery resource. **85**

Tribal staff are concerned that the proposed flows represent a compromise between competing instream and out-of-stream uses. RCW 90.54 imposes a clear duty on DOE to establish base flows protecting the fish resource. RCW 90.54.020 (3)(a) reads in part:

> Perennial rivers and streams of the state
> shall be retained with base flows necessary
> to provide for preservation of wildlife fish …
> and other environmental values.

Nothing in this statute indicates that out-of-stream needs are to be even considered in the establishment of base flows. Aside from this statutory duty, the state has an obligation under the Treaty of Point Elliot to protect the Green from appropriation by its citizens which would adversely affect the fishery resource. **86**

MUCKLESHOOT INDIAN TRIBE
39015 172ND AVENUE S.E. - AUBURN, WASHINGTON 98002 - (206) 939-331

In that treaty the ancestors of Muckleshoot Indian Tribe reserved a right to take fish in the Green River. That right includes and indeed would be meaningless without a reservation of sufficient water for the fishery. This tribal right has been used and dates from time immemorial. As a federally protected right pre-dating the formation of the state it preempts any right subsequently granted under state law. **87**

Tribal staff have reviewed the Draft Proposal for the Green. It sets a minimum flow of 550 cfs dropping to 300 cfs. It is our understanding that in 1977 WDF determined that the optimal level for spawning in the Green is 800 cfs at Auburn, and that a rearing flow of at least 300 cfs is required. We have not independently evaluated WDF's preferred spawning and rearing figures and therefore are unable to say with certainty whether they provide sufficient flow. But based on that study we believe nothing less than a spawning flow of 800 cfs and rearing flow of 300 cfs is acceptable. Anything less even 5 or 10% is a taking of the Tribe's fish. **88**

Further observations by the Tribe's biologists indicate that water levels need to be maintained at least to mid July when steelhead are released from the gravel and should begin to rise from rearing flows by September 1 when chinook spawning begins. **89**

We realize that presents flows in summer are not sufficient to meet these requirements. We note, however, that the authorized purposes of Howard Hansen dam are flood protection and conservation. We therefore believe that any waters which may become available through a change in operation of Howard Hansen Dam should be applied first to meeting in stream fishery needs. **90**

Sincerely,

Richard Reich
Tribal Attorney

cc: Marie Starr
Rod Sakrison

washington state association of water districts
suite 112 1818 westlake north seattle, washington 98109 284-5820

February 15, 1980

Dept. of Ecology
Olympia, Washington 98504

Attn: Henry Yates

RE: Proposed WAC Chapter 173-509
Instream Resources Protection Program
Green-Duwamish River Basin,
Water Resources Inventory

Dear Mr. Yates:

This letter is to request reevaluation of the above proposed regulations and adequate extension of the hearings procedures to insure that the health and welfare of the domestic water user is protected. This association represents some 600,000 customers statewide and is seriously concerned with the proposed regulations that will establish minimum stream flow on the Green River as well as regulations for other rivers throughout the state. These regulations not only establish controls on the river, but provide for severely restricting groundwater withdrawal. **91**

The rivers of the state have been a principal source of water supply for a large segment of the state's population. The prevention of withdrawal of reasonable amounts of water from the rivers will severely impact these communities. Alternate sources of supply have not been established and the cost of developing possible alternative sources could have a severe economic impact on the water districts and their customers. **92**

There is a recognized need to balance the instream and out of stream uses so that the entire public can utilize the river to the greatest extent possible. The members of the Association appreciate the recreational and aesthetic values of the river. However, an adequate and safe public water supply is essential for the continued existence of our communities and has to remain our first priority.

The procedure used to develop the proposed minimum stream flows does not appear to meet the intent of state law. RCW 90.54.020 includes a long list of fundamentals for utilization and management of waters of the state. The need to provide an adequate and safe supply for public consumption is one of the major fundamentals in this list. The wants of the Department of Fisheries appear to be the only major concern used in the development of the regulations. **93**

The data used for justification of the proposed flows were apparently developed after a minimum amount of study. These studies provide an indication that the low river flows may impact the fish production. There are many other factors that affect fish production. All elements relating to fish production should be carefully analyzed before such high minimum flows can be justified. **94**

washington state association of water districts
suite 112 1818 westlake north seattle, washington 98109 284-5820

Minimum river flows have been controlled by the Howard A. Hanson Dam at 110 cfs. The flow has been significantly above that value most of the time. Stream flow records prior to construction of the dam indicate several flows below 110 cfs. Establishment of flow significantly above the historical flows is not appropriate. **95**

The EIS does not evaluate the adverse impacts that the proposed regulations would have on all elements of the environment. There is little comment, if any, concerning the impacts on public water supplies. The actual impacts of an alternative of establishment of lower flows should also be analyzed. The lack of proper evaluation of these adverse impacts is a clear violation of our understanding of the intent of the state Environmental Protection Act. There is not enough data available to make a reasonable decision on the proposed regulation. **96**

The proposed regulation will permit the Department of Ecology, in effect, to cut off a municipal water supply should the flow in the river fall below the "normal year". The elimination of a public water supply will have a very serious negative impact on the public. Definite criteria needs to be established as to when and how the Department of Ecology can exercise this authority. **97**

The proposed regulations that will permit the Department of Ecology to withhold water rights for groundwater withdrawal will cause several of the Association members serious problems. Future expansion of groundwater is critical to many districts in meeting the needs of the public. These needs cannot be controlled by the water purveyor. It would be extremely difficult in most cases to make a determination as to whether withdrawal of groundwater actually has an impact on the flow of the stream or not. Criteria needs to be established to indicate how this provision is to be administered. **98**

We request that the Department of Ecology reevaluate the proposed regulations to consider all the fundamentals established in RCW 90.54. Water supply for public consumption is essential to the continued wellbeing of the citizens of the State of Washington and has to receive first priority in order to protect their health and welfare. We therefore request the continuance of the present minimum flow of 110 cfs. **99**

Sincerely yours,

Henry F. McCullough
W.S.A.W.D. President

Helene Smith
W.S.A.W.D. Executive Director

cc: W.S.A.W.D. Membership
Kenneth M. Lowthian, Supt. Seattle Water Dept.
John A. Roller, Superintendent of Water, City of Tacoma
Robert Leever, P.E., Supervising Engineer, Water Supply & Waste Section, DSHS

METRO
Municipality of Metropolitan Seattle
Exchange Bldg. • 821 Second Ave., Seattle, Washington 98104

FEB 25 9 22 AM '80

February 25, 1980

Mr. John Spencer
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Dear Mr. Spencer:

Draft Environmental Impact Statement Green/Duwamish River Basin Instream Resources Protection Program

Metro staff has reviewed this proposal and offers the following comments for your consideration.

First, we would like to express our support for the Department of Ecology's efforts to establish minimum flow criteria for the Green/Duwamish River Basin.

As you know, Metro, as the designated areawide water quality planning agency for the Cedar and Green River Basins in King County, is committed to assist in the protection of instream resources in the Green/Duwamish River Basin.

In 1974, Metro, along with other agencies, managed the comprehensive RIBCO study of the Green/Duwamish River which eventually evolved into the State's 303(e) Plan for the Basin. This plan identified the need for low flow augmentation of the lower Green River between Auburn and Renton during summer and early fall so that temperature and dissolved oxygen water quality standards related to the fishable, swimmable goals of the Clean Water Act could be achieved. **100**

The study suggested that the low flow augmentation could be met by a different management scheme for the Howard Hanson Dam as regulated by the U.S. Army Corps of Engineers than that currently utilized. The study

also suggested that trees could be planted along the river to provide shading which would also help mitigate the temperature problems occurring in the lower Green. **101**

Additionally, the RIBCO study evaluated the Green River flow levels that would be necessary to achieve DOE water quality standards. Utilizing modeling techniques the study suggested that flows of approximately 550 cfs at Auburn would be necessary to achieve these standards during the summer low flow period. **102**

We are pleased that the Department of Ecology is proposing to increase the minimum flow at Auburn to 300 cfs. We believe that this action would help mitigate the adverse temperature and dissolved oxygen problems the water course is currently and predicted to experience. However, it should be noted that the 300 cfs low flow does not appear to be sufficient to meet DOE's adopted water quality standards. **103**

We believe that the establishment of approximately 550 cfs at Auburn would mitigate the aforementioned problems of meeting the water quality standards for the lower Green. The RIBCO studies indicate that the 550 cfs could be met by further modification of the operations of Howard Hanson Dam. Additionally, flows to the Green River would benefit the Duwamish River's water quality primarily by dilution and by forcing the salt water wedge to become positioned closed to Elliott Bay. The salt water wedge has been a source of the low dissolved oxygen problems in the Duwamish River. **104** **105** **106**

DOE has stated, and Metro agrees, that the dilution of effluent from the Renton treatment plant is not an instream use which justifies increased flow augmentation. The justification for increased instream flows has been outlined above and is not related to the Renton treatment plant. **107**

It should be noted, however, that increased flows would act to further enhance dilution and, thus, will minimize adverse impacts on the River.

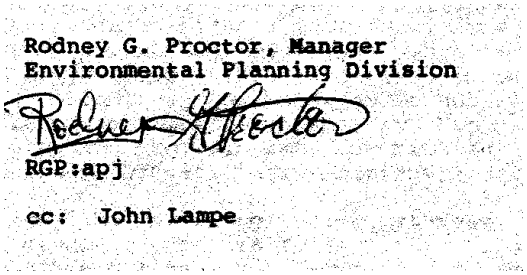
Metro is currently in the process of developing long-range plans for the Renton system as part of the Renton 201 study. Long-term alternatives being considered include advanced waste water treatment to eliminate constituents in the effluent which may be adversely impacting water quality. Other alternatives being considered include several options which divert effluent out of the River. The low flow requirement established by DOE is not expected to affect the ultimate long-term decision Metro makes, however, the timing of Metro's decisions may be affected by DOE's program. **108**

Finally, Metro staff appreciates the continued efforts of the DOE to work with Metro in developing measures to improve water quality in King County. We would be pleased to share our detailed modeling information with you and would be prepared to assist in any re-evaluation of the water quality standards. **109**

Should you require assistance in further evaluation of this proposal, please contact Mr. John Lampe, Manager of Water Quality Planning Division at 447-6591.

Thank you for the opportunity to review and comment.

Very truly yours,



Seattle Water Department

Kenneth W Lowthian. Superintendent
Charles Royer, Mayor

February 27, 1980

Mr. Wilbur G. Hallauer
Department of Ecology
St. Martin's College
Olympia, WA 98504

RE: Comments on Instream Resources Protection Program and
DEIS for the Green-Duwamish River Basin

Dear Mr. Hallauer:

Thank you for the opportunity to review and comment upon the you have presented for the setting of instream flows in the Green-Duwamish River Basin. Since we are the regional water supplier for the Seattle Metropolitan Area and share with the City of Tacoma the public obligation to provide water service to King and Pierce Counties, we are concerned that your proposed action may have very serious regional impacts.

It is our opinion that the package you have provided does little to support or justify your proposed action. We continue to strongly disagree with your methodology, your interpretation of the Water Resource Act of 1971, and your presentation of EIS material.

The methodology employed by your department to determine the Instream Flow values for the proposed regulation is not appropriate for use in a river system as complex as the Green-Duwamish. It does not adequately consider the actual needs of the fishery resource nor does it consider other uses of the water, particularly out-of-stream use. Nowhere throughout the information and material provided were we able find any reference or indication to e determined based on spawnable area available in the stream. We find this somewhat surprising since the spawnable area parameter was the prime issue presented in the EIS material for Instream Flow Protection Programs for both the Snohomish River and Cedar River Basins. **110** **111**

In your DEIS, you indicate that although relationships between flow and available spawning area exist, they are not well enough defined and instead you rely on professional judgment of fish biologists. From the material in the EIS and in particular the references cited, it appears that only State Fish Biologists were involved. There is no evidence that fish experts from outside of the state organizations were consulted. **112**

The Basin EIS and its supplemental material is totally inadequate and does not conform with the guidelines of SEPA (particularly WAC 197-10-425 (4)). Although this should be a decision-making document, it appears the decision has already been made. No reasonable discussion is made of alternative actions and resulting impacts. There is insufficient information throughout the document upon which to reasonably base any decision. **113**

We strongly disagree with your statements on Page Two of the DEIS in which you indicate that the proposal will not lead to adverse environmental impacts because the proposed action is to not divert. The "environment" you refer to is apparently limited to instream surroundings and does not conform to the SEPA "List of Elements of the Environment" (WAC 197-10-444), which specifically includes public water supplies. Water utilities and other out-of-stream users, with the Department of Ecology's knowledge, over the past twenty to thirty years planned to divert water for expected future growth from certain rivers in the area. The planning and financing process for such major facilities are expensive and quite time consuming. The instream flows you propose could cause drastic changes in the amount and location of water that has previously been assumed available for M & I supply. There will be substantial financial and economic impacts not only on the major water utilities of the area, but on the general population as a whole. This can affect growth patterns, interties with other utilities, and can impact adjacent regional water suppliers (such as us) causing them to abruptly change their plans. Nowhere in your document is there any discussion of the nature and extent of these impacts. **114**

On Page 21 of your Program Document, you indicate that a number of water rights are currently pending in this basin. Your DEIS material indicates that there are "no adverse impacts'. Obviously, if instream flows are set at too high a level, some of these water right applications may be denied. This has obvious and substantial regional impacts that must be addressed. **115**

We therefore urge DOE to exercise the option offered under the WAC 197-10-440 (13) (C) and undertake a discussion concerning relationship between the costs of the unavoidable adverse environmental impact, i.e. loss of potential water and power supplies and the expected beneficial environmental impacts which will result from the implementation of the proposed action. DOE should also discuss in detail whether this proposal will have any long-range effects on the economic growth potential of the region. **116**

The Water Resources Act of 1971 provides a number of guidelines and directives to be followed by your department. Section 90.54.020 (1) RCW lists the various uses of water that have been declared to be beneficial under this Act. Among these are fish and wildlife values. Section 90.54-020 (2) RCW states that the allocation of water among potential uses and users should be based on the securing of maximum net benefits for the people of this State. Sub-section 3 of this same chapter refers to the preservation of instream flow values while sub-section 4 indicates that adequate and safe supply of water shall be preserved and protected for human domestic needs. All four of these sub-sections have equal weight. Nowhere in this Act is there any indication that any of the uses or users are considered from the start to have priority over any of the others. **117**

We could find nowhere in your EIS material any definition of “preservation”. The stated purpose of the Instream Flow Regulations is to "protect and preserve" the fisheries and other instream uses, yet there is no definition as to the intended level of preservation or the distinction between preservation and enhancement. **118**

In summary, you are proposing flows for the protection of instream values based on a method involving only concensus and negotiation admittedly without information as to the relationship of the flows to the Instream Values. You do not know the value of the resources that you are about to protect nor do you have a clear definition of what protection really is. You do not address the effects of your action upon the total environment (including the general population) and you have totally ignored the complexity of the multi-purpose uses of the Green-Duwamish River system now and in the future.

We strongly urge your Department to delay action on the setting of instream flows in the Green-Duwamish River until such time as the above-mentioned inadequacies and omissions have been resolved and a thorough basin study can be completed.

Sincerely,

KENNETH M. LONTHIAN
Superintendent of Water

KML:wmd

119

Bryan Phinney, President
Puyallup Chapter NW
Steelheaders
P.O. Box 77
McMillin, WA 98352

February 21, 1980

Mr. Rod Sakrison
Wash. State Dept. of Ecology
Olympia, WA 98504

Gentlemen:

This letter in response to the State Water Program, Green Duwamish River Basin Instream Resources Protection Program (area 9) and the Puyallup River Basin Program (area 10).

We realize this letter will be late but we wish to go on record, if possible, and make it known that we wish to be included in further public participation in both River basin programs in the future.

First a basic summary of water resources in general. We realize many mistakes in management have been committed in the past and many can never be economically corrected (Channalization for example). We also realize the need of people, agriculture, and community in our river basins and that the perfect solution to a fisheries problem may not be best for the community as a whole. We also realize the recreation potential of the rivers, Green & Puyallup, when one considers the closeness of the rivers to major population center coupled with the cost and availability of energy, i.e. gasoline.

Now to consider the Puyallup River Basin:

White River flows, we have never found the 25 CFS minimum flow to be acceptable below the Lake Tapps diversion. Possible solution would be to utilize Mud Mt. as a storage facility to provide an increase flow during the low flow periods.

We have noted from past till now the almost total extinction of the White River Spring Chinook and we feel this 25 CPS flow most likely had a great deal to do with their lose.

2) Puyallup River at the electron flum the 400 CFS during a major portion of the low flow period reduces this 11 miles of river to an almost dry stream bed or at best a trickle. This area has in the past provided many Native Steelhead to the Puyallup System but, alas, no more. A minimum flow through this region would be most beneficial.

3) Gravel removal: The river is currently under flood control management by Inter County. Their haphazard gravel removal program is, we feel, detrimental to the fisheries production of the river.

In many cases after the gravel has been removed the area has the appearance of a battle field with holes in the bar, a one to three foot berm along the river edge and lack of a proper grade from dike to water edge. (We have photographs.)

We have been unable to locate, thus far, any proper permits for gravel removal; however, they may exist.

A proposed-administration status:

We would ideally favor the establishment of a basin plan but would more than welcome a combination of "B" and "C" a partial closure coupled with a moratorium on any further building within the floodplain.

We would accept this combination for the following reasons. A savings In tax dollars (flood insurance and flood protection programs) and a protection during low flow in those all so important and productive small streams feeding into the Puyallup.

Concerning the Green:

A minimum flow must be established and maintained for obvious reasons.

A further dewatering by Tacoma should be accompanied by the requirement of a treatment plant and a better utilization of the storage facility behind Howard Hanson. **120** **121**

Again protection must be given to the Tributary streams.

And again no construction should be allowed in these areas that become flooded during periods of high flow. This land can be better utilized for agriculture purposes.

Thank you for the opportunity to respond even if it is late. I found the two booklets to be very well thought out and informative.

Please send any further information to the following addresses:

Bryan Phinney
P.O. Box 77
McMillin, WA 98352

Edward Santos
14803 Rainier
Sumner, WA 98390

Sincerely,

Bryan Phinney, Presidant
Puyallup Chapter
Northwest Steelhead & Salmon Council

STATE OF
Washington

DEPARTMENT OF FISHERIES
115 General Administration Building, Olympia Washington 98504 206 753-6000

March 3, 1980

John F. Spencer, Assistant Director
Office of Water Programs
Department of Ecology
Olympia, Washington 98504

Attention Hearing Officer

Gentlemen:

The following comments are offered on the Green - Duwamish River Basin Instream Resources Protection Programs, and supplement our statement made at the February 7, 1980, Public Hearing at Auburn, Washington.

Instream Resources, Fisheries

Page 4, paragraph 2. Your second sentence reads "chum salmon were once abundant but have not been reported in recent years." This should be a reference to pink salmon, which were historically produced in the basin but no longer occur. Chum runs have declined, but a viable native population remains and is now being augmented by an enhancement program by the Muckleshoot Tribe. **122**

Page 4, paragraph 4. It is implied that coho production is limited to the several tributaries listed. While they include the more important streams, it would be more accurate to ascribe coho usage to all accessible areas of the basin, with heaviest spawning in tributaries and utilization of all suitable areas for rearing throughout the year. **123**

Page 4. Paragraph 5. It is probably doubtful that chums once spawned throughout the basin, but more likely utilized accessible areas of mainstem as well as lower reaches of tributaries. Present production includes sections of the mainstem and two or three tributary streams. **124**

Page 4, paragraph 6. In addition to being a transition zone, the lower Duwamish River also serves as a rearing area for juvenile salmonids. This value may become seasonally limited where water quality is a problem. **125**

Page 6, paragraphs 2 & 3. The present Department of Fisheries artificial production is more accurately described in the draft Supplemental Environmental Impact Statement (page 7). You may also wish to incorporate here some of the recent harvest data from the EIS section. **126**

Management of Instream Flows

Page 24, paragraph :5. The reauthorization study of Howard A. Hanson Dam by the Corps of Engineers should not consider the DOE regulation as describing the ultimate attainable flows to benefit fisheries resources. Our statement at your Public Hearing on February 7, 1980, described dissatisfaction with the timing proposal for increased flows during fall months. While we recognize the limitations on flow regulation with the existing conservation pool, reauthorization with a different flow regime during the September - October time period could greatly benefit chinook salmon production. The timing for increase in fall flows that we recommend, which has yet to be incorporated into the proposed regulation, would come at the latest possible date to improve chinook spawning conditions. Benefit from an even earlier seasonal increase in flow can be readily demonstrated. **127**

Draft Supplemental EIS

Page 3, paragraph 1. Your statement reads, "The proposed regulation would represent the state's position in this study," when referring to the Corps of Engineers reauthorization study. For the reasons given in the previous paragraph, we oppose this statement. **128**

The Green-Duwamish instream protection program will provide many benefits to the state, and we appreciate the opportunity to participate and comment on your draft document.

Sincerely,

William Ruckelshaus
Gordon Sandison
Director

Washington Kayak Club
and Paddle Trails Canoe Club
Seattle, Washington
February 27, 1980

Department of Ecology
Instream Flow Program
Green Duwamish River
Olympia, WA 98504

Gentlemen:

Our respective boating clubs, representing over 1000 members, appreciate the opportunity to present a statement for inclusion in the hearing record on the proposed instream flow requirements for the Green-Duwamish River.

We regard the Green River from the Tacoma headworks diversion to the city of Auburn as a recreational resource of high statewide significance, especially for boating (kayaks, driftboat, rafts) and fishing. This section of the Green River possesses outstanding scenic qualities both near shore and the timbered upland. Further the river itself contains a wide variety of boating waters ranging from easy (used for beginning boater training) to very difficult.

These attributes of the river and its proximity to a large urban center have attracted large numbers of boaters for the last three decades--the first trips down the Green were in the early 50s. With current programs to reduce driving, the Green's location in the center of the state's greatest population concentration will mean even greater usage as more distant rivers become too expensive to reach.

One of the problems boaters have always faced in the past has been low water flows and the short season for boating. The normal boating season, when water flows are sufficient, are from March 1 to about June 15. Below are listed four favorite runs of the upper part of the river. Also included are the minimum and optimum flow requirements based on stream flow below Howard Hansen Dam (stat. 12105900). **129**

Run	River Section	Minimum Boatable Flow	Preferred Flow
Upper Green	Tacoma Headworks to Palmer at Fish Hatchery	500-650	650-1500
Upper Gorge	Palmer to Franklin Bridge	700-800	800-1500
Lower Gorge	Franklin Bridge to Flaming Geyser Park	450-550	550-1500
Yo-Yo Run	Flaming Geyser Park to second bridge downstream from park	400-500	500-1500

The above flows needed for recreational floating, as stated previously, are only available for short periods during the spring and occasionally in the late fall of the year. These flows are never available during the summer which is the prime boating season. **130**

We would like to suggest the following river flow regimes which would alleviate this situation should re-authorization of Howard Hansen storage and water release policies take place.

Options	Remarks
1. Weekend recreational release	During one day of six week-ends from the period July 15 to September 15, release an additional 29 ac-ft per hour (350 CFS) above the EIS proposed low flow of 150 CFS for 4-6 hours. This augmented release would have to be reduced at not more than 100 CFS/hour in order to reduce fish fingerling stranding. Such a release would give boaters time to complete their trips before low water again prevailed. Such releases would only require one to five percent of the total storage capacity of the reservoir depending on what flow regime was selected. **131**
2. Release higher flows earlier in the fall	Release about 500 CFS beginning about September 1 This request would be consistent with fisheries needs as well. **132**
3. More stable releases during prime boating season	From March 1 to June 15 release 500-2000 CFS and eliminate high flow releases in excess of 2000 CFS as much as practical. **133**

In order to achieve these optimum flows for boating and fisheries, we believe there are some viable alternatives that need to be considered in deciding use of water from the Green watershed. **134**

1. Curtail further diversions on side streams to the Green and from the main stem of the river.
2. Develop additional ground water sources in or adjacent to the water use area i.e. around Tacoma and South King County. **135**
3. Improve the current water supply system by installing water filtration and storage systems that would eliminate the need to spill large amounts of water from the Green storage facilities. Further, eliminating the spilling of large amounts of water into the Puyallup system would reduce the amount of Green River water diverted. **136**
4. Re-authorize control for water storage and releases on Howard Hansen Dam. The objectives of this re-authorization should be to A. augment the current miserly low flows to maximize the fishing and boating potential of the river, B. include in the calculations setting the amount and duration of the augmentation the amount of water needed for sewage waste dilution and flushing of the river below the Renton Metro plant. (We would like to point out that all of these functions, fisheries enhancement, boating use and waste dilution all utilize the same water--truely multiple use.) **137**

Thank you for your consideration of these requests.

Tom Steinburn

Tom Steinburn, River Flow Chairman
for John Vraspir, President
Washington Kayak Club

Tom Waggner by ltr

Tom Wagoner, President
Paddle Trails Canoe Club

STATE OF
Washington

WASHINGTON STATE PARKS AND RECREATION COMMISSION
7150 Cleanwater Lane, Olympia, Washington 98504 206/753-5755

March 3, 1980

35-2650-1820
DEIS - Green Duwarish River
Basin Instream Protection Program (E-1846)

Department of Ecology
Attention: Hearing Officer
Olympia, Washington 98504

Gentlemen:

The staff of the Washington State Parks and Recreation Commission has reviewed the above-noted document and has the following comments:

1) It is an established fact that the Green River offers such recreational opportunity. This fact has been well substantiated by the Washington State legislature and the action that they have taken in setting aside the Green River Gorge Conservation Area. The Washington State Parks and Recreation Commission has followed through with this mandate by acquiring substantial portions of property and developing one day use and access point. It is the intention of the Commission to make available to the public the Green River Gorge by means of controlled and managed recreational access points. Preservation of the Gorge area's wild environment is a key goal of our entire recreational development plan (see enclosed The Green River Gorge. A Conservation Proposal). Impacts on the environment are minimized by park layout and planned management. We are presently contemplating development of the Palmer Site at river mile 55.5 - 57.3 in the upper Green River Valley above the gorge. Development of recreational facilities is felt essential to increase and enhance recreational opportunities. Legislative support bears out this belief. The following paragraph on page 7 under the Recreational Resources section is in part true but by no means conclusive.

   The upper valley below Howard Hanson Dam is a regional recreational resource of considerable value. There are five park locations in this stretch of the river, which permit direct access to the river. Activities such as fishing, floating, canoeing, kayaking, and exploring can be carried out without any further development of recreational facilities.

2) No mention of water storage or water discharge allocation for "Scenic and Aesthetic", "Navigation", or "Other Environmental Values" exists in the Draft Instream Resources Protection Program. These categories make up 3 of the 6 utilized in rating the Green-Duwamish Basin by the methods as

is stated on page 23, Stream Rating section as *"described in detail in the FEIS and Program* Overview *for the Western Washington Instream Resources."*

Water allocations in your program appear to pertain to agencies managing fisheries resources and water right holders. This separates water-using groups, since activities pertaining to the categories *"Scenic mid Aesthetic", "Navigation",* and *"Other Environmental Values"* do not require water right acquisition, but surely are dependent upon instream flow management. Possibly water allocations may be granted for the activities related to the above listed categories if nonconsumptive water rights were acquired. Inclusion of recreational activities as being water dependent is a mandatory appropriation, since the legislature has gone to such lengths to set aside (preserve) the Gorge and provide funds for substantial facility development. **138**

3) During the review period of the document of concern here, Washington State Parks and Recreation Commission staff has met with Tom Steinburn, a representative of the Washington Kayak Club. Tom produced a final letter of comment on the document and submitted a copy to our agency. The letter representing the Paddle Trails Canoe Club well exemplifies water flow allocational needs for a water dependent recreational activity. The Washington State Parks and Recreation Commission staff acknowledges the letters thematic direction. The Washington State Parks and Recreation Commission staff cannot verify the actual flow regime requested but endorses the concept. **139**

Due to the out-of-print status of The Green River Gorge. A Conservation Proposal, we would appreciate the return of this report after your review. There may be one or more copies in your agency library at this time.

Thank you for the opportunity to review and comment.

Sincerely,

David W. Hetser, E.P., Chief
Environmental Coordination

DWH/GH:jh

Enclosure

cc: Tom Steinburn, Washington Kayak Club
Daren Johnson, Assistant Director, Resources Development
Tom France, Chief, Site Planning and Acquisition
Bill Bush, Chief, Research and Long Range Planning

James J. Leonard
10626 S.E. 236th Place
Kent, Washington 96031

Subject: Water Supply - City of Tacoma

Dear Senator Shinpoch:

It never ceases to amaze me how City, County, State and Federal Govts continue to hoodwick and deceive the public. Additionally I'm greatly chagrined to see my own profession assume the position that the Green Rive is the only economical source of potable water for Tacoma.

Let me state a fact. I have on many occasions in the past shown that series of deep, large diameter water wells has proven the most economical source of water. The reasons are basic and simply and apply in the vast majority of cases (1) cost of water treatment is usually much lower and simpler. In most instances only chlorination is required. Filtration areation coagulation, etc. is normally eliminated. Thus millions are saved in construction costs or treatment plants and the annual cost of water treatment. (2) Normally well field(s) can be developed in proximity to the user. This can (and would in the case of Tacoma) save millions in the cost of pipeline construction and the subsequent maintenance costs generated. (3) Once properly developed and construted ground water sources are more reliable than surface sources. Unusual periods of low rainfall have less effect on productivity of ground water sources (wells) as opposed to surface sources. (4) The taking of water from wells has no effect on the environment. The diversion of surface water for domestic purposes can often times have a drastic and detrimental effect particularly during periods of relative drought. This latter circumstance has occurred in 3 years of the past 6 years in this area. (5) Geologically: The Seattle-Tacoma area has vast fields of deep water-bearing gravels with extensive aquifers continuously being recharged from streams and precipitation. **140**

The city of Tacoma states that "By catching more runoff behind Howard Hanson Dam the new pipeline would reduce the spring scouring of the river which endangers fish". I believe this is Hogwash. First, I'm sure the Corp of Engineers in cooperation with fisheries minimizes this to the greatest extent possible. However Howard Hanson Dam is primarily a flood control project and reservoir (pool) elevations are maintained almost exclusively for flood control purposes and understandably so. **141**

In conclusion, if the city of Tacoma were to be successful in this giant ripoff on the Green River, tens of thousands of people could be deprived not only of one of the best fisheries of the states but a beautiful recreational area for swimmers boaters, tourists and just plain 'ol nature lovers. I can remember in the summer of 1979 when the water levels of the Green River were so low there were only a few pools for swimmers, continuous float trips were impossible and because of such low water the oxygen content was so low and water temperatures so high that significant mortality of this fishery occurred.

With viable alternatives, is the city of Tacoma going to be permitted to cheat the masses of Pierce and King Counties and the rest of the state out of this beautiful resource?

If anyone thinks I've dramatized the case for the Green River they should check with reputable ground water engineers, geologists, sanitary engineers ecologists, the U.S.G.S., all those really experienced in this sort of thing.

Respectfully Yours

James J. Leonard

Civil Engineer

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

MAR 10 10 53 AM '80

NPSEN-PL-RP

5 March 1980

Hearing Officer
Washington State Department of Ecology
Olympia, Washington 98504

Dear Sir:

This is in response to your December 1979 request for public review and comment on proposed Instream Resources Protection Program for the Green-Duwamish River Basin.

As agreed between Mr. Rod Sakrison and Mr. Jim Newman of my staff on 28 February 1980, the deadline for review comments was extended to 5 March.

Our comments are attached as inclosure 1. We hope these comments will clarify our concerns and will be constructive to your program. We have concerns about the report, and urge careful consideration of all comments before final determination of minimum instream flows in made. We recommend that adequate time be given to interested agencies and others to fully evaluate the impacts of increasing minimum streamflows.

We are also including the statement presented by Mr. Dwain Hogan, Chief, Planning Branch, at your public hearing held 7 February 1980 at the Auburn City Hall (inclosure 2).

Thank you for the opportunity to review Green-Duwamish River Basin program documents.

Sincerely,

LEON K. MORASKI
Colonel, Corps of Engineers
District Engineer

2 Incl
As stated

Comments on Washington State Department of Ecology's
Green-Duwamish River Basin
Instream Resources Protection Program

1. General Comments. Overall, the report is somewhat misleading with regard to Corps of Engineers' operation of Howard A. Hanson Dam and the benefit to fisheries. In the congressional document authorizing and setting out the procedures for operation of Howard A. Hanson Dam, low flow augmentation for fisheries was cited along with flood protection as needs which could be fulfilled by construction and operation of the project. However, the primary purpose was flood control - "The use of (Howard A. Hanson) Dam for flood control will require reservation of the entire storage from the first of November to the first of March to detain possible flood flows." Other purposes of the project included low flow augmentation for fisheries, irrigation, water supply, industrial expansion, and agricultural enhancement. The low flow level for fisheries was agreed upon by appropriate wildlife agencies after considerable study. **142**

We acknowledge that since the time 110 cubic feet per second (c.f.s) was established, the state-of-the-art in fisheries management may have changed, prompting the Washington State Department of Fisheries to now consider this flow level inadequate. However, the manner in which this issue is stated in a number of places in the report infers instead that the Corps is not being responsive to current day needs. We wish to go on record to state that the 110 c.f.s. low flow augmentation has enabled the Corps to enhance local fisheries. Indeed, on numerous occasions, Department of Fisheries requests for higher releases from Howard A. Hanson Dam during critical low flow periods have been fulfilled. Without the Corps' cooperation in these instances, fish mortality would have been greater. **143**

If the state-of-the-art has changed sufficiently in the intervening years to warrant increasing the minimum flow levels, this should have been the focal point of the report. As now stated, no scientific evidence has been presented to convince the reader that 110 c.f.s. is no longer adequate. **144**

There also appears to be a misunderstanding concerning the nature and extent of the Corps' present study in the Green River Basin. Briefly, flood control studies of the Green River Basin were conducted during the 1960's and early 1970's. Upon completion of checkpoint 1 studies in 1971, which recommended further study of two levee improvement alternatives, the local sponsor, King County, requested a study deferral. The request was based on King County's desire to develop a comprehensive recreation plan which would coincide with levee improvements. Following completion of the recreation plan in August 1979, a revised plan of study was prepared and was sent to higher authority. Upon the plan of study's approval, the document will be available to other agencies and the public.

There are numerous references in the text to Corps' reauthorization studies on Howard A. Hanson Dam. However, there is no comprehensive reauthorization study of the dam underway. Three public agencies have separately approached the Corps about modifying operation of the dam to accommodate their individual interests - King County for flood control, city of Tacoma for water supply, and Washington State Department of Ecology (WDE) for low flow augmentation. Since these purposes may not be compatible, it is recommended that King County, Tacoma, and WDE initiate a coordinated request for a comprehensive examination of the dam's operation. **145**

In the interim, we would welcome discussions regarding flow levels for the Green River. However, until a study has been completed, situations arising during critical periods will have to be addressed on a case-by-case basis. **146**

There is one significant omission in the report's Water Resources Development Plan section. At the request of the Port of Seattle, we are conducting a navigation study on the lower Duwamish River. The study is investigating alternative means of widening and deepening the river channel. Since channel modification could affect water quality, the navigation study should be included in this document.

2. Specific Comments. The following comments are largely editorial in nature, but we feel they more accurately depict the Corps and our operation of Howard A. Hanson Dam:

a. Page 4. Mention should be made that prior to construction of Tacoma's diversion dam, salmon and steelhead were found upstream of the area in which the dam is now located. Tacoma's diversion dam stopped this migration. Howard A. Hanson Dam, constructed later, has enhanced natural flow conditions.

b. Page 69 paragraph 4. Suggest rewording to: "Flow releases downstream from these facilities, although augmented by releases from Howard A. Hanson Dam, are often insufficient to alleviate poor water quality conditions."

c. Page 9, paragraph 4. Suggest rewording to: "The project, an earth-filled dam at river mile 64, was authorized to provide for flood control, conservation, municipal water supply, and irrigation. Pollution abatement and industrial expansion gave secondary benefits. Flood control and low flow augmentation were given as purposes in the authorizing document, for which a definite present need exists. Future uses of storage capacity for pollution abatement, municipal water supply, and irrigation were recognized."

d. Page 9, pargraph 5. Suggest rewording to: "These releases are as high as 10,000 c.f.s. when the reservoir is being emptied after a storm."

e. Page 10, paragraph 1. Suggest rewording to: "The flood season generally extends from November 1 to, March 1."

f. Page 10, paragraph 2. Suggest rewording to: "During this period, a minimum of 225 c.f.s. or 110 plus inflow, whichever is least, is passed by the dam during low flows."

g. Page 10, paragraph 3. 1,171 feet should be 1,141.

h. Page 10, paragraph 3 and Table 2. This table and preceding text are misleading. The dates in the table are presented as times when the Corps violated the 110 c.f.s. minimum low flow. However, the authorizing document states that the dam can release 110 c.f.s. low flow augmentation from March until September. Five of the "violation" dates occurred after September. The table is reproduced below with inaccuracies underlined. **147**

Date	Flow
November 3, 1965	184 c.f.s.
September 29, 30, 1967	208 c.f.s.
October 9, 10, 11, 1967	204 c.f.s.
September 10, 11, 12, 13, 1969	139 c.f.s.
August 5, 6, 29, 30, 31, September, 1, 1970	188 c.f.s.
October 2, 3, 4, 5, 1970	220 c.f.s.
October 13, 1971	215 c.f.s.
June 8, 9, 1973	202 c.f.s.
September 29, 1974	210 c.f.s.
November 1, 2, 3, 4, 5, 6, 1974	124 c.f.s.

i. Page 11, paragraph 2. The following statements are inaccurate: "Abnormally turbid waters may be released from the dam during periods of reservoir maintenance. These procedures are intended to flush sediments that have deposited behind the dam, inhibiting flood storage." Turbidity may be incidentally increased by our maintenance activity, but there is no "flushing" procedure. We frequently reduce releases upon Tacoma's request to hold back turbid runoff. When the flow is finally increased, the turbidity increases for a short time.

j. Page 13, paragraph 5. The statement: "Under 100-year base flood conditions" - is not clear in regards to interior or exterior conditions. It does not seem to relate to operation of Howard A. Hanson Dam. Suggest it be qualified.

k. Page 14, paragraph 1. Suggest rewording to: "The Green River channel is bankful at 12,000 c.f.s."

l. Page 20. Another step may be needed in Tacoma's procedure to acquire additional water. Storing more water behind Howard A. Hanson Dam may result in a higher turbidity level. Tacoma may then have water. Tacoma may have water quality problems and may need to treat their drinking water. Instream water quality may also be affected. **148**

m. Page 24, paragraph 2. How was the 63 percent exceedence level selected? Is it a standard or was it arbitrarily selected? **149**

n. Draft Environmental Impact Statement. General. Has streambank erosion as a potential impact from higher flows been examined in the programmatic EIS? **150**

o. EIS, page 3, paragraph 6. Suggest rewording to: "Based upon one of its authorized purposes, Howard A. Hanson Dam releases at least 110 c.f.s. during the normal low flow period as long as storage is available."

p. Page 3, paragraph 7 Suggest rewording to: -Heavy rains or rapid snowmelt can cause excess turbidity in the stored water. Since Tacoma's water must pass through the reservoir and turbid water is unacceptable to the city, the practice is to store water as late as possible to miss high flows with high turbidity. The availability of water to fill the reservoir is estimated from measurements of the snowpack in the watershed."

q. Page 4, paragraph 2. Suggest rewording to: "This could make filling the reservoir with water of acceptable quality more difficult." **151**

r. Page 4, last paragraph. Suggest rewording to: "Additional storage would mean less flexibility to fill the reservoir with water of acceptable turbidity."

s. Page 4. Your statement, "Unfortunately, the dam may not be able to store the additional 69,000 acre-feet for an extended period without experiencing leakage problems," is misleading. It should be clarified and redescribed as abutment seepage. As stated, there is an implication that the seepage could be more serious than it is. **152**

t. Page 5, paragraph 1. Suggest rewording to: "Storage would have to begin earlier than at present and the chance of excess turbidity could be greater."

King County, State of Washington
John D. Spellman, County Executive
Department of Budget and Program Development
Room 400 King County Courthouse
516 Third Avenue
Seattle, Washington 98104
Mary Ellen McCaffree, Director
(206) 344-3434

February 28, 1980

Mr. John Spencer
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504

RE: Green/Duwamish River Basin in-Stream Resource Protection Program - Proposed Administrative Rules and DEIS

Dear Mr. Spencer:

King County has completed its review of the proposed in-stream flow regulations and draft EIS for the Green/Duwamish River Basin. Our comments have been coordinated with other County departments and supplement County Executive Spellman's testimony given at the February 7 public hearing in Auburn on the proposal.

1. King County supports the overall objectives of the in-stream resource protection program being carried out by the Department of Ecology. Establishment of minimum and critical flows for the Green/Duwamish River Basin is a necessary first step to protect both consumptive and non-consumptive water users and is an important component of on-going efforts to optimize management of the basin's water resources. At this time it is felt that the existing base of 110 cfs at Palmer is inadequate. **153**

2. River-oriented recreation lands and opportunities in the basin being developed by Washington State Parks, King County and the Green River Valley cities are extensive and diverse. To a large extent these park and river access facilities are dependent upon the river, its aquatic life and the biotic community it supports. The EIS should address the impacts associated with low river flows and their effect on river related recreation and the relationship between low flows, recreation use, and potential conflicts with cover and spawning area needs of the fishery. The River of Green study notes that in-river recreation uses are severely curtailed during extreme low flow conditions and these impacts should be documented. **154**

3. King County is very concerned that the low flow provisions established for the Green River in the Congressional authorization for Howard Hanson dam are not always being met. Low flow augmentation for fisheries enhancement is a specific purpose of the authorizing legislation and must be ensured to fulfill the intent and purpose of Congress and the sponsors of the project. **155**

Management policies, operational procedures and maintenance provisions for regular and emergency conditions between the Hanson dam and Tacoma diversion facility need to be clearly documented, preferably by formal interagency agreements. These agreements, which the State should take the leadership to secure, are needed to guarantee that existing and future minimum flows are met and to provide a measure of early warning and public safety in the event of rapid reservoir draw downs or release cutbacks. **156**

4. The proviso under paragraph (2)(a) of WAC 173-509-020 giving the director of DOE, or his designee, the authority to declare a critical condition and to reduce in-stream flows below critical year minimums needs amplifying definition. Such a proviso, without specific guidelines or criteria setting out the conditions under which such a declaration can occur, allows for far too much administrative discretion and could be subject to special interest pressures. A clarifying definition and/or criteria including the provision that DOE notify all affected agencies including local general purpose governments when critical conditions are to be imposed would provide a much needed safeguard and reduce the potential for indiscriminate use of administrative authority. **157**

5. More detailed information is needed regarding the operating plan and procedures DOE proposes to use to implement the in-stream flow program in the Green, specifically, the methodology for coordinating the gages at Palmer and Auburn and the flows past those gages. Consideration should be given to lengthening the time intervals between draw down and build up of flow volumes as well as the possibility of coordinating in-stream flows with biological and fisheries needs as well as water availability rather than adhering to rigid calendar dates. The implementing procedure should also discuss what, if any, reservoir management plan is contemplated for water stored behind Howard Hanson dam. **158** **159**

6. The discussion of alternatives and mitigation in the EIS is brief to the point of being inadequate. Alternatives to the proposal identified in the programmatic EIS for Western Washington surely don't cover the full range of alternatives available in all river basins; particularly in the case of the Green where an interagency agreement to manage river flows has been proposed by King County as a desirable option. Mitigation itself or some combination of mitigation and minimum flow regulations could also be considered reason- able alternatives that should be evaluated. Mitigation of the adverse impacts incurred from setting flows lower than those desired by fisheries agencies and other users should also be addressed in the EIS. **160** **161**

7. Testimony and input to date on the in-stream proposal for the Green/ Duwamish River Basin indicate there is substantial disagreement on the optimum low flow regime that DOE should establish for the river. This divergence of position suggests the need for further research and discussion among the various agencies before

minimum and critical flow numbers are recommended for the Palmer and Auburn gaging stations. **162**

8. On page 14 the statement reading "King County grading and clearing ordinance is a preliminary screening of drainage ordinance compliance..." could be deleted. Grading and clearing permits are reviewed for drainage plans and are approved or disapproved like any permit. **163**

Thank you for the opportunity to review and comment on the in-stream program for the Green/Duwamish River Basin. We welcome the opportunity to participate in additional studies or meetings on the program and request the County be kept informed of any activities scheduled for that purpose. If you have questions regarding these comments, please contact Mr. Donovan Tracy, Section Head, Resource Planning Section at 344-7990.

Sincerely,

Mary Ellen McCaffree

MEM:mas

Hearings officer
State of Washington
Olympia, Wash. 98504

Comments of Friends of the Earth on the proposed Green River Basin Instream Resources Protection Program (173-509 WAC)

General Comments

We are pleased that D.O.E. is moving forward in protecting one of our state's important natural resources, rivers and streams. We encourage them to act swiftly, but to consider each river system fully and completely.

The proposed instream flows are below those recommended by the U.S. Fish and Wildlife Service as the bare minimum for protection of fish and wildlife values. We feel that their expertise should be given full credit and instream flows be at levels of 300 cfs at Palmer at the vary least. D.O.E. should take what measures necessary to guaranty these flows from the Corp, through the operation and possible structural changes of the Howard Hanson Dam. **164**

Specific Comments

1) The Supplemental E.I.S. is lacking in critical details to make even simple estimates as to the effects various flow levels would mean to fish, recreation, etc. Example: Information as to the inflows to the Howard Hanson Dam in past and recent years would allow some idea as to what normally the flow levels would have occurred downstream. **165**

2) As mentioned by the Dept. of Fisheries, the shift in flows from 300 to 800 cfs needs to begin Sept. 25 rather than Oct. 1 to facilitate peak spawning of Chinook salmon utilizing the Green River system. **166**

3) We feel that instream flows, adequate to insure fish development, are as important as future water (an out of stream) acquisition by the City of Tacoma. People must realize that clean water, like energy, is a limited resource that needs to be utilized efficiently if the future is to hold a liveable environment. The high cost for purification may increase conservation measures now, thereby decreasing even more demand in the future.

A possible alternative:

If increased storage capacity behind the dam is feasible, there may be a trade off available between drinking water and minimum instream flows. Perhaps more wells could be drilled for clean drinking water and thus allow the retention of the turbid water commonly dumped in spring. Along with an earlier onset of increasing the storage level by the Corp., this could ensure a larger reserve for summer flows. **167**

4) A side note pertaining to the Renton treatment plant and its dumping of pollutants.

At pre sent Metro is conducting the Lake Washington - Green River Basin Wastewater Management Study. The major alternative being considered is the enlargement of the Renton treatment plant. We urge D.O.E., for the following reasons, not to grant the permit needed for this expansion.

Even if minimum instream flows are increased to those proposed by the Dept. of Fisheries, i.e., 300 cfs at the Palmer gauge or 450 cfs at Auburn, the current dry weather average flow from the Renton plant is 56 cfs. This means a STP dilution of 8:1, well below the 20:1 standard. **168**

This is an optimum average dilution which drops drastically as waste effluents reach maximum flows. D.O.E.'s proposed instream flow of 150 cfs at Palmer lowers this dilution factor to an average dry period level of 5.3, with minimums as low as 4:1. The proposed doubling of the Renton capacity by Metro would further cut these dilution factors by half. Fish migration through these waters could be gravely impaired. We propose again to increase the instream flows above 150 cfs for the protection of fish from already existing hazards. No increase in the dumping of treated waste should be allowed (Permits to be issued at the present levels) and this decision by D.O.E. be sent immediately to Metro before expansion decisions are finalized. This will have a large bearing on alternatives to be considered.

169

We thank you for the opportunity to make these comments and hope they will be of value in your final determinations of instream flows for the Green River Basin.

Sincerely,

Wayne J. E. Lamm

Wayne J. E. Lamm
Member of F.O.E.

CITIZENS COMMITTEE FOR CLEANWATER

107 SOUTH MAIN, SEATTLE, WA 98104 / 623-1483

March 11, 1980

Wilbur G. Hallauer, Director
Washington State Dept. of Ecology
Olympia, Washington 98504

Dear Mr. Hallauer:

We are pleased to congratulate you and your staff on the excellent public hearing held February 7, 1980 on the Departments' Instream Resource Protection Program, for the Green-Duwamish River. Every one managed to state their position after a few disruptions and much was learned by being there.

As can be learned from the record of the hearing, a need for strong aggressive coordination of water resource planning and pollution control is very much a necessity. The Department of Ecology has the experience and expertise as well as the authority. We applaud the decision of the department to use this authority to protect the public's interest.

We encourage the Department to carry on with this active leadership and management of this important resource.

Yours very truly

Thos. O. Wimmer

Thos. O. Wimmer
Citizens Committee For Clean Water

cc/ Mr. Arpad Masley, Chairman
Ecological Commission

CITIZENS COMMITTEE FOR CLEANWATER

107 SOUTH MAIN, SEATTLE, WA 98104 / 623-1483

March 11, 1980

Mr. Arpad Masley, Chairman
Ecological Commission
Box 350 A Star Route 1
Belfair, Washington 98528

Dear Mr. Masley:

We attended the February 7, 1980, public hearing on the Department of Ecology's, Instream Resource Protection Program for the Green-Duwamish River and submitted the enclosed statement in support of their program.

The hearing was lively with most of the audience favoring the program. Opposition did come from the Water Department of the City of Tacoma, supported by representatives of the City of Seattle and the State Department of Social and Health Services.

A well thought out statement from King County Executive, Mr. John Spellman, called for coordinated water resource management under State leadership. Our recommendation is very similar.

We believe that this excellent public hearing revealed as opportunity for the Department of Ecology to assume a more active leadership role in resolving both near-term and long-term water resource and pollution control problems in east-side Puget Sound river basins. The near-term problems relate to control of pollution that could destroy the salmon and steelhead runs. The long-term problem is to create an effective forum for equitable allocation of the region's water resources.

The Ecological Commission, by the nature of your operations and authority, can encourage the Department of Ecology, to provide the needed leadership. Once assumed and operational, your commission could through its open public meeting procedures, be of tremendous help in facilitating the public education and information transfer. Public dialogue must accompany the State's leadership in coordinating water resources and pollution control programs, if they are to be successful.

If we can be of service in this important effort we would be pleased to participate.

Yours very truly
Thos. O. Wimmer
Thos. O. Wimmer
Citizens Committee For Clean Water

cc/ Wilbur G. Hallauer, Director
Washington State Dept. of Ecology
Members of the Ecological Commission

CITIZENS COMMITTEE FOR CLEANWATER

107 SOUTH MAIN, SEATTLE, WA 98104 / 623-1483

February 7, 1980

February 7, 1980

Department of Ecology
State of Washington
Attention: Hearing Officer
Olympia, Washington 98504

My name is Tom Wimmer. I live at 7756 Seward Park Avenue South, in Seattle. I am speaking for the Citizens Committee for Clean Water.

Our Committee has reviewed the draft document dated December 1979 describing the Department of Ecology's Green-Duwamish River Basin Instream Resource Protection Program.

We are in complete support of this program.

Our review indicated, however, that there are possibilities for compromise or delays that can effectively block achieving the instream resource protection desired. Four possibilities have been identified: 1) inadequate capacity of METRO's Renton plant, which discharges secondary treated sewage into the Duwamish River; 2) increased pollution of the central Puget Sound Basin through which fish must swim to reach, or to leave, the Green-Duwamish River; 3) diversion to other purposes of stored water now allocated to instream resources protection; and 4) co-ordination of water resource planning and projects in the region or sub-region.

Inadequate capacity of METRO's Renton Sewage Treatment Plant. METRO's Renton plant has inadequate capacity to treat its sewage discharges into the Duwamish River during the late summer and fall. This is just when the summer-fall runs of chinook, coho, chum, steelhead and sea-run cutthroat are taking place in the river and need good quality fresh water. Downstream migrants have even a greater need for high quality fresh water as the juvenile fish are much less tolerant of the heavy metals and toxicants in domestic sewage than are the returning adult fish.

The duration and margin of plant incapacity will increase in the years ahead because the population in the "Renton service area is increasing. No relief can be expected before about 1990.

because of the relative low priority this plant has within the State for construction grants.

Questions arise: At what point will the increased amounts of inadequately treated sewage from METRO's Renton plant cause the complete blockage of summer-fall salmon and steelhead migrations--both upstream and downstream--and thus the destruction of the instream resource whose protection we are discussing tonight? Is the timing of the necessary relief solely a METRO decision? What can be done to make things happen a great deal sooner? **171**

Increased pollution in the central Puget Sound Basin. All the races of migrating fish that are considered instream resources must transit the central Puget Sound Basin twice during normal life cycle. If they are to survive to become an instream resource, the central Puget Sound Basin must be a livable habitat. This is no longer a sure thing, because the central Puget Sound Basin is being used as a septic tank by at least 24 sewage systems, discharging an average of 204,000,000 gallons per day into the basin. Most of this sewage has received only primary treatment.

Already 76 percent of the central Puget Sound Basin is closed to commercial shellfish harvesting due to fecal contamination or the great potential for such contamination from nearby municipal sewage treatment facilities. This means the shellfish in these polluted areas are not fit to set.

The pollution from sewage is scheduled to get worse as our population increases By the year 2005--now only 25 years away--an average of 500,600,000 gallons of sewage will be discharged into the central Puget Sound Basin every 24 hours.

The METRO system alone is dumping an average of 80,000 pounds of sewage solids into Puget Sound every day. These solids carry with them poisonous and semi-lethal heavy metals and toxicants. Substantial amounts of these heavy metals and toxicants can be removed by secondary treatment of sewage.

Yet METRO is seeking a waiver from the Federal law that requires secondary treatment. And 23 other sewage systems are reported to be planning to seek the same waiver.

The question arises: Will the races of migrating salmon and steelhead be able to make two transits across the increasingly polluted central Puget Sound septic tank in sufficient numbers and in condition to maintain the resource? Our Committee doubts that they will.

And in any case we regard the granting of a waiver from secondary treatment as taking unwarranted risks with Irreplaceable food protein and recreational resources.

Illegal diversions. Substantial proportions of the cost of the $40,000,000 Howard Hanson Dam have been allocated to instream resource protection. Funds for construction were obtained from Congress, supplemented by $1,500,000 from the State of Washington and $500,000 from the County of King. The City of Tacoma did not participate in the cost of the project, which is designed to provide nearly three-quarters of the instream resource protection established as a goal in the program being discussed tonight. At best, present operational or communication procedures threaten the loss of this protection, and at worst can actually permit Illegal diversions to the City of Tacoma's water system just when the fish in the Green-Duwamish River are in the most need of the diverted water. **172** **173**

The question arises: How can this very real threat to the instream resource program be eliminated? **174**

Coordination. The draft document lists five other water resources or water resources or water pollution control projects active in the Green-Duwamish basin. The number of participants at local, State and Federal levels is much more than five. All will impact directly or indirectly on the instream resources to be protected. And all the entities involved are operating on different agendas, with different objectives and different political managers.

If there is to be a maximization of public benefits, including effective instream resource protection, some formal coordination must be achieved.

The question arises: Who should assume this responsibility?

Our Committee's responses to the previously identified questions follow, in reverse order to their presentation.

Coordination. The laws establishing the Department of Ecology are both implicit and explicit in empowering it to act as a lead coordinating agency. Moreover, it is not a new role for the Department. Accordingly, we recommend that under Department of Ecology leadership and initiative an inter-agency task force be established immediately to coordinate all the water resource and pollution control projects in the river basins tributary to the Central Puget Sound. **175**

The task force should include representatives of all concerned entities, committees, Indian tribes and citizen groups. Effective coordination with Federal agencies can be achieved through the Intergovernmental Cooperation Act of 1968 and through the Pacific Northwest River Basins Commission.

Avoiding illegal diversions. We also recommend that the Department of Ecology, acting on its initiative and under its leadership, immediately organize a work group of State, Corps of Army Engineers and City of Tacoma representatives to address operational and communication procedures at Howard Hanson Dam and the City of Tacoma's diversion structure. The objective would be to preclude future illegal diversions, by managerial procedures if possible, or by structural changes if necessary. As we see it, structural changes are a responsibility of the City of Tacoma to avoid the liabilities that might arise from illegal diversions or a responsibility of the Corps of Army Engineers to assure the instream resource protection purchased by the Congress, the State of Washington and the County of King. **176**

The work group could be a sub-committee of the previously recommended task force but need not wait for it to become operational before starting their deliberations.

Pollution in Puget Sound. Permitting increased pollution of Puget Sound is grossly inconsistent with tributary instream resource protection. You cannot strive for a livable habitat in fresh water and ignore the increasing hazards from pollution in the salt water habitat. Secondary treatment will assure that present conditions from polluting sewage solids will get no worse for another 30 or 40 years. Therefore we recommend that the Department of Ecology formally and immediately object to METRO's request for waiver from secondary treatment. Similar immediate objections should be issued to any other sewage system seeking to increase its pollutant loading of sewage solids into Puget Sound. All should be directed to proceed with upgrading their plants or systems so that no increases in pollutant loads of sewage so lids result for at least another 25 or 30 years.

Inadequacy of Renton plant. Because of its inadequate capacity, the Renton sewage plant is a public nuisance in its effect on the instream resources of the Green-Duwamish River Basin. Its effluent could completely block fish passage. Therefore, we recommend that the Department of Ecology immediately direct that this nuisance be abated. This can be accomplished by expediting design and construction through giving the problem higher state-wide priority for construction grants. Failing that, METRO should be directed to correct the problem through its own resources, i.e., revenue bonds backed up by developer and user charges.

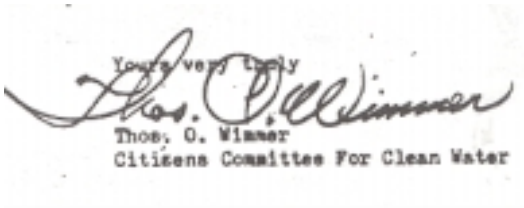
In this connection, we note that Mr. Neil Peterson, Executive Director of METRO, recommended expansion of the Renton plant as part of METRO's long-term Preferred Facility Plan. This was done in August 1978, 17 months ago.

Time is rushing by--correctable pollution is increasing and may completely negate your excellent instream resource protection program. So our Committee says:

LET'S GET ON WITH THE JOB BEFORE IT'S TOO LATE!!

This completes our statement.

We appreciate this opportunity to testify, commend you on your efforts, and we look forward to early and effective implementation of your program. If we can be of assistance or support, please call on us.



C.F. Ecological Commission

URS

February 7, 1980

Washington State
Department of Ecology
Olympia, WA 98504

Re: Green-Duwamish Basin
Instream Resources Protection Program

Gentlemen:

This letter is written on behalf of King County Water District No- 124. The commissioners are concerned about the impact of the proposed administrative rules and asked that I prepare these comments to express their concerns.

King County Water District No. 124 serves approximately 45,000 people in the Federal Way area of southern King County. Their current source of supply is from groundwater within the district boundaries. The supply has been expanded through the years as needs developed. Previous studies have indicated that there will be a future need to secure a source of supply from other than groundwater aquifer. The commissioners recognized this need about 25 years ago and applied for a water right from the Green River to satisfy this need. The presently approved comprehensive water system plan for the District indicates a future need to develop this supply or to negotiate with the City of Tacoma to secure water from their proposed Pipeline No. 5. **177**

The procedure used to develop the proposed regulations caused considerable concerns. Apparently the only element considered was the concern by the Department of Fisheries for water for the fish runs. As I read RCW 90.54.020, several other fundamentals for utilization and management of waters of the state are listed that should be considered. A principal item woven through these fundamentals is the need to provide an adequate and safe supply for public consumption. **178**

We question the need for setting the minimum flow at 300 cfs. I have not had time to make a detailed study of river flow history but am aware of many instances where the minimum flow was lower than the 110 cfs established at the time the Howard Hansen Dam was constructed. Other reports have indicated that the fish runs were better during the time that these low flows occurred than they are now. **179**

The data used for justification of the proposed flows were apparently developed after a minimum amount of study. These studies indicate a hint that the low flows may impact the fish run. There are many factors that affect the fish runs. There is a need for much more study to incorporate all of these elements to justify such high minimum flows. **180**

The provisions of WAC 173-509-020(l)(a) that permits the director to, in effect, cut off a municipal-water supply could have a very serious negative impact on the public. This section places too much authority in one person. This is especially true when excessively high minimum streamflows are established in the regulations. There needs to be more definite criteria to establish when the director can exercise this authority. **181**

The provisions of WAC 173-509-040 could cause the district serious problems. Future expansion of groundwater rights is critical in meeting the needs of the public. How does the Department of Ecology determine when to deny a water right for groundwater withdrawal? There are many cases that would be difficult to make a determination as to whether withdrawal of groundwater actually has an impact on the flow in the stream or not. **182**

The Department of Ecology should reevaluate the proposed regulations and consider all items established in RCW 90.54. It is important that the provision of an adequate, safe water supply is maintained for the sustenance of human existence. This water supply for public consumption is critical to the continued well-being of the citizens of the State of Washington. We urge that the present minimum flow of 110 cfs not be increased. **183** **184**

Very truly yours,

Bernard J. Christensen, P.E.
Vice President

BJC/dml

cc: King County Water District No. 124

STATE OF
Washington
Dixy Lee Ray
Governor

DEPARTMENT OF SOCIAL AND HEALTH SERVICES
1409 Sixth Tower, Seattle, Washington 98104

February 1, 1980

Hearings officer
Department of Ecology
Olympia, Washington 98504

Subject: Green-Duwamish River Basin
Instream Resources Protection Program

Gentlemen:

I would like to make the following comments concerning the proposed Administrative Rules establishing instream flows on the Green River. I have been personally acquainted with the Green River since the late 1930's. Since that time, through my position as an Engineer with the State Department of Health and now the State Department of Social and Health Services, I have been able to observe the characteristics of the River and its uses, including the low flows.

The Green River has been recognized by our Department and the residents of the State of Washington as the source of municipal and industrial water supply for the City of Tacoma. Through the orderly and costly development of that water resource, the City of Tacoma has developed a public works project which has brought reliable, high quality water to a large area of Southern King County and Pierce County, as well as the City of Tacoma. From my personal knowledge before the construction of the Howard Hanson Dam, the low flows in the Green River below the City of Tacoma's diversion, were less than 40 cubic feet per second (cfs). With the construction of the Dam in the late '50's and early '60's, the low flows were increased to 110 cfs which was arrived at after considerable discussion and study by the Corps of Engineers and the (then) Departments of Fisheries and Game. The low flow posture of that river was greatly improved by construction of the Howard Hanson Dam and it would appear to me your proposed rules and regulations which would further increase the low flows in the River are unwarranted. **185** **186** **187**

The State of Washington is in need of a number of first-class major water systems to serve the population centers. These centers are already established but their water systems are limited in scope of development and availability of water resources. The Fisheries and Game Department, on the other hand, have a greater latitude as to which river can be modified to improve the fisheries production and resource. To recommend utilizing a high quality water from a source which already has superior public use, that is, public water supply, is unsound and not in the best interest of the citizens of the State of Washington. The Department of Ecology has a responsibility to the citizens of this State to assure the optimum utilization of the State's water resources. The use for municipal water supply **188**

purposes, including industrial utilization, is Number One priority. Fisheries interests should be considered, as well as aesthetic and recreational concerns for the River, but to pursue a course of reallocating a portion of our State's waters to a use in conflict with the already stated intended use of that resource, does not serve the best interests of the citizens of the State of Washington. **189** **190**

I would strongly urge the Department of Ecology to seriously consider defining those streams which are now dedicated to public water supply systems, and then assist the Department of Fisheries and Game in developing their interests in areas where conflicting uses do not arise. The established low flow for the Green River should remain at 110 cfs which is consistent with presently established agreements. **191**

Very truly yours,

Robert E. Leaver

Robert E. Leaver, P.E.
Supervising Engineer
Water Supply and Waste Section

REL:bv

cc: City of Tacoma, Water Division
Pierce County Planning Department
King County Planning Department
Tacoma/Pierce County Health Department
Seattle/King County Health Department
U.S. Corps of Engineers
U.R.S. Company
KCWD No. 124

STATE OF
Washington
Dixy Lee Ray
Governor

DEPARTMENT OF GAME
600 North Capitol Way, GJ-11 Olympia, Washington 98504 206/753-5700

February 5, 1980

Mr. John F. Spencer, Assistant Director
Office of Water Programs
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Dear Mr. Spencer:

The Department of Game is pleased that the Green River Instream Resources Protection Program is being developed. The Green River is one of the most important streams in Washington; in 1978-79 the sport catch of winter-run steelhead was the second highest in the state, and the Green River, whose mouth is in Seattle, is the closest major stream to Washington's biggest population center. The recreational importance of the Green River will continue to increase as the fuel shortage places a greater premium on proximity to people. Several wetland areas in the lower Green River basin have been considered by the U.S. Fish & Wildlife Service under the Unique and Nationally Significant Wildlife Ecosystems Program. These important wildlife habitats, which have received attention from several concerned environmental groups and from The Evergreen State College, deserve protection, including maintenance of natural flows in the Green-Duwamish River. **192** **1** **193**

Because the Green River is so important, we request a revision of the winter and spring minimum flow. The minimum flow for this period, which corresponds with the time of steelhead spawning, has been set at 550 c.f.s. at Auburn, but we request that it be raised to 650 c.f.s. There is no technical difficulty with this request because 650 c.f.s. is generally available during this period according to hydrographs provided by the Department of Ecology. **194**

It is important to note that our request for a 650 c.f.s. spawning flow is already a compromise reached during informal discussions between the Departments of Game and Fisheries. The compromise was agreed to in order to avoid protecting steelhead at the expense of salmon or vice versa. Water stored during spring steelhead spawning period needs to be released during the fall salmon spawning period. High flows (800-900 c.f.s.) provide maximum spawnable area for steelhead, according to direct measurements of habitat parameters. Further reduction of flow during steelhead spawning in unacceptable to the Department of Game.

The curve relating spawnable area to flow in the Green River has a steep positive slope from 200 c.f.s. to about 550 c.f.s., and a gradual plateau of spawnable area at higher flows. Maximum spawnable area occurs at 900 c.f.s. Lack of precision in flow control and in measurements of spawnable area dictate

that caution be used in establishing flows. A flow of 550 c.f.s. is too close to the abrupt shoulder of the curve. In that region a slight decrease in flow could lead to a substantial decline in spawnable area for steelhead. Too much habitat is risked if the steelhead spawning flow is set at 550 c.f.s.

The summer minimum flow of 300 c.f.s. at Auburn is an important step in the protection of the Green River's steelhead run. The draft program document points out the importance of summer rearing flows for steelhead production. The Department of Game endorses the summer minimum flow established in the Green River Instream Resources Protection Program. **195**

We request that thresholds be established to govern decisions concerning critical years to (see p. 26 of draft document). We recommend that the Director of Ecology shall not allow flows below critical year flows unless natural Green River flows fall below one-in-one-hundred-year Green River flow frequency. Such a restriction is essential to protection of fish and wildlife in the Green River basin. **196**

It is apparent that there are many demands on the waters of the Green-Duwamish River. The Department of Game urges the Department of Ecology to assess existing and pending water rights and availability of water. The Department of Game endorses closure of tributaries to further consumptive appropriation. **197**

Sincerely,

THE DEPARTMENT OF GAME

Hal A. Beecher

Hal A. Beecher, Ph.D., Research Analyst 2
Habitat Management Division

HAB:mb

United States Department of Agriculture
Soil Conservation Service
Room 360 U. S. Courthouse
Spokane
Washington 99201

JAN 10 10 14 AM '80

January 7, 1980

John F. Spencer,
Assistant Director
Office of Water Programs
State Department of Ecology
MAIL STOP PV-11
Olympia, Washington 98504

Dear Mr. Spencer:

A copy of the Draft Green Duwamish River Basin Instream Resource Protection Program was recently sent to this office. Thank you for sending us a copy of the document.

In review of the draft, members of my staff have expressed some concern regarding irrigation needs in the basin.

Although the acreage irrigated is small and to supplement normal rainfall, some does occur. Most irrigation is performed during July and August when stream flow is lowest. **198**

Effects on present and potential irrigation needs should be considered when minimum flow levels are established. **199**

Sincerely,

Richard D. Bates, Acting

LYNN A. BROWN
State Conservationist

cc: Warren Lee, Area Conservationist, SCS, Bellevue, Washington

STATE OF
Washington
Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION
HIGHWAY ADMINISTRATION BUILDING Olympia, Washington 98504

January 10, 1980

Ms. Jeanne Holloman
Department of Ecology PV 11
Olympia, Washington 98504

Department of Ecology
Green-Duwamish River Basin
Instream Resources Protection Program
Draft Environmental Impact Statement

Dear Ms. Holloman:

We have reviewed the subject document and have no comments to offer regarding the proposal.

Thank you for the opportunity to review this information. **200**

Sincerely,

ROBERT S. NIELSEN
Assistant Secretary for Public
Transportation and Planning

Don Jay Thipne
for By: WILLIAM P. ALBOHN
Environmental Planner

RSN:fih
WPA/WBH

cc: J. D. Zirkle/T. R. Burke
R. Albert
Environmental Section

5529 27th Avene N.E.
Seattle, Wa. 98105
January 30, 1980

Department of Ecology
Office of Water Programs
Attentions Hearing Officer
Olympia,WA. 98504

Subject: Green-Duwamish River Basin Instream Resources Protection

Comments:

As a member of the Washington Environmental Council, I find the proposal as stated in the Draft EIS a satisfactory set of rules to establish instream flows on the Green River (Water Resources Inventory Program Area 9).1 **201**

Notable among the proposals that are environmentally sensitive is the fish protection program. The 1967 and 1969 experimental reports are particularly enlightening. Stream habitat improvement by Metro cooperation should improve the feeder streams. It is a hopeful sign that success, that fish return, will come with stream rehabilitation, **202**

In regard to the water supply for Tacoma, the existing closures should be retained rather than cause another city to abandon natural, clean water. Neither the United States Forest Service nor the State should open the lands to recreation. We have appropriated enough natural resources land for man's use without regard to the needs of wildlife, fish and plants. **203**

The Department of Ecology proposal is sensible.

Sincerely,

Faye Ogilvie

Faye Ogilvie

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Environmental & Technical Services Division
P.O. Box 4332, Portland, OR 97208

January 29, 1980 FEB 1 0 25

Department of Ecology
Attention: Hearing Officer
Olympia, Washington 98504

Dear Sir:

We have reviewed the proposed Green-Duwamish River Basin Instream Resources Protection Program.

We note that the proposed flow at Auburn is increased to the wintertime 550 cfs level beginning with 350 cfs on October 15. This increase appears to be just after the peak of chinook spawning which is stated to be between September 25 and October 10 (page 6 of the Draft Supplement Environmental Impact Statement). We believe that an earlier increase in flow, arranged to match the period of peak spawning, may substantially enhance spawning success and thereby gain a greater benefit to the fish resource. **204**

We appreciate the opportunity to comment on the proposed Green-Duwamish Instream Protection Program.

Sincerely yours,

Dale R. Evans

Dale R. Evans
Division Chief

Vancouver Wildlife League

P.O. Box 1662

Vancouver, Washington

Vancouver, WA
2 February, 1980

Department of Ecology
Olympia, WA 98504
Attn. Hearing Officer:

Dear Sir:

Please be advised the Vancouver Wildlife Organization does support the recommendations for minimum flows (both summer and winter) and the instream flows as proposed by the Washington Department of Game for the Green-Duwamish River system. **205**

We respectively request this testimony be made a part of the record.

Sincerely
Larry Workema
Larry Workema- Pres.

Vancouver Wildlife

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Mt. Baker-Snoqualmie National Forest
1601 Second Avenue Building
Seattle, Washington 98101

REPLY TO: 1950 Review of Other Agency's Environmental Impact Statements

SUBJECT: Instream *Resources* Protection Program
Green-Duwamish River Basin

TO: Department of Ecology
Attention: Hearing Officer
Olympia, WA 98504

We have reviewed the draft environmental impact statement for the Green-Duwamish River Basin and have no comments at this time. **206**

Thank you for the opportunity to review this document.

DON R. CAMPBELL
Forest Supervisor

4508 N. Cheyenne
Tacoma, WA 98507
February 13, 1980

Department of Ecology
Attention: Hearing Officer
Olympia, WA 98504

Dear Sir:

I am writing to you in regards to the establishment of instream flows on the Green River. The Pierce County Sportsmens' Council would like to go on record as totally supporting the recommendations of the Washington State Department of Fisheries. **207**

Our major concern is that there will be adequate stream flow for the returning Chinook Salmon. If these means that the stream flow must be increased to fully protect these spawning fish then we strongly urge that it be done. It would truly be a great loss if we did not do everything possible to protect this very valuable natural resource. **208**

Sincerely,
James F. McAfee
James F. McAfee

cc: Ray Johnson, Dept. of Fisheries.

Green River Community College
12401 S.E. 320th St.
Auburn, Washington 98002
Auburn: (206) 833-9111
Seattle: (206) 464-6133

FEB 13 10 02 AM '80

February 11, 1980

Department of Ecology
Hearing Officer
Olympia, WA 98504

TO WHOM IT MAY CONCERN:

Please record this letter as part of the recent public hearing (February 7, 1980, Auburn, Washington) on the Green-Duwamish River Basin Instream Resources Protection Program.

I have for several years followed closely the problems associated with the Green River, and believe it is very necessary that state and federal agencies carefully monitor and control the flow of water in this stream.

I strongly support any future plans that will provide for an adequate year around water flow that insures protection of fish habitat. Migratory fish will continue to have more problems in carrying out their life cycles in the Green. Additional fishing pressures and pollution are just two examples. Let us not compound these problems by not providing the proper instream flow. **209**

I commend your organization for the work that went into the document.

Thank you.

Yours truly,
L. Dennis White
L. Dennis White, Instructor
Biology Department

APPENDIX D

Responses to Comments

Responses are keyed by numbers which appear on the comment letters.

Responses to City of Tacoma

Note: The City of Tacoma submitted a large volume of information at the public hearing. The record contains written testimony by John Roller and Chuck Howard and Associates. We are unable to republish this information in its entirety due to its considerable length. It has been thoroughly reviewed and the department's responses are categorized below. The responses represent major areas of inquiry concerning the Green River program, and serve to answer many of the other comments received during the official comment period. Tacoma has submitted additional written comments to the record that are displayed in Appendix C. Copies of all comments by the City of Tacoma are available from the department.

1. Economic Impacts

The Department of Ecology (DOE) considered the long-term economic impacts of the Western Washington Instream Resources Protection Program in the overall programmatic environmental impact statement (published June, 1979; copies available from DOE, Olympia, WA 98504). The legislative mandate to provide for the preservation of instream resources [RCW 90.54(b)(2)] is not intended to be judged in economic values. The provision of instream flows is valued above all potential use of the public waters of the state. The overall programmatic EIS indicated areas of potential adverse economic impacts related to the setting of instream flows. Long-range and indirect impacts are not expected to result in any loss of employment opportunities or cause population shifts within regions of the state.

Direct impacts of the flows-setting program are described in the accompanying supplemental EIS (Appendix C). The adverse economic impacts are confined to the cost of municipal and industrial water supply. DOE recognizes the relationships between instream flows and the potential water supply yields developed under future water rights conditioned with instream flow provisions. DOE regularly coordinated the development of the instream flows for the Green River with the City of Tacoma. Technical exchange has continued throughout the planning period.

The Department does not set instream flows for out-of-stream uses, but is sensitive to those impacts.

DOE relies on water supply yield information to be supplied by project proponents. Assessment of water supply development costs proceeds if the relevant data is provided in the planning period. DOE looks to the City of Tacoma's Report, Green River Water Supply Capabilities (Draft, February, 1980) for detailed yield analysis. Given the exact yields, DOE could indicate what impact the instream flow may have on system reliability, costs for additional storage facilities, and other water supply development costs. The final EIS, Snohomish River Basin Instream Resources Protection Program (DOE, June, 1979) is an example of assessment of direct adverse economic impacts to water supply.

The City of Tacoma has impact assessment responsibilities the same as DOE under the State Environmental Policy Act (SEPA) and is required to develop a comprehensive

water supply plan prior to approval of system improvements by the Department of Social and Health Services (DSHS). Both the comprehensive plan and EIS, and the EIS for Pipeline No. 5 will contain information of an economic nature. Tacoma's water system development planning is at an interim state and will utilize the results of the instream flow program to develop final plan configurations and project feasibility studies. DOE believes impact of the flows program will not seriously limit the availability of suitable municipal and industrial water supply or preclude implementation of Tacoma's proposed development plans.

2. Program Development

Because of the compressed timeframe of the overall Western Washington Instream Resources Protection Program, the department has requested the assistance of many local state and federal entities and various interested individuals in developing the instream flows program. The City of Tacoma has provided significant assistance throughout the Green River program, and has made many valuable contributions to the overall development of the Green-Duwamish Instream Resources Protection Program.

3. Supplemental Data

At the City of Tacoma's recommendation and expense, considerable additional input has been provided. The work accomplished by their consultant has improved the technical basis for decisions. The results of the analysis were available in draft form prior to the February 7 public hearing, and presented publicly at that date. That effort comprises the majority of the City of Tacoma's testimony. The workshop session held March 10, 11, 12 at the Public Utilities Building in Tacoma was an opportunity for all major affected parties to fully present their views on the proposed instream flows. Considerable time was offered to Tacoma to make a complete description of their findings concerning water resources management of the Green River. The department considered all viewpoints in developing the flows program. The proposed administrative rules were carefully analyzed and recommendations for clarification were encouraged. These sources of technical input are drawn upon in the development of the final regulation.

4. Priority to Instream Uses

The department has stated a determination to follow the mandates of the Water Resources Act of 1971 and provide for the preservation of flows for instream resources. This is recognized to be a narrow objective in the context of the broad nature of the act, which guides all aspects of water resource management at the state level. The importance of maintaining instream flows is fundamental to the purposes of the act. No greater force could be given to their importance than to consider the setting of the flow singularly and in advance of any other water resource allocation process authorized under state law.

The department is following its duty as water resource manager for the state, and implementing the tenents of the Water Resources Act of 1971 by setting instream flows. Adequate and safe supplies of waters for public use will be available and protected by the

state water resource uses is not an expressed purpose of the Western Washington Instream Resources Protection Program, and would not materially affect the result.

Although rights are not necessarily established in this regulation, it does place restraints on the availability of supplies. These same limits would be placed on any new water right permit being processed by DOE. WWIRPP is a systematic, basin wide approach to conditioning future water rights, which may precede the development of a total basin plan. Tacoma water supply needs are considered in respect to demands on any waters that would exist above the flow levels set in the proposed regulation.

5. Five Year Review

The department is proceeding with the setting of instream flows with the confidence that the flows set will remain as established. The intent of the program is to set a foundation of instream flows, above which future allocations can be made. The department understands the need of major affected water users to plan future improvements with firm constraints built into their planning program. Limitations imposed by the proposed regulation are intended to be permanent. Flexibility in rule-making is provided by the five year review period, which allows reassessment of management capability and technical completeness.

6. Ground Water

Full utilization of ground water resources, for peak and sustained supplies, should be considered in water supply plans. The department has gathered considerable information regarding ground water availability in Central Puget Sound, in part, from the process of setting instream flows. It is clear that the population pressure in many areas has already utilized the available ground water supplies, particularly where the sources are shallow acquifers. DOE supports further investigation of ground water sources towards a maximization of its use.

7. Increased Probability of Turbid Water

Operational flexibilities currently exist in the operation plan of Howard A. Hanson Dam. The dumping of a quantity of spring runoff that is not stored due to the likelihood that later runoff will contain turbid waters, is possible under the Corps authorities. The Corps of Engineers has been able to delay filling the summer conservation pool until the problem period is passed. It is suggested by Tacoma that by having to obtain new storage rights, Tacoma will have to ask COE to store water earlier in the spring than under current operational procedures. The draft of the Green River Water Supply Capabilities report addresses this issue and presents the conclusion that the next increment of water supply can be developed without being impacted by turbidity. The City of Tacoma has begun investigation of off-stream storage for further supplies. Such a use could store turbidity-free waters during spring high flow periods, without being susceptible to degradation from other turbid flows.

8. South King County Water Supply

The department has been informed by the Water Division that preliminary studies indicated sufficient availability of water supply from the Green River, given the constraints placed upon the supply by the instream flows regulation. The decision on routing of Pipe- line 5 may be complicated by issues other than source selection or yield. King County must approve rights-of-way franchises for the pipeline route and accept Tacoma's Comprehensive Water Supply Plan. Agreements relating to purveyor contracts will play an important role in the granting of the franchise request.

The required analysis of alternative water supply source selection process for the proposed Tacoma service area is the responsibility of the City of Tacoma, a major water supply development proponent. Tacoma has joint responsibilities to the Department of Social and Health Services and DOE, to provide the necessary documentation of their source selections. There is currently no comprehensive water supply planning process other than Tacoma's underway for South King County and valley cities, unlike the rest of Central Puget Sound.

The possibility of the City of Seattle supplying water to this area has not been studied recently and there are indications that it is possible, but probably not feasible. Several valley cities are exploring their ground water potentials. Findings are not yet available.

Interim findings of the instream flows program indicate future supplies of municipal and industrial water supply will be available from the Green-Duwamish River Basin. By setting the instream flows at this time, the department may be accelerating the eventual allocation of public waters. If instead of pursuing the minimum flows program, the department were to complete a total basin plan and allocation scheme for the Green-Duwamish, a temporary moratorium would be required, suspending water rights actions till a later date. This might leave major affected water right holders and potential users in a more uncertain state regarding the instream resources requirements.

Tacoma has mentioned a shift in water supply cost and demand due to the instream flows program. This is unrealistic in a case where there is very little choice to be exercised by the ultimate users of the resource. The inelastic nature of the exclusive supply of water assures that the benefits of developing a new water supply source will always equate with costs. It seems unlikely for population growth in the Tacoma supply area to dissipate in the foreseeable future. The City of Tacoma should investigate ways to decrease future demand.

9. Yield Analysis

Preliminary findings will be confirmed in the final draft, Green River Water Supply Capabilities to be available in mid-April. As a background to yield analysis, it was reported by the Corps of Engineers, in the Joint Cedar-Sammish Water Supply Report (Water Supply Committee, June 1979) that there was a firm 83 million gal- Ions per day (MGD) from the Green River. Yields may differ with the constraints imposed by the regulation, but supplies appear sufficient for Pipeline 5.

The possibility of water filtration, though costly, would allow for the development of quite large yields for water supply. This would be a more efficient use of the water resources. The department recommends that Tacoma fully investigate this option in its comprehensive planning and detailed feasibility analysis.

The City of Tacoma has developed rough estimates of additional storage required to supply the firm yield requirements of Pipelines. These tentative findings will be finally determined in the water supply report, and all assumptions checked.

The workshop held on March 10-12 provided an opportunity to fully discuss the studies that have been developed in the course of DOE instream program. Water supply yield, in particular, is an area that required additional information before preliminary conclusions could be drawn. Tacoma's consultant, Charles Howard, indicated that he was satisfied that the parameters have been adequately defined, and he could proceed with the yield analysis. Those preliminary findings should be available early in April. Further analysis will be included in Tacoma's Pipeline 5 EIS and the Comprehensive Water Supply Plan and its EIS. Ecology's instream flows program is a basic constraint on these programs, and must precede their development.

10. Management of Instream Flows

The department's proposal has been developed under specific authorities that do not abridge existing rights or federal reserved rights. The authority of the State of Washington to set- instream flows is limited in relation to the operation of the Corps of Engineer's Howard A. Hanson Dam. The instream flows are principally intended to be conditions on future water rights, appropriated under the state water rights code. The state does not intend the proposed rules to govern the operation of Howard A. Hanson Dam and therefore is not in conflict with existing federal programs. The instream flows are not a minimum release curve, or a requirement on future storage in the reservoir. The existing COE conservation pool release schedule will remain as presently authorized at a commitment to provide 110 cfs. Excess inflow above the instream flows established in the proposed rules may be available for allocation under future water rights. The Corps may require waters for filling or maintaining the conservation pool and would on occasion utilize inflows that would have provided for the flows established in the regulation. The Corps right to use inflow is superior to the state instream flows.

The City of Tacoma has commented regarding increasing storage to satisfy the instream flows. The flows established in the regulation will not be provided on a guaranteed basis from storage. All other minimum or instream flows set by the state share this characteristic. Tacoma will not be required to supplement natural stream flows when those flows fall below the levels established in the proposed regulation. Tacoma will be required to cease direct diversions, under future water rights during those periods. Municipal and industrial water supplies would be required to continue from storage specifically developed for that purpose. The existing rights that Tacoma may have would not be affected by the proposed rules.

The instream flow hydrograph is not a minimum release rule curve, but a condition on future water rights, causing diversions to cease when flows drop below the levels established in this program. The storage requirement cited as required to meet the instream flows is not proposed by this program, but may equal the amount of storage required to guarantee, 100 percent of the time, the normal year instream flow. The department does not have the authority to request the provision of this supplemental storage from either major affected water right holders or the Corps of Engineers. A request of that nature would constitute enhancement of the resource and exceed the dictates of the Water Resources Act of 1971. This area was discussed at the workshop. The Corps representative stated that there is flexibility in their operations. Sometimes there is surplus inflow into the dam during summer and fall periods. This inflow can be used by the Corps to keep the conservation pool at a maximum high level Corps and beneficially release the storage later in the fall low flow period. Also, the excess runoff can be released as it occurs (given an adequate conservation pool), to provide the instream increment of 40 cfs (difference between Corps authorization and DOE instream flows). Water above the instream flows may be available for appropriation.

11. Standard Operating Procedures

The department administratively implements portions of the water resources management program (Chapter 173-500 WAC) through the development of standard operating procedures. They provide detailed guidelines for departmental resource management personnel engaged in operations in the field. These guidelines will be extremely important during water scarce years when user pressures may force tough decisions upon the resource managers. In a drought situation, a critical year condition may be declared, during which time some diversions may be allowed that would not normally be permitted. The standard operating procedures will condition future water right permits.

The proposed rules provide for normal and critical year water resource management. Under normal conditions flows would provide for instream resource protection and additional water rights authorizations. In marginal years the instream flows will be protected to the extent that diversions affected by this regulation would not be allowed to lower the flows below the level established in the pro- posed rules. In a critical year, a sharing of the burden between instream and out-of-stream uses may be permitted. Even if new water rights can provide for their demands through storage in dry periods, the instream flows may naturally fall below the indicated levels.

The workshop provided a broad exchange of ideas and information from which the guidelines will be developed. This was accomplished in part by carefully considering the proposed administrative rules, section by section, discussing in detail certain aspects of the regulation. These sections received special attention, which resulted in clarifying language being put into the regulation. These modifications served to further refine the actions being taken by the department at this time, and provide a basis for judging the requirements of the standard operating procedures.

12. Water Rights

What rights Tacoma may already have under the use of their existing pipeline would be for natural flows and are unaffected by the regulation. Pending applications for appropriations would be conditioned to limit diversions to direct use or storage during periods when instream flows meet or exceed levels established in RCW 173-509-020(2)(b). Permits will be issued on the main stem Green River only and will be for diversionary use and storage. Purchase of reservoir lands prior to construction of Howard A. Hanson Dam would probably not result in confirmed rights claimed under the riparian doctrine.

The City of Tacoma has filed a water right claim for a quantity of water from the Green River. This does not constitute a historical right. Rights developed from claims are confirmed only by court action, and a general adjudication of the Green River has not been requested or scheduled.

The intention of the City of Tacoma to pursue additional rights to natural flow and storage was communicated to Ecology by letter. Tacoma requested the department to begin processing a pending application for an additional 100 cfs from the Green River, with a priority date of 1933.

13. Water Quality Objectives

The department does not intend to justify the entire instream flows program, based on the single criterion of water quality. Water quality maintenance is a state goal, as reflected in the Water Resources Act of 1971 and the water pollution control program. The instream flows program, by protecting certain quantities of stream flow from further allocation, is bolstering the anti -degradation requirements of the Clean Water Act. Technical studies of the existing water quality in the Lower Green-Duwamish River have recently been completed by DOE. The findings confirm statements made in the document regarding the chemical and biological characteristics of the lower river. Metro has indicated that their facilities planning process does not depend on the outcome of the instream flows program.

14. Historical Minimum Flows

Extreme low flows have been all but eliminated by the operation of Howard A. Hanson Dam. Very low flows would be expected even under pristine natural conditions. Fisheries and Game refer to better water years, that would have provided substantially

greater flows than are now regulated to a relatively stable, 110 cfs fisheries conservation discharge from Hanson Dam. The expectation that under natural conditions flows during the summer low flow period will be substantially higher (and periodically lower) than the Corps authorization forms the basis of Fisheries and Game's requests for higher flows from Hanson Dam.

15. Open Watershed

The Green-Duwamish Instream Resources Protection Program will have no impact on this issue.

16. Fall Reservoir Operations

Fisheries and Game are concerned that the flows from Hanson Dam not increase too early in the fall, if there is either an indication that conservation pool storage or anticipated fall runoff will be insufficient, and flows necessarily return to lower levels. This could result in the stranding of the eggs in the gravel.

Fisheries and Game sometimes requests higher flows for short periods to facilitate the arrival of the fall spawning salmon. This is done with the knowledge that use of the stored waters for this purpose could jeopardize to commitment to supply the authorized 110 cfs into the fall.

The mathematical discharge-fish arrival model presented by the City of Tacoma does not provide for rearing flows or requirements. The rate of change of discharge would be constant in respect to time, since fish arrival in the Green River is known to be relatively fixed. This relationship has been confirmed by Fisheries and Game. The flow requirements of spawning and incubation are very close to the same. Tower counts of fish arrivals on the Green River are not available, and are probably not possible due to the murky water in the Duwamish River.

Tacoma's contention that the Fisheries requirements for salmon are not well known is unsubstantiated. Puget Sound and Columbia River tributaries fisheries constraints are very similar.

17. Supplemental Environmental Impact Statement

The purposes of SEPA are broad in scope for a programmatic action such as the Green-Duwamish Instream Resource Protection Program. SEPA does not specifically indicate the required analysis. Ecology has published similar programmatic EIS's for basin programs, the overall WWIRPP program and the Columbia River Instream Resources Protection Program. The supplemental environmental impact statement provides information specific to the Green-Duwamish River Basin, particularly in the areas of fisheries and municipal water supply.

The City of Tacoma should provide whatever data it has available on its proposed development of future water supply, as required under SEPA. We have assessed the impacts of our program on these proposals in a broad manner only, since no specific

information regarding any aspect of potential Tacoma projects has been made available. Without information on definite yields, storage requirements and service area options, Ecology is unable to specify in quantities of water and in dollar increments the exact impact of the proposed administrative rules on the City of Tacoma's plans. Ecology has indicated the legal relationships and mandatory requirements Tacoma must observe should it seek additional municipal and industrial water supply from the Green River.

The natural constraints to spring runoff accumulation appear to be the primary consideration in developing additional water supply. The direct costs attributable to the instream flows program are confined to the cost of water supply storage. Some storage may have been required for Pipeline 5 without a state program to protect instream resources. The burden placed on major affected water rights holders due to the program is equal to the value of storage required to supply firm yields during summer low flow period when it is probable that no new direct diversions would be allowed.

18. Artificial Propagation

The overall programmatic EIS for WWIRPP considers alternatives to natural-based fish production. Hatchery programs are considered of lesser priority by the Department of Game, than natural production. Artificial propagation is extremely expensive, requires intensive management and does not retain "wild" species characteristics.

19. Instream Flows Methodology

Our methodology is intended as a "first cut" analysis of instream resource needs, based on the historical streamflow. It provides a slightly different perspective than the other habitat based methodologies also assessed in the program.

Study team consultations resulted in the proposed flow sets. During the process, Ecology presented their preferred flows and Fisheries and Game theirs. Each state agency justifies their flows based on their methods of analysis. Ecology is, in the most part, concerned with the frequency with which flows occur. The departments of Fisheries and Game base their judgment of flow suitability on the degree to which spawnable area and rearing area is provided by the flows. Since Ecology's frequency-based levels can easily be converted to the percent of spawnable area, the different flows can be readily compared.

The authorizing statutes for the Western Washington Instream Resources Protection Program is RCW 90.54.020(3)(a) (Water Resources Act of 1971). It clearly states that "perennial rivers and streams of the state shall be retained with base flows necessary for the preservation of wildlife, fish, scenic, aesthetic and other environmental values and navigational values." These objectives are distinguished from the beneficial uses of water as identified in RCW 90-54.020(l), which refers to hydropower, industrial, commercial, agricultural, and other uses. The allocation of waters among these potential uses and users shall be based generally on the securing of net benefits for the people of the state. The allocative process of water rights appropriations is not considered to have the primary status of the preservation of values related to the setting of base flows.

The study team selection was predicated upon the values mandated for protection of instream flows. The Western Washington Instream Resources Protection Program has coordinated most actions with the impacted users groups. Of these groups, all significant concerns that have been brought forward have been considered in designing the program. We cite the availability of critical year flow pro- visions on streams with major water resource developments. We feel this represents a high degree of sensitivity within our program.

20. Alleged Damage from Instream Flows

There is no justification of the comment that severe damage to the fishery could occur, by providing for instream flows. This has been a cornerstone of the City of Tacoma's comments to the draft proposal. This statement is in error and represents a misunder- standing and a wrongful reinterpretation of the proposed rules by Tacoma. Verbal and written communications to Tacoma have warned them of this serious misconception.

Tacoma has perceived the instream flows hydrograph (WAC 173--509-030) as a formal rule curve which must be adhered to by project operators. In this instance the operator is the Corps of Engineers and the subject facility is Howard A. Hanson Dam. As Tacoma viewed the regulation, the Corps or Tacoma (or any other resource manager) would have to meet the instream flows, through releases of storage. In other words, before Tacoma could use a future water right, it would have to provide stored water to keep the stream flow at the level specified in the proposed rules.

As explained in Response 10, Management of Instream Flows, the in- stream flows are not a mandated rule curve to be followed by COE. They will govern the availability of water for diversion to direct use or storage. Once legally stored, the water would be the property of the City of Tacoma to be used in their judgment and in con- sort with contractual agreements developed between themselves and the Corps. Those waters would not be called upon to augment stream flows. The existing Corps conservation pool would be used as authorized and not exhausted in the manner that Tacoma suggested.

The department would like to see the use of Corps storage to support spawning flows in the fall, but not in the context of mitigating alleged damage from the instream flows. The fall operation should prolong storage as long as possible. This could be accomplished through the existing Corps authorization, by releasing the remaining conservation pool in a controlled gradual manner to increase the flows to spawning levels.

21. Economic Trade-offs

The department does not feel bound to provide an economic analysis of the relationship between instream resource values protected in this program and potential adversely impacted uses of the waters. The Water Resources Act of 1971 distinguishes between instream values to be preserved and allocations to beneficial uses. Should this program establish rights to potential uses, it would be bound by both the 1971 Act and SEPA to provide information concerning the relative trade-offs between beneficial and adverse impacts. We are not willing to compare "fish dollars" and other nonmonetary benefits to

the value of water in municipal- industrial use, or other uses. This would be contrary to the intent of state law. We have been sensitive to out-of-stream users of water in detailing these proposed administrative rules, by providing mitigative measures and sufficient remaining waters to be allocated in further phases of the program. The purposes are not in conflict. The adequate protection of stream flows is considered fundamental to all water resources and fisheries management.

22. Palmer Gage Inaccurate

The department will take under advisement the recommendation from Tacoma's consultant that the Palmer Gage has recently shown an extremely variable rating curve. It seems probable that another location may have to be developed for accuracy or managerial control. Provision has been made in the proposed rules, allowing such a shift in control location, should it be necessary.

The inaccuracies in the Palmer Gage are of a recent origin and will be masked by the 42 year period of record used to develop the hydro- logic background to the instream flows.

23. Single Station Management

Tacoma misinterpreted the proposed rules to indicate that both gages, Auburn and Palmer, would be used to condition their future permits. The problem was discussed at the workshop. More explicit language has been developed in the proposed rules to eliminate any further misinterpretation. New diversions upstream from the Palmer Gage will only be regulated by that stream management control location. Only the Palmer Gage will be supplied with a critical year curve, which will be used to mitigate impacts of severe drought conditions on water supply storage facilities.

The instream flows set for Palmer and Auburn gages account for the variability of runoff between the gages at different times of the year. This should not pose a water resource management problem since future rights will be conditioned at one control location only.

24. Critical Year Determination

One of the major considerations in the March 10-12 workshop was the criteria and procedures that would be used to make the declaration of a critical year. This is considered very important from the department's resource managers as well as the major affected water users. The signals suggested in the comment have been included in a method of forecasting an approaching dry spell that is now a part of the proposed rules [WAC 173-509-030 (2) (b)].

It is recognized that stream flow alone is not an adequate prediction of an approaching dry spell. The contents of the Howard A. Hanson reservoir were known to be an indicator of water availability, since the Corps guidelines for operation, if properly followed, would provide sufficient conservation releases to maintain the cur- rent authorization of 110 cfs throughout a fall dry spell. A new water right holder with provisions to store municipal and industrial water in the reservoir, could predict shortages based on the early summer runoff period. The storage pool would be observed by project proponents in the late summer to estimate available supplies for the early fall. Other predictive methods would be also used at that time. Utilizing gaged information from unregulated tributaries might be worthwhile in making a determination of critical year. Inflow into the dam can be determined through discharge from the dam and changes in pool elevation.

If fall runoff conditions and predictions indicate a water shortage, exceptions to the normal year instream flow may be allowed. Such a deviation would only be allowed after the director has consulted with the departments of Fisheries and Game. Efforts by the major affect water users to curtail demand during this period would be expected and closely observed by the director.

25. Runoff-Storage Alternative

The City of Tacoma's consultant has put forth a recommended management scheme based on availability of runoff and storage. This is proposed in lieu of the "strawman" alternative of "rigidly, adhering to an abstract curve." The department believes agreement has been reached between all parties that the proposed rules do not impose a rigid, deterministic minimum release schedule on the river management. The recommendation of a runoff-storage alternative closely resembles the department's proposed rules. The out-of-stream uses of water would be subject to the observed runoff. Provision of storage would allow municipal and industrial water supply diversions to continue when adequate runoff would not be available. The existing Corps conservation fishery pool would provide protection for the instream resources to the extent currently authorized.

26. Arrival of Spawning Salmon Escapement

Information offered by Tacoma's consultant confirms Fisheries testimony that the return of spawning salmon to the Green River is regularly predictable.

27. Fall Fisheries Flows

The most difficult management problem from the standpoint of the salmon fishery of the Green River is the provision of adequate flows for spawning in the fall, from a combination of natural runoff and Corps conservation releases. During years when the initiation of fall runoff coincides with fish arrival little manipulation of flows would be necessary. In dry spells the Corps is relied upon to stimulate arrival of the fish by providing one or two days of higher flows, normally around mid-September.

Following stimulation of the escaping salmon during a dry fall, a period of intense concern will follow, requiring careful management of the resource. Without expectation of fall rains, the remaining Corps' conservation pool has to be utilized to create suitable spawning flows. This can be accomplished by gradually releasing the stores of water. The Corps normally must evacuate the reservoir to prepare for the fall flood period, although they can prolong the eventual emptying till later in the year. Prediction of available storage earlier in the fall can prevent releasing the flows too soon. Additional concern on the Corps part to maximize conservation storage throughout the summer can also decrease the probability of shortages in the fall.

Prediction of fall runoff is a problem that was discussed at the workshop and the department has included procedures in the proposed regulation that will assist decision-making during that period.

28. Future Studies

Provided additional resource management studies or activities are not in conflict with the proposed chapter, they will be a valued contribution. The rules are also required to be reviewed within each five year period.

29. USGS Methodology

By consulting with the fisheries and game agencies, the department defers to their judgment of the adequacy of flow proposals. Ecology believes that their experience in the field significantly increases the value of the USGS methodology. Spawnable area and fisheries production are known to be related, while the exact correlation of the two may vary due to the behavior of other factors. Achieving the maximum spawning area would be desirable from the viewpoint of fisheries management alone. The department is responsible for the management of the state's public waters and intends to provide instream flows that preserve an optimum amount of spawnable area. By optimum it is meant an amount less than maximum spawnable area that represents the most beneficial results for the minimum requirements. At that level the fishery resource is protected and the most efficient management of the water resources is attained.

Note: The following responses (No. 30-84) are to specific questions in written comments submitted by the City of Tacoma during the official comment period. The responses are to comments beginning on page 1 of Appendix C. In many instances references are made to the foregoing responses.

30. See Response 1, Economic Impacts. Considerable water supply planning and analysis must be accomplished by the City of Tacoma before specific information can be developed regarding regional impact assessment. Along with firm yield analysis, the project proponents develop feasibility studies for improvements to the water supply. No quantification of costs can be computed till that detailed information has been made available. Ecology does not believe that the instream flows will preclude development of the Green River for further water supply.

31. All serious impacts, either economic or environmental, are considered in the final supplemental EIS. Impact analysis has been pursued throughout the review period.

32. The instream flows are conditions on future water rights, limiting when diversions can be made. There is no guarantee that the flow levels will be available. See Response 10, Management of Instream Flows.

33. See Response 4, Priority to Instream Uses. After setting instream flows, to protect instream uses, Ecology can proceed with allocation of what waters may remain available for out-of-stream uses.

34. See Response 12, Water Rights. The pending water right application of the City of Tacoma, for 100 cfs will be conditioned with the proposed instream flows.

35. Reauthorization of Howard A. Hanson Dam

A request such as this is outside the scope of this program. The department believes that instream flows of 150 cfs will protect the instream resources, if future rights are conditioned to these flows. In some years, the instream flows will not be available. These dry years can be accommodated by the fisheries resource if all other years will be adequately protected. A request to the Corps for reauthorization for a larger conservation pool, providing for enhancement of the fisheries resource has not come forth from any state agency as part of this instream flows program.

36. See Response 7, Increased Probability of Turbid Water. Tacoma's testimony is contradictory.

37. See the overall EIS for the Western Washington Instream Resources Protection Program (DOE, June, 1979).

38. A "rule curve" is used here to mean a required minimum release schedule or objective for a water resource development project. This should be contrasted to an instream flow or level, that is a naturally occurring flow which cannot be appropriated.

39. The department will process the pending applications of the City of Tacoma and several water districts in South King County following completion of the Green River Instream Resources Protection Program.

40. Water Rights Reservation

Chapter 173-509 WAC provides procedures relating to the reservation of water for future public water supply. Upon request from a petitioner the director may reserve public waters for the future supply of a particular geographic area, but not to a particular supplier. The reservation may be further suballocated to specific sections within the geographic area. A water reservation would be adopted through reopening Chapter 173-509 WAC.

41. Flexibility is assured by the provision of critical year flows during prolonged dry spells. The process of declaring a critical year has been discussed with all interested parties and has been recently added as a subsection of the proposed administrative rules. The exact procedures will be formalized in standard operating procedures to be followed in making decisions.

42. Storage Projects. Provision has been made in the proposed regulation to allow storage projects not in conflict with the proposed chapter [RCW 173-509-070(3)).

43. See Response 42, Storage projects.

44. The department has pursued a policy of attaining maximum use of ground water supplies, where available. The purposed regulation only concerns ground water withdrawals from shallow acquifers which could adversely affect streamflows.

45. See Response 10, Management of Instream Flows. The amount of storage needed to guarantee instream flows is only related to some appropriations that will not be allowed during the periods when flows have fallen below the levels established in the proposed regulation. These conditions would have been placed on the pending water right even if it had solely been processed separate and in advance of the instream flow program.

46. See the Overall EIS for the Western Washington Instream Resources Protection Program.

47. The department disagrees, but will consider any specific comment or suggestion regarding fisheries management of the Green River.

48. The Western Washington Instream Resources Protection Program implements portions of the Water Resource Management Program, Chapter 173-500 WAC.

49. The Green-Duwamish instream flow program is developed with the expectation that future water rights for M&I water supply would be authorized. In addition, such use would necessitate some storage of water supply in Howard A. Hanson Dam. The amount required may be very small or none at all for Pipeline 5.

50. An extreme low minimum streamflow would be less than 110 cfs, and most low period minimums would naturally be somewhat greater than 110 cfs. Under the natural runoff regime analyzed by the department, the instream flow minimum of 150 cfs would be exceeded two out of three years.

51. See Response 7, Increased probability of turbid waters.

52. The department rejects the suggestion in that it would violate the intent of the instream flows program. Provisions will be made to allow diversions under extreme emergencies.

53. See Response 4, Priority to instream uses.

54. Noted.

55. See Overall EIS, Western Washington Instream Resource Protection Program.

56. City of Tacoma's reference to "natural flows" is a generalized term and not interpretable as a specific recurrence level.

57. Temperature problems could be exacerbated by low, natural flows. The temperature problem is most likely caused by lack of stream- side shading. METRO has commented on this problem elsewhere in the final supplemental EIS.

58. The comment suggests that the department should set instream flows at the level of the worst years of record. This would result in severe long-term damage to the instream resources.

59. The secondary use of Howard A. Hanson Dam for- water supply purposes would be allowed only after the Secretary of the Army has determined appropriate fees to be charged the users. The project proponents are totally responsible for this cost.

60. Noted.

61. Noted.

62. See Response 16, Fall reservoir operations.

63. Noted.

64. No mention of balancing instream with out-of-stream uses is found in the Water Resources Act of 1971, particularly on an economic level. The act sets aside certain waters to be protected by establishing instream flows and sets up a method for allocating the remaining waters on the basis of maximum net benefits.

65. Storage facilities, particularly when they are located off-stream, are beneficial when used to store excess waters during high flow periods for later use in low flow periods. The Corps provides the fisheries conservation flow that mitigates widespread damage to the instream resources.

66. The Department of Fisheries and Game are administratively related to Ecology through the hydraulic review of water right applications. Their review is required under RCW 75.10.030.

67. The instream flows proposed by the department will be generally available 65 percent of the time in the low flow period, and 95 per- cent during high flows.

68. The history of Tacoma's diversion was supplied to DOE. A family of hydrographs was reconstructed using several gaging locations correlated to the existing Palmer site. The Corps storage releases were also deregulated to reconstitute the natural flows.

69. It is apparent that storage is already available for these purposes. Tacoma has taken steps to insure the utilization of existing storage

70. See Response 19, Alleged damage from instream flow. With the problems the department has had with other assumptions used by Tacoma's consultant, it is unclear whether the data can be verified.

71. The "administrative method" referred to is unclear. Under drought conditions the regulations may change. There is no requirement on the release of storage, only regulation of the diversion to storage.

72. The City of Tacoma's alternative flow recommendation was presented at the workshop as an alternative featuring a "preservation flow" of 110 cfs. This has been rejected by the department as denying instream uses any commitment of streamflow above the current Corps authorization.

73. See Response 1, Economic impacts, and Response 17, Supplemental environmental impact statement.

74. See Response 3, Supplemental data.

75. Any proposed diversion which would alter streamflows in the Green River will be governed by the administrative rules.

76. The draft EIS was incorrect in stating that the program would necessarily be implemented by requesting the Corps to change its operational plan. The program will be implemented instead through state water rights actions, setting limits on diversions. The analysis of instream resources requirements focuses concerns the state agencies have with flows in the Green River, but does not seek Corps action to guarantee their availability. Nor does it deny or limit the Fisheries and Game interests in reauthorization of Howard A. Hanson Dam.

77. The congressional authorization for Howard A. Hanson Dam specific- ally states the Corps has no contractual obligations to existing rights or uses. It does suggest that the construction of the dam should not infringe on any rights or uses that might exist.

78. Noted.

79. If the proposed changes in operation of Howard A. Hanson Dam are assumed to mean increased storage on Tacoma's part for maintenance of instream flows, the comments are inaccurate. Elsewhere Tacoma has indicated the certain availability of additional good quality drinking water.

80. See Response 11, Standard operating procedure.

81. Considerable information concerning the Green River fisheries has been utilized by the study team.

82. As Tacoma has noted, filtration will probably not be necessary. The cost for such a facility, would it be necessary, is the responsibility of the City of Tacoma.

83. See Responses 1, Economic impacts, and 8, South King County water supply.

84. The workshop provided an opportunity to analyze a number of different scenarios. The department is not responsible for any changes of operation of Howard A. Hanson Dam as a result of the Green River Instream Resources Protection Program. Storage costs for Tacoma's water supply are the financial responsibility of the City of Tacoma and must be negotiated with the Corps.

Responses to Muckleshoot Indian Tribe

85. The Muckleshoot Indian Tribe's position regarding the ultimate disposition of their rights is recognized. The department invited the participation of the Muckleshoot Tribal representatives in the study team deliberations. This provided the tribe direct exposure and input into the flows setting process.

86. See Responses 4, Priority to instream uses, and 19, Instream flows methodology. Consideration is given to out-of-stream users, such as municipal and industrial water supply, as required in the State Environmental Policy Act (SEPA), but is not instrumental in setting the flows.

87. Habitat preservation is a basic purpose of the Western Washington Instream Resources Protection Program.

88. See Response 26, Fall spawning flows. WDF determined that 800 cfs was very near a maximum amount of spawning habitat. Flows above that level could actually decrease the spawnable area. Optimum spawnable area is viewed by the department as a level somewhat less than the maximum amount that delivers nearly the maximum spawnable area at a lesser flow. This is normally determined from analysis of the curve showing the relationship of spawnable area to flow levels. The optimum flow is the point of inflection where the rate of change to spawnable area decreases in relation to higher flows. The proposed fall spawning flows for the Green River (650 cfs) are higher than the inflection point flows (see Figure 1, Cumulative Spawning Area - Green River in EIS section). The proposed flows provide a margin of safety above the most efficient flow level. Consultation with WDF showed that there was no biological reason to go to a spawning flow of 800 cfs.

89. Both recommendations were discussed at length in the study team deliberations. It was stated by the Game representative that steelhead will emerge out of incubation by July I and will be safe from stranding. The fall flows cannot be depended upon more than 50 percent of the time. The rising limb of the proposed instream flows begins upward at mid-September and coincides with the expected arrival of spawning salmon between September 25 and October 10.

90. See Response 34, Reauthorization of Howard A. Hanson Dam.

Responses to Washington State Association of Water Districts

91. The proposed regulation affects ground water only if it is hydraulic continuity with the affected streams. This is to insure that the flows and levels established in the regulations will not be adversely affected by shallow withdrawals of ground water. Deeper sources which are increasingly being turned to, would probably display no affect on streamflow.

92. Analysis of alternative sources of supply is the responsibility of the water districts or municipal suppliers under WAC 248-54-580, found in the Rules and Regulations of the State Board of Health Regarding Water Systems.

93. See Response 4, Priority to instream uses.

94. A stable, commitment of streamflow is the fundamental basis for the state water resources and fisheries management programs. Other aspects of habitat management are closely tied to adequate provision of streamflow.

95. See Response 14, Historical minimum flows.

96. See Response 17, Supplemental environmental impact statement.

97. Provisions in the proposed regulation may allow diversions below the normal year curve, if continued drought conditions would jeopardize adequate water supply. Major municipal supplies would have to provide storage to continue supply during summer low flow periods when the direct diversions allowed will be normally less than during the high flow periods.

98. The regulation will be implemented through the water rights actions of the department. Authorizations will be guided by standard operating procedures which are currently under development.

99. Noted.

Responses to Metro

100. Flow augmentation could accomplish an improvement in water quality. This is an authorized secondary use of Howard A. Hanson Dam, anticipated in the original congressional document. Water right applications were filed in 1968 by the Water Pollution Control Agency (now DOE) for 110 cfs for the purpose of water pollution abatement.

101. Tree plantings seem to be an acceptable solution to the temperature problem. Other studies, principally the flood control study of the Corps may impact this alternative adversely. King County has identified in the River of Green Study setback levees as the preferred structural flood control improvement project. This may not be compatible with tree planting at the streamside.

102. Noted. It is unclear if the adverse temperature and dissolved oxygen problem, both current and predicted, require the total allocation of 550 cfs. The department is interested in the effect on water quality of protecting 300 cfs, in conjunction with nonpoint source control and tree shading.

103. The instream flows protection program is a foundation of the state and areawide water quality planning program. It supports the anti- degradation requirements of state water quality planning, by con- straining consumptive uses.

Considering the fact that the instream flows do not affect existing rights or create water that is not naturally available, there are limits to the beneficial effect of the instream flows program.

104. The recommended flows are significantly above (graphically) the 50 percent exceedence line, a common measure of reliability in the instream resources protection program. The flows would only be supplied on a regular basis by augmentation.

105. See Response 34, Reauthorization of Howard A. Hanson Dam.

106. The instream flows program extends downstream to the extent of the tidal influence. In that region the measurement and control of instream flows becomes increasingly difficult.

107. Noted.

108. It is unclear what the comment indicates. Water quality trends would stabilize and even improve with the protection of instream flows and point and nonpoint source abatement.

109. Noted.

Responses to Seattle Water Department

110. See Response 19, Instream flows methodology.

111. The Green River fisheries requirements are partially based on actual observation and field analysis conducted by Fisheries and Game. In addition, the relationship of discharge to spawnable areas was consulted, and is published in the final supplemental EIS (Appendix B). The spawning flows proposed for adoption achieve greater than 95 per- cent attainment of spawnable area.

112. See final supplemental EIS (Appendix B).

113 See Response 17, Supplemental environmental impact statement.

113. See Response 8, South King County water supply.

115. The department believes there are additional safe water supplies available from the Green River. They will probably require the use of storage to deliver a firm yield throughout the summer low flow period. Howard A. Hanson Dam can provide the required storage.

Other future storage projects may be permitted if they are not in conflict with the proposed regulation. This chapter does not preclude the further use of ground water supplies as an alternative source of water supply.

116. See Response 20, Economic trade-offs.

117. See Response 4, Priority of instream uses.

118. The department has stated many times, including the recent workshop, that only flows that recur a high percentage of the time will be established under the instream flows program. The methodology used by Ecology to develop the rough cut, hydrologic base flow converts a rating system into specific recurrence level. The Green River is rated very highly, and is provided with instream flows for the low flow period with a recurrence interval of 63 percent. This means that one out of three years there will be periods when the instream flows will not be present and affected water rights will be regulated. Higher instream flow (with a lower recurrence level) are not established by the instream flows program, and are considered enhancement flows requiring specific delegation of storage in order to be attained with any regularity. As a guideline, the department will not establish flows for any time of the year that approach the 50 percent recurrence level.

119. A thorough basin study and water allocation scheme would cause a moratorium to be placed on water rights actions. That might have serious impacts on the planning process of major affected water users. By setting instream flows at this time, the department can proceed with the processing of pending applications.

Responses to Puyallup Chapter N.W. Steelheaders

120. Alternatives to water supply source decisions must be covered by the City of Tacoma, in the Comprehensive Water Supply plan and the EIS for Pipeline 5.

121. Tributaries to the Green River are proposed for closure.

Responses to Department of Fisheries

122. Noted.

123. Noted.

124. Noted.

125. Limits placed on juvenile salmon rearing in the lower Duwamish River is a serious problem. The instream flows program is not specifically designed to affect water quality in the tidal influence. The department believes other water quality management activities will be supported by the protection of streamflows through the instream flows program.

126. Noted.

127. See Responses 34, Reauthorization of Howard A. Hanson Dam and 16, Fall reservoir operations.

128. Noted.

Responses to Washington Kayak Club

129. Noted. The 50 percent exceedence level for the Palmer gage (below diversion) on March 1 is approximately 900 cfs, and on June 15 about 500 cfs.

130. Noted.

131. See Response 34, Reauthorization of Howard A. Hanson Dam. These recommendations should be addressed specifically to a reauthorization study of Howard A. Hanson Dam, should such a comprehensive study be undertaken by the Corps. The instream flows program is unable to accommodate these needs since they require specific re- leases of stored waters.

132. A consistent release of 500 cfs from Howard A. Hanson Dam from September 1 is unavailable. Currently the Corps does supply a short- term flow release of approximately this magnitude for several days to stimulate upstream migration and temporarily improve water quality in the lower Duwamish River.

133. The peak discharges of May and June may be lowered by future water right diversion to storage for sustaining summer, low flow period supply. The instream flow of 650 cfs will retained instream.

134. The tributaries of the Green River are proposed for closure. Future rights to the main stem will be conditioned with the proposed in- stream flows.

135. Noted.

136 Noted.

137. See Response 34, Reauthorization of Howard A. Hanson Dam.

Responses to Washington State Parks and Recreational Commission.

138. Provision in the instream flows for "scenic and aesthetic," "navigation" and "other environmental values" is inherent in the rating system and the conversion to a first cut, hydrologic base flow. The Green River would not have been rated so highly were it not for these factors. The department is aware of the recommendations from the Washington Kayak Club and has tried to address their concerns.

139. Noted.

Responses to James L. Leonard

140. The alternative sources of water supply should be considered by the City of Tacoma in the development of the Comprehensive Water Supply Program.

141. Noted.

Responses to Seattle District, Corps of Engineers

142. Noted. It is the department's understanding that water pollution control was also cited in the congressional authorizing document as a potential future purpose of Howard A. Hanson Dam.

143. The Corps' response to Department of Fisheries requests for higher releases is recognized as a superior achievement.

144. The Green River instream flow program does not itself represent a request to the Corps of Engineers to increase the minimum flow levels on a mandatory basis. The purpose of the state instream flow is to set flow limits that will condition future water rights. The flow setting methodology of DOE encompasses the requirements of all instream resources, including fisheries. The State Fisheries and Game representatives are called upon to input their considerable knowledge and experience to the flow setting process. This results in flows that are particularized to prime or controlling species of fish. The instream flows program is an opportunity for the Fisheries, Game, and tribal fisheries interests to document their requirements. Requests to increase the minimum releases of Howard A. Hanson Dam could proceed from that point, but is not part of this flow setting program.

145. The department will consider this suggestion. It was anticipated that the instream flow program would centralize all state interests in the possible reauthorization of Howard A. Hanson Dam. This is apparently not realistic, due to the multiplicity of interests involved, and the overlapping jurisdictions. Tacoma's request for study of water supply storage in Howard A. Hanson Dam is subject to state water right action, and the provisions of the proposed instream f lows regulation. Requests for instream flow enhancement levels above the existing Corps authorization, of an augmentation nature, cannot be made by the department under the authorities cited in the instream flow program. The final document reflects these conclusions.

146. This was discussed at length in the workshop. The proposed regulations include descriptive material which sets forth the management of instream flows and water rights. Under state water law, future rights are conditioned to instream flow levels. These are fixed in respect to law, but require some resource management judgment during critical periods. The federal reserved rights are superior to these requirements and have the ability to modify state imposed requirements. WAC 173-509-030(2)(a)-(c) should be consulted regarding the hierarchy of affected rights and requirements.

147. See Response 16, Fall reservoir operations. Regarding the calendar date extension of the summer conservation flows period, it is the department's understanding that the flood season begins on November 1. The department has learned informally from the Corps that they would consider releasing the 110 cfs throughout the year. Fisheries arid game

personnel were instrumental in developing the operating procedures in the original authorization. Fish arrival normally occurs in late September and October. The department believes the Corps has the authority to maintain the conservation flow releases as late as possible in the fall. Storage availability can be assured by maximizing the conservation pool throughout the summer low flow period. This may cause the Corps to cut into the state instream flow increment (the difference between 150 and 110 cfs), but would not affect the existing Corps requirement of 110 cfs. The department is interested in pursuing the analysis of this operational modification with the Corps.

148. Noted. Tacoma's consultant has advised that water quality for municipal supply may be less of a problem than was once expected.

149. See Response 19, Instream flow methodology.

150. This is normally a high flow occurrence and unaffected by the regulation.

151. See Response 142.

152. Noted.

Responses to King County

153. Noted.

154. The department has asked for the local general purpose government for certain information about recreational activities, in the Green- Duwamish River basin. Recreational use of a regional scope is more familiar to local resource managers than the department, which is solely responsible for water rights authorizations. The River of Green study has been an important source document for the instream flows program.

The department has considered the relationship of recreation and low flows. The use of the upper river for boating activities requires higher flows than are normally available in the low flow period. Fisheries requirements, determined by Washington Departments of Fisheries and Game, were discussed at length in study team sessions. The proposed instream flows were checked against the spawnable area criteria supplied by Fisheries and Game. The findings of the analysis are incorporated as part of the final program document and supplemental EIS. Metro has supplied information regarding the water quality problem with temperature and DO and has proposed instream flow augmentation as an acceptable pollution abatement method.

155. Noted.

156 The purposes of the Green River Instream Resources Protection Pro- gram are to set conditions which will be used in regulatory authority affecting future water rights. The control of future diversions can be accomplished entirely through existing state authorities. Operations of the Corps are free from any binding state authority on flows management.

Specific contractual arrangements may have to be developed between the Corps and the City of Tacoma concerning water supply storage. The proposed final regulation contains reference to the potential for intergovernmental agreements to be developed in other, basin resource management programs, which would not be in conflict with the proposed regulations (WAC 173-509-010).

157. See Response 11, Standard operating procedures, and 23, Critical year determination. Clarifying language has been added to the pro- posed administrative rules setting forth the general conditions of a critical year (WAC 173-509-030(b)).

158. The proposed regulation has been updated with information developed in the workshop. See WAC 173-509-030(c) for descriptive material on the status of various rights and pending water rights applications in relation to operation of Howard A. Hanson Dam.

159. See Responses 24, Runoff-storage alternative and 26, Fall spawning flows.

160. The focus of the instream flows program is the systematic, basin-wide setting of conditions on future water rights. The options discussed in the programmatic EIS do address those available to the department. The processing of water rights applications on a case- by-case basis could continue, without or in advance of an instream flows program, and could possibly result in similar conditions being set on the subject applications. The instream flows program facilitates a broad perspective regarding water resources management. It does not provide all options to basin resources management as the comment might suggest.

161. See Response 34, Reauthorization of Howard A. Hanson Dam. Other programs may seek enhancement flows for the Green River.

162. The department has committed to a two-year time frame for the Western Washington Instream Resources Protection Program. This is admittedly rather short, but provides adequate time for field studies and planning to arrive at a coordinated flow set. The proposed regulation is reviewable within each five-year period.

163. Noted.

Responses to Friends of the Earth

164. The suggested flows exceed the authority of the department as implemented in the instream flows program.

165. Additional information is available in final EIS. The history of streamflow in the Green River is encompassed in the hydrologic period of record.

166. See Response 16, Fall spawning flows

167. Noted.

168. The Department of Fisheries has not requested during deliberations for this program summer rearing flows of greater than 150 cfs at Palmer, or 300 cf s at Auburn.

169. See letter of comment from Metro regarding the relationship between the Renton treatment plant study and the instream resources program for the Green-Duwamish River basin.

Responses to Citizens Committee for Clean Water

170. Noted.

171. The department regularly reviews the construction grants priority program as part of the state water quality planning process.

172. Howard A. Hanson Dam does provide a high degree of reliability for low flow period minimum flows.

173. The comment refers to probable status of Tacoma's historic diversion. If adjudicated (rights established through court action), Tacoma existing rights would probably equal natural flows of no greater than their present diversion (112 cfs). During periods when inflow into Howard A. Hanson Dam is less than the full diversionary capacity, the releases from Howard A. Hanson Dam effectively supplement the natural flow and allow continuous full diversion by the City of Tacoma. This may exceed their probable existing rights.

174. The status of claims or existing rights is not confirmed by the instream resources protection program.

175. Noted.

176. Noted.

Responses to URS Company (for King County Water District 124)

177. Noted.

178. See Response 4, Priority to instream uses.

179. The 300 cfs flow is measured at Auburn for the low flow period. The corresponding flow for Palmer would be 150 cfs.

180. The Water Resources Act of 1971 requires the department to establish instream flows in all perennial streams. The department has attempted to determine an adequate level of protection of instream resources. The impact of low flows on fish runs is well documented. State fish biologists believe that for some species naturally occurring low flows damage the resource, but during other better years the resource can recover. Long-term depletion of streamflow will destroy the resource.

181. The regulations proposed for adoption contain clarifying language regarding the critical year determination [WAC 173-509-030(b)]. The major affected water rights holders will initiate action during dry spells by requesting discretionary action by the director.

182. See Response 6, Ground water.

183. See Response 8, South King County water supply.

184. Noted.

Responses to Department of Social and Health Services

185. The Green River is also recognized by people of another perspective as a major recreational resource and the most important fisheries resource in Central Puget Sound.

186. Noted.

187. See Response 10, Management of instream flows. The construction of Howard A. Hanson Dam regulates the low flow to a minimum of 110. That is not to say that normally flows would not be greater than 110.

188. The Fisheries and Game departments have evidenced no intention of revising their goals and objectives for the fisheries management of the Green-Duwamish River basin.

189. This is not consistent with the Water Resources Act of 1971.

190. The instream flows program does not affect existing rights, therefore, it cannot reallocate any appropriated waters. The program does condition future water rights.

191. The department rejects this suggestion.

Response to Department of Game.

192. Noted.

193. Noted.

194. The department has reviewed the Department of Game request and has granted the desired increases in the minimum flows. The proposed instream flows represent less than a 5 percent reduction from maxi- mum spawnable area. Placing the instream flows higher may not prevent flows from decreasing to lower levels naturally. The requested instream flows of 650 cfs will be slightly less avail- able than the original DOE proposed instream flow of 650 cfs.

195. Noted.

196. See Response 23, Critical year determination. The one in one- hundred-year threshold for lower than critical year flow frequency is taken under advisement.

197. Noted.

Responses to Soil Conservation Service

198. Noted.

199. The department expects a drop in irrigation use in the basin. This has not been signified as a major affected use. The department will review the comment.

Responses to Department of Transportation

200. Noted.

Responses to Faye Ogilvie (Washington Environmental Council)

201. Noted.

202. Noted.

203. See Response 15, Open watershed.

Responses to National Marine Fisheries Service

204. See Response 26, Fall spawning flows.

Response to Vancouver Wildlife League

205. Noted.

Responses to Mt. Baker-Snoqualmie National Forest

206. Noted.

Responses to Pierce County Sportsmen's Council

207. Noted.

208. See Response 26, Fall spawning flows.

Responses to L. Dennis White, Green River Community College

209. Noted.

APPENDIX E

Public Hearing Testimony

The statements were given at the public hearing, February 7 at Auburn, and constitute official public record on the Green-Duwamish Instream Resources Protection Program. These are in addition to the official letters of comment in Appendix C.

Written statements were received from the following:

Dwain F. Hogan - Corps of Engineers
Larry Moe - Northwest Steelhead & Salmon Council of Trout Unlimited
Nancy Nelson - U.S. Fish and Wildlife Service
Dave Clark (for John Spellman) - King County
Bruce Lindquist -- Kent
Ray Johnson - Washington Department of Fisheries

Other testimony was received from the following:

Norman A. Moberg - Washington State Sportsmen's Council
George Steele - Green River Steelhead Club
Kim Balduff -- Citizens for Rezone
Lauri Johnson - Seattle Audubon Society
Tom Miller - Northwest Steelhead and Salmon Council

CORPS OF ENGINEERS' STATEMENT PRESENTED AT PUBLIC HEARING HELD BY WASHINGTON STATE DEPARTMENT OF ECOLOGY ON PROPOSED INSTREAM RESOURCES PROTECTION PROGRAM FOR GREEN-DUWAMISH RIVER BASIN

The Corps of Engineers commends the Department of Ecology's effort to provide an equitable instream flow regimen for the Green-Duwamish River basin.

We have completed a preliminary review of the Instream Resources Protection Program. Written comments will be submitted by the 15 February deadline.

In 1949, Congress published the document which mandated the procedures by which Howard A. Hanson Dam must be operated to fulfill its two primary purposes. To quote the document, "These two purposes are first, flood control, and second, conservation by providing an augmented low water supply for preservation of fish life. " 1

"Flood control will require reservation of the entire storage from the 1st of November to the 1st of March to detain possible flood flows." With regard to low flow augmentation, the "reservoir has sufficient storage to supply continuously at least 110 second-feet from March until September in the driest year of record without interfering with its use for flood control."

The authorizing document further states:

> "At present, water rights on Green River are subject to the limitations of natural flows and the priority of other rights. With the storage plan proposed in this report the United States would not be obligated to supply the requirements of any existing water right other than to always release, during periods of low flow, at least the amount of natural inflow into the reservoir."

The State of Washington's authority is limited to natural flows and does not extend to storage behind Howard Hanson Dam. Any change in the operation of Howard Hanson Dam requires in-depth study and may require Congressional approval. We will need 2 to initiate comprehensive studies to determine comparability of present and requested future flows and stated needs. 3

Any increases in future storage rights will be determined by two factors:

(1) The amount and distribution of benefits to various purposes.

(2) The cost of additional storage to be borne by qualified local sponsor(s) 4

We realize that the current low flow level was established thirty years ago and that the State-of-the-art of fisheries management may have changed. However, we believe that the Department of Ecology has not presented adequate justification for increased low flows.

We recommend that adoption of this program for the Green-Duwamish River basin be deferred until a comprehensive study can be conducted by all agencies concerned to determine an acceptable allocation of water in the Green River. 5

The Corps intends to fully cooperate as we have in the past in accomplishing necessary studies.

TESTIMONY TO THE DEPARTMENT OF ECOLOGY SUBJECT BEING THE GREEN RIVER INSTREAM RESOURCE PROTECTION PROGRAM.
GIVEN THIS DAY FEBRUARY 7, 1980 BY LARRY MOE, STEELHEAD CHAIRMAN OF THE NORTHWEST STEELHEAD AND SALMON COUNCIL OF TROUT UNLIMITED AND 2 TIME PRESIDENT OF THE SO. KING COUNTY CHAPTER OF THE NORTHWEST STEELHEAD AND SALMON COUNCIL OF TROUT UNLIMITED.

NORTHWEST STEELHEAD & SALMON COUNCIL OF TROUT UNLIMITED

February 7, 1980

Gentlemen:

Before I get into my main reasons for being here tonight, I think it extremely important to express our heart felt thanks for being allowed this opportunity to express our views. For too long has the Green River suffered the loss of it's natural fish resources because Government bureaucrats refused to listen to the deep felt concerns of the people. We applaud you and your actions to got the public involved in these programs.

To begin with I wish to point out who it is that I am here representing tonight. Along with the Steelheaders Council members of which there are currently 2,000 I also feel an obligation to the 130,000 Steelhead punch card holders in the State and I also feel a strong obligation to the future generations of Sports Fishermen yet to be born, but most of all and of paramount importance is my obligation to the Steelhead and Salmon resources in the Green Rivera

First and foremost in our requests of you is adequate water flows for the entire year to protect the instream life cycle of the Steelhead and Salmon. In the past years since the completion of the Howard A. Hansen Dam the flow levels have been played with like a child plays with a toy Yo-Yo. One week flows at the

Continued . . . . .

Auburn gauge may be 1,000 C.F.S. and the next week cut back to 300 C.F.S. This practice has got to stop because of the damage done to the spawning Redds which are left high and dry. This practice also allows fry and smolts to become trapped in back water pools and Eddys which eventually dry up and this means the suffocation of countless thousands of fish each year. We note with great appreciation that this draft of the Instream Resources Protection Program deals with this on going problem but it is our strong concerns and beliefs that it does not go far enough.

Before I go into what it is that we feel that we must have, let me say that we support both the State Game and Fisheries Departments requirements and statements. Our concerns run parallel with their's with suggestions for improvements. 6

These improvements can be itemized into two concerns, those being .increased year around base line flows and the time intervals between high and low flows. First, lets look at our demand for greater base line flows. Instream flows as recommended in the draft are not adequate for our concerns and needs. The draft says that during a normal year at the Palmer Control Station a 150 C.F.S. from July 15th through October 1st with a gradual increase to 300 C.F.S. up through Oct. 31st is recommended. We object in the strongest possible terms to this recommendation and respectfully request that the very minimum base

Continued .....

flow be 300 C.F.S. at this control station at any given time in the year. We feel most justified in this demand for these reasons. First, We as Sports Fishermen fish from the Barrier Dam down through the Gorge area for Summer Run Steelhead, we fish these 20 miles of river because this is the section of the river where the concentration of fish are during this time of the year. We as Sports fishermen are the only citizens of the State paying with our dollars to propogate these Summer Run Steelhead. It is therefore not unreasonable of us to want an adequate water flow to produce the needed environment and habitat to harvest this resource paid for by us. The recommended 150 C.F.S. falls far short of this needed flow and the 300 C.F.S. in bare border line. This is because these fish are truly wild in every way. With a 150 C.F.S. which is a more trickle in the stream bed, these fish take cover in the deeper holes when one approaches these holes to fish them the fish are spooked and will not strike and even with our requested 300 C.F.S. the challenge will still be a formatable one. 7

Secondly, the time intervals between flow levels must be over a longer period of time than the one recommended in the draft. We call your attention to the flow chart on page 3 or the D.O.E. recommendations. Notice that on July 1 at the Palmer Control Station the flow is 300 C.F.S. Notice next if you will that on July 15th only two weeks later the flow is cut in half to only 150 C.F.S. Here we have the old 8

Continued .....

situation where Redds and fish are lost, this time interval must be at least 3 weeks (21) days long with specific daily flow drops spelled out, for who's to say that the flow may be 300 C.P.S. on July 14th and cut to 150 C.F.S. overnight? Of course the flow figures are yours with hopes you'll accept ours.

Well then, there you have our requests/demands. I wish to point out that our requests are made with the fullest knowledge of the city of Tacoma' a water demands . I also wish to point out that the city of Tacoma does not, I repeat does not have or hold any type of a monopoly on the water of the Green River. We feel that if the city of Tacoma is concerned about additional water supply that they look elsewhere, perhaps to the Lake Cushman Reservoir they have or even to the Reservoirs they have created on the Cowlitz River with the Mayfield and Mossyrock Dams. In short here Gentlemen, lets not let the city of Tacoma with it's selfish interests destroy the natural fish runs of the Green River which belongs to all the citizens of the State. 9

Respectfully Submitted

Larry Moe

Steelhead Resource Chairman

N.W.S. & S.C.

January 15, 1980

TO: DEPARTMENT OF ECOLOGY

FROM: LARRY MOE, STEELHEAD CHAIRMAN, NORTHWEST STEELHEAD AND SALMON COUNCIL OF TROUT UNLIMITED

SUBJECT: CITY OF TACOMA'S APPLICATION TO APPROPRIATE PUBLIC WATERS, APPLICATION NUMBER 3787

Sirs,

Our Council is protesting and objecting in the strongest terms to this application. This action of application in an obvious ploy an behalf of the City of Tacoma to acquire the 100 C.F.S prior to adoption of the Green-Duwamish River basin Instream Resources Protection Program. This draft plan is still in the hearing process and the final plan and program is still some time off. Public notice quotes that a detailed statement must accompany this letter of objection. We could include the entire contents of the current draft proposal of the Instream Resource Protection Program as our comments but will choose instead to summarize our comments. Our objections to additional water withdrawal from the Green River are as follows. 10

1. Howard A. Hansen Dam is authorized to provide for flood control and Fishery Conservation,
The congress in authorizing this project said domestic water supply, irrigation and other items were secondary. Any additional withdrawal of water from the Green River will be detrimental to fishery conservation and therefore violate the Congressional approval. 11

2. Instream flow effected by the additional withdrawal of water will fluctuate the water level adversely effecting Steelhead and Salmon eggs, fry and smolts. Again Congress authorized this project for fishery conservation as a first priority and this net effect is in reverse of the fishery conservation. 12

Continued .....

January 15, 1980

Continued Page 2

TO: DEPARTMENT OF ECOLOGY

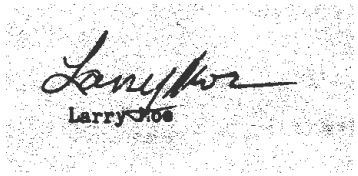
FROM: LARRY MOE, STEELHEAD CHAIRMAN, NORTHWEST STEELHEAD AND SALMON COUNCIL OF T.U.

3. We at this point are entering a new argument in which we believe very, very strongly. Steelhead programs in our State are supported solely by the Sportsmen's dollars. The Green-Duwamish River is number 2 in the State in the harvest of the Steelhead Trout. Therefore, we have the absolute right to demand adequate water flows to sustain the needed environment to harvest these fish.

To reiterate our position on this request, increased withdrawal means lower water flows in the river, lower flows mean a loss in habitat, fish in all stages of their life cycle and the loss to the Sportsmen in ability to harvest the resource he is paying to propogate. **13**

We, as citizens of the State of Washington point out to you that you are charged with protecting the environment within our State. The request by the City of Tacoma is not only in violation of the Congressional authorization of Howard Hansen Dam but in violation of the fishery environment and nature itself.

We, as concerned sportsmen who are working to protect the cold water fishery of Washington not only request that this allocation of an additional 100 C.F.S. be denied we DEMAND it.



cc: Rod Sakrison–Department of Ecology
Dave Clark–King County Planning
Hal A. Beecher–Game Department

STATEMENT OF THE U.S. FISH AND WILDLIFE SERVICE

on the proposed GREEN RIVER BASIN INSTREAM RESOURCES

PROTECTION PROGRAM (173-509 WAC) presented February 7, 1980

My name is Nancy Nelson and I'm here tonight to present the concerns of the U.S. Fish and Wildlife Service regarding the proposed Green River Basin Instream Resources Protection Program. We continue to commend your objective of maintaining flows in Washington streams in sufficient quantities to protect instream fish and wildlife values. Although we still do not approve of your base flow methodology, we have generally been very pleased at the outcome of the negotiation processes on the other basin programs between yourselves as hydrologists and the state fish and game agencies as the biological experts. It appears that the DOE staff was developing a good working knowledge of the water needs of the resources they are mandated to protect. Unfortunately, the proposed Green River program does not adequately protect fish or their eggs in terms of either quantity or timing of flows. Field testing has repeatedly shown that flows of 800 c.f.s. are needed to make use of the available natural spawning area in the Green River. **14** Regarding timing, peak spawning of Chinook salmon in the area affected by the Auburn control point occurs from September 25 through October 10. **15** Therefore, the prescribed increase in flows from 300 to 800 c.f.s. needs to begin September 25 rather than October 1.

This increase in flow and change in timing is very important biologically because the term "base flow" becomes a misnomer in the case of a river whose flow is controlled by a dam.

Historical records of controlled rivers, such as the Green, clearly demonstrate that defined minimum flow schedules become the operating rule rather than an occasional exception. There should be little problem with implementing these changes considering the fact that the dam controlling this river has fish flow augmentation as an authorized purpose, and that the objective of your program is to protect instream resources. 16 17

There is no question that the salmon and steelhead runs of this state are in trouble. Puget Sound commercial fishermen are applying for federal disaster aid, and sportsmen and the people who make their living catering to recreational fishing are also severely affected. We must protect the instream habitat that produces these fish from further thoughtless degradation. Therefore we urge the Department of Ecology to make these necessary changes in flow and then adopt the program administratively on April 22 as originally scheduled. The Departments of Fisheries and Game requested these changes years ago. It is time for action.

John D. Spellman
County Executive

King County Courthouse
Seattle, Washington 98104
(206) 344-4040

February 7, 1980

Mr. Wilbur G. Hallauer, Director
Department of Ecology
Olympia, Washington 98504

RE: COMMENTS ON GREEN-DUWAMISH BASIN IN-STREAM RESOURCE PROTECTION PROGRAM - PROPOSED ADMINISTRATIVE RULES AND DEIS

Dear Mr. Hallauer:

King County is still in the process of completing its review of the proposed in-stream flow regulations for the Green/Duwamish River Basin and its suppleental draft environmental impact statement (DEIS). I have directed that review be coordinated through the County Environmental Impact Committee which represents all County departments. Detailed comments on the proposed flows and DEIS will be submitted within the time frame for written responses as part of the County's formal written transmittal. Tonight my testimony will be limited to certain broader issues concerning a need for water resource management planning in the Green River Basin that has become apparent from our initial reviews of the in-stream resource protection program.

King County, as an areawide, general purpose local government, has a long-standing interest in the Green/Duwamish basin. Historically, that interest has included flood control, land use management, and park and recreation planning. The County together with the State is an original local sponsor of the Howard Hanson dam and financially contributed $500,000 to the project. The County has also served as coordinating local sponsor for major flood control and drainage works in the lower Valley planned by the Soil Conservation Service and Corps of Engineers.

More recently, that interest has expanded with the establishment of the Green River Basin Program - a comprehensive surface water management program being carried out cooperatively by the County and the four Green River Valley cities. Through the basin program the County has completed a river recreation study known as the River of Green which identifies additional river-oriented recreational opportunities and acquisitions which will add to an existing inventory of over 350 acres of County parks fronting on the river and several miles of river access easements. The County is also working closely with the City of Tacoma and METRO on projects they have proposed for water supply and wastewater as well as with the State and U.S. Fish and Wildlife Service to enhance fish and wildlife habitat in other parts of the basin.

The importance of mentioning these projects and programs collectively is to show that they are all in some way dependent on or related to the river and linked together by two important common denominators. The first is water itself: in some cases too much, in other cases, too little, too dirty or not enough at the right time of year. The second common denominator is the Corps of Engineers, for it is the Corps that is responsible for regulation and control of river flows downstream of the Howard Hanson dam.

The significance of understanding these linkages is important because it is these very factors that also link the various governments, agencies and groups which have interests in the waters of the Green River. And it has come as no surprise to anyone that these interests have, over the years, become more diverse, more specialized, and in many senses more polarized as competition for the river's water has intensified.

We believe that it is now time to look at the Green River comprehensively - relating all the various water interests and needs to one another, not as competitors or adversaries, but to the river and the capability of the river to meet those needs; recognizing that the Corps of Engineers' ability to change the operation of the Howard Hanson dam is a key to achieving permanent, long-term solutions. We believe the State, through the provisions of the Water Resources Act of 1971, should assume a leadership role in this effort to look at the total range of in-stream flows - both high flows and low flows - seasonally as they affect both appropriative and conservation uses. Specifically, we recommend the following:

1) The State, in cooperation with King County, initiate a program to bring together the various agencies with interests in Green River water for the purpose of identifying those interests and relating them to one another in a comprehensive manner. The underlying premise of this program would be to provide a forum to cooperatively meet in seeking solutions to river management issues and problems.

2) That the establishment of such a cooperative effort be the mechanism through which the composite needs of all State and local governments and agencies for Green River water be compiled, summarized and transmitted to the Corps with requests for the Corps to study the operation of the dam consistent with those needs.

3) That through this locally initiated program and Corps study, a comprehensive river management plan be developed and adopted by the State

And other agencies setting forth water resource policy and procedures for the utilization, conservation and management of the water resources of the Green River.

We appreciate the opportunity to review the in-stream program for the Green River and to submit testimony at tonight's hearing. We look forward to your positive response to our recommendations which are made with not only the County's interests in mind but that of all river users.

Sincerely,

John D. Spellman
County Executive

JDS:df

25429-32nd Place South
Kent, Washington 98031
February 6, 1980

Dear Sirs:

There are two million people that have easy access to recreation on the Green River. Population studies are predicting many more in the future. My family consists of only four of these users, but we really enjoy boating and fishing the Green River especially in the summer. We can get to the river in less than ½ hour and by using less than one gallon of gas. This is becoming more important each year with the price of transportation going up.

We are against any more water being removed from the Green River during the summer. Last summer the river was too low for good boating or fishing. Low summer flow rates reduce the number of native steelhead and salmon that the river can support. The number of native fish in the Green River has been declining for many years. 22 23

We are in favor of Tacoma allowing the Department of Game to plant wild migratory summer run and winter run steelhead above Howard Hanson Dam to utilize the spawning potential of the watershed. I want my children to have the opportunity to enjoy the full recreation potential of the Green River that I have enjoyed for more than 30 years. 24

Sincerely,

Bruce Lindquist

STATEMENT OF THE WASHINGTON DEPARTMENT OF
FISHERIES ON THE GREEN-DUWAMISH RIVER
BASIN INSTREAM RESOURCES PROTECTION PROGRAM
WASHINGTON DEPARTMENT OF ECOLOGY. PUBLIC HEAPING
AUBURN, WASHINGTON
February 7, 1980

The Washington Department of Fisheries is appreciative of this opportunity to comment on the Green-Duwamish River Basin Instream Resources Protection ProcraM. This statement addresses only our major concerns regarding the proposed Administrative Rules. Additional detailed comment on your Draft Document and Supplemental Environmental Impact Statement will be submitted by a letter to fol1ow.

The primary salmon species utilizing the mainstem Green River, where instream flow regulations are now being considered, is chinook salmon. While large coho runs return to the basin, their production is more dependent upon tributary streams. A chum population also spawns in the mainstem late in the year, but is of smaller size. It is therefore our view that chinook production is the single most important instream usage in the Green-Duwamish Basin to be influenced by these proposed regulations. 25

Natural chinook spawning escapements during a recent twelve-year period totaled up to 11,171 adults annually. Virtually all of these spawners utilize the mainstem of the river. Based on a harvest model that considers several years of coded wire tag recovery data, the catch-to-escapement ratio for this stock is 6.3 to 1, which translates into a harvest of as many as 70,377 chinook salmon each year for sport and commercial fisherman. In addition to significant natural production, this basin is critical to the state's artificial propagation program for chinook salmon. A major facility is located on lower Soos Creek, with satellite stations at Crisp Creek and Icey Creek. An additional facility is in the advanced planning stage at lower Icey Creek. Escapement to our hatchery rack last year (1979) totaled 14,985 spawners, which means there were a total of 94,405 hatchery chinook salmon caught. Recently expanded production will yield larger benefits in the very near future. 26

The reason for our emphasis on chinook salmon is that the adults return in September and October, during the period of lowest streamflow of the year. It should then be totally clear that their production is dependent upon and positively related to flows available in the stream during this time frame. There must be sufficient flow for migration to spawning areas or hatchery racks, adequate depth and velocity for the natural spawners, and suitable water quality in the lower river to prevent stress or mortality. These factors influencing production are all related to stream flows, and each has presented problems at times in the Green-Duwamish Basin. 27

while the Department of Fisheries supports the establishment of instream flows in western Washington streams, we cannot support the normal year flow regulations proposed for the Green River. This flow schedule prescribes a modest increase at the Auburn Control Station from 300 cfs beginning on October 1 to 350 cfs on October 15, followed by an increase to 550 cfs by November 1. Unfortunately, the peak chinook salmon spawning in this same area occurs during the period September 25 through October 10, or about 5 days to three weeks earlier than the prescribed flows that would protect this resource.

28

It is our recommendation, therefore, that your regulation for Green River instream flows reflect the requirements for mainstem spawning of chinook salmon. Specifically we ask for an increase in flow from the normal summer minimum level of 300 cfs to begin at least by September 25, and to reach the 550 cfs level on October 10, for accommodation of chinook salmon production.

29

APPENDIX F

Responses to public testimony

Responses to Dwain Hogan - Corps of Engineers

1. Noted.
2. The department may issue permits to divert public waters for consumptive use and for diversion to storage. Once stored under a state right, the use of storage behind Howard A. Hanson Dam would be regulated by the Corps of Engineers. Contractural arrangements with the Corps would govern the use of the stored waters.
3. Noted.
4. The City of Tacoma has requested study of the use of 26,000 acre-feet storage in Howard A. Hanson Dam for municipal and industrial water supply.
5. The instream flows program precedes a complete basin program in the Green-Duwamish River basin. The instream flows program does not establish rights or allocate remaining public waters.

Responses to Larry Moe - Northwest Steelhead and Salmon Council of Trout Unlimited

6. Noted.
7. Flows of this quantity are not available from natural runoff, except during extremely good years. To provide storage to create these flows might be difficult and expensive. The proposed instream flows would not require additional storage and would achieve nearly total provision of spawnable area. Fisheries and Game support the summer rearing flows of 150 cfs at Palmer.
8. The transition period of July 1 to July 15 corresponds closely to the natural recession in streamflows in the Green River.
9. The City of Tacoma will discuss alternative sources of supply in the Comprehensive Water Supply Plan to be completed in the spring, 1980.
10. The pending water right action will be conditioned with the flows established in the Green-Duwamish Instream Resources Protection Program.
11. Future water rights on the Green River will be allowed if they are not in conflict with the provisions of chapter 173-509 WAC.
12. This has not been substantiated.
13. Noted.

Responses to Nancy Nelson - U.S. Fish and Wildlife Service

14. The department believes that in the case of the Green River, the flows proposed for adoption represent the most efficient delegation of minimum flow. By achieving nearly total protection of spawnable area the flows setting program implements the state authority vested in the Water Resources Act of 1971.
15. See Response 26, Fall spawning flows.
16. Noted.
17. The Corps of Engineers' relationship to this program is twofold: (1) any state water rights for storage in Howard A. Hanson reservoir must have made prior commitments with the Corps to legally store water, and (2) surplus inflow in the summer low flow period may be stored by the Corps to maximize the conservation pool or be passed through the reservoir to make up the instream flow increment.

Responses to Dave Clark (for John Spellman) - King County

18. Noted.
19. Noted.
20. The broad scope of the Western Washington Instream Resources Protection Program may draw heavily upon the resources of the department's water resources planning staff. The department would be supportive in the areas of its special expertise and authority. Preparation of a list of priority items might be a place for the suggested coordination to begin. Local input to the Green River instream flows program may have taken a step in this direction.
21. Specific authorities to accomplish the goals of the comprehensive plan may either be lacking or institutionally the affected jurisdictions may be autonomous entities in the basin.

Responses to Bruce Linquist

22. Noted.
23. Noted.
24. Use of the upper watershed for fish rearing is not related to the instream flow program.

Responses to Washington Department of Game

25. Noted.
26. Noted.
27. The fisheries requirements are considered in study team sessions for the instream flows program.

28. See Response 26, Fall spawning flows.

29. The expected recurrence frequency of those earlier flows is prohibitably low. If established in the proposed regulation, enforcement of the regulation would be more than periodic and may, in fact, be placed on a case-by-case basis. It is nearly an ad hoc situation in the fall at the present time,

APPENDIX G

Workshop - Tacoma, WA - March 10-12, 1980

The department, at the urging of the City of Tacoma and other interested parties, held a joint sponsored workshop at the City of Tacoma Public Utilities Building. It was atteded by over forty-five participants. The objective of the workshop was to clarify the intent and effect of the proposed regulation, to present technical analysis too broad for either the public having or draft program document and develop a more widely understood regulation.

There was no official record kept of the workshop, since it was a working session ariA not J.ntended to serve a% a legal. instrument. The exchange of views and opinions was very lively and led to the development of modifications in the instream resources protection program and the proposed regulation. Changes of wording in the proposed regulation were sent to the workshop participants for a ten-day review period. These comments were incorporated in the final proposed regulation, Appendix B.

List of Participants

Department of Ecology - John Spencer, Gene Wallace, Kris Kauffman, Rod Sakrison, Herman Huggins, Stan Mahlum, Al Wald, Bob McCormick, Tom Elwell, Carol Fleskes, Stacia Peterson, Ken Slattery.

City of Tacoma - John Roller, Ken Olsen, Dave Sherman, Ken Kral, Charles Howard, Bob Wubbena, Larry Sims, Mark Bubenik, Doug Smith.

Northwest Steelheaders Joe Stone, J. J. Leonard

Was1iington Department of Game - Hal Beecber

Wasliington Department of Fisheries - Ray Johnson

Department of Social and Health Services - Ken Merry, Richard Siffert, Alan Rowe, Eric Slagle, Bob James, Robert E. Leaver

U.S. Fish & Wildlife Service - Nancy Nelson, Richard Johnson

Muckleshoot Indian. Tribe - Dennis Moore, Richard Reich

King, County - Donovan Tracy, Dave Clark, Tom Nesbitt, Bill 1,um, Sid Steinborn

Puget Sound Council ol Governments - Pete Beaulieu

Corps of Engineers - Larry Merkle

Metro - Pete Machno

Water District #124 - B. J. Christensen

City of Renton - Gene Williams

City of Bellevue - Jeff Ethleston

First Day - March 10

John Spencer, Assistant Director for Water Programs opened the workshop by stating that the objective would be to develop agreed upon recommendations that DOE would use in reconsidering the proposed regulations. The workshop will consider the principal alternatives and technical analysis. Standard operating procedures will be discussed at length.

Perspectives on the regulation, presented by the participants, were essentially as presented in the official letters of comment, Appendix D.

The Corps of Engineers has not had enough time to review the proposed flows to see if there are any conflicts with their operations. At this point they do not feel bound by the proposal, and would be cautious to make changes should there be impacts to others. They may he able to meet the flows on a case-by-case basis, as directed by Fisheries.

The department presented a review of the program, to indicate areas where there have been misunderstandings. Specifically, the hydrograph is not a release curve for Howard A. Hanson Dam. The instream flows should be available during the summer from natural flows. This will give direction to the rest of the workshop as the participants become more familiar with the instream flow program.

Second Day - March 11

John Spencer again opened the workshop with a critique of the previous day's session. He indicated that additional work needs to be done to clarify the regulatory process and how flows affect projects. The proposed regulations do not make water, and do not mandate the Corps' operation, but they will serve as targets for their operation.

The City of Tacoma's consultant, Chuck Howard, presented the technical and water resources studies he has developed for the Green River. He has reviewed the physical resources and natural limitations, analysis of the supposed operation of the reservoir and simulated the river on the basis of five-day intervals. The information is in a draft form and will be published as the Green River Water Supply Capabilities for the City of Tacoma.

The assumptions used in Howard's analysis are narrow and restrictive and lead to misguided results if followed. The future diversion of municipal and industrial water supply will be conditioned only to the Palmer gage and no storage will be necessary to supplement natural stream flow. Howard's objective of maximizing instream and out-of-stream uses does not correspond to the proposed regulation, and places higher constraints on the future water supply. This was the cause of his earlier erroneous statement that following DOE's curve would result in exhausting the currently available conservation pool.

Howard has corrected his earlier statement that the Green River fisheries management cannot be predictably based on calendar dates. Unlike the Cedar, the Green fish return around the last week of September.

Howard offered new conclusions regarding the need for storage for M&I purposes. He said with the DOE-suggested interpretation of the proposed rules, no new storage may be required.

In the afternoon session, Stan Mahlum, DOE, discussed the technical analysis DOE has done on the proposed regulation. The presentation centered on the method of forecasting the amount of water storage at several decision points. The DOE method is based on the SCS's Water Supply Outlook for Washington. This will constitute the standard operating procedures for DOE's operations.

Howard stated he could now perform yield analysis based on DOE's procedures. The results would not be available till mid-April.

Third Day - March 12

Gene Wallace began the third day of review with statements regarding the adoption process, and the options that the director will have. He noted that the final EIS will be out at least seven days prior to the April 22 adoption date.

The majority of the final day session was spent in detailing all comments on the proposed administrative rules, Chapter 173-509 WAC. The following areas were discussed:

- A Purpose section will be added in the final; it was inadvertently left out of the draft.
- DOE concurs that there are problems with the Palmer gaging station and modifications may be necessary.
- The tributaries of the Green will be closed, but storage projects may be allowed. New language added to regulation.
- Suggested changes to the ground water section were developed.
- The forecasting method, which will be detailed in standard operating procedures, will be built into the proposed rules.
- A new section regarding implementation and other future comprehensive basin resource management programs was recommended. The wording will be included in the new Purpose section. This will also require DOE review of any Corps operational change to check for consistency with the chapter.

The workshop was adjoined with the promise that DOE would revise the regulation as indicated above and expect responses back by the end of March.