

# ADMINISTRATOR'S DECISION RECORD

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## COMMONLY USED ACRONYMS

BC Hydro -	British Columbia Hydro and Power Authority
BPA -	Bonneville Power Administration
CBFWA -	Columbia Basin Fish and Wildlife Authority
Corps -	U.S. Army Corps of Engineers
Council -	Northwest Power Planning Council
DOE -	Department of Energy
DSI -	Direct Service Industries
EA -	Environmental Assessment
EIS -	Environmental Impact Statement
FCRPS -	Federal Columbia River Power System
FELCC -	Firm Energy Load Carrying Capability
FERC -	Federal Energy Regulatory Commission
FONSI -	Finding of No Significant Impact
Fish	
Agreement -	Non-Treaty Storage Fish and Wildlife Agreement
GAO -	General Accounting Office
IDF&G -	Idaho Department of Fish and Game
IDU -	Intertie Development and Use
kcfs -	Thousand Cubic Feet per Second
kWh -	Kilowatthour(s)
MAF -	Million Acre-Feet
MCP -	Mid-Columbia Participants
MW -	Megawatts
NTSA -	Non-Treaty Storage Agreement
Northwest	
Power Act -	Pacific Northwest Electric Power Planning and Conservation Act
PNW -	Pacific Northwest
SAM -	System Analysis Model
SOR -	System Operation Review
Treaty -	Columbia River Treaty
U.S. -	United States
USFWS -	U.S. Fish and Wildlife Service

**ADMINISTRATOR'S DECISION RECORD**  
**NON-TREATY STORAGE AGREEMENT WITH BC HYDRO**

**I. DECISION**

This document supports a decision by the Administrator of the Bonneville Power Administration (BPA) to enter into an agreement (the Non-Treaty Storage Agreement [NTSA]) with the British Columbia Hydro and Power Authority (BC Hydro). The Agreement provides for additional use of existing storage space on the Columbia River in Canada. The Agreement does not require any particular operation of the storage space but provides for both BPA and BC Hydro to store and release water within existing downstream requirements.

Potential companion agreements with the owners, operators, and power purchasers from the five non-Federal generating projects on the Columbia River (Mid-Columbia Participants [MCP]) are not addressed in this decision record. Negotiations between BPA and the MCP's are only in the preliminary stages.

A. Summary of Agreement

Contract No. DE-MS79-90BP92754 with BC Hydro will essentially replace the existing NTSA (Contract No. DE-MS79-84BP90946) that has been in effect since 1984 and is scheduled to terminate in 1993. The new NTSA is patterned after the existing agreement so that most of the provisions of the two agreements are similar. The new agreement, however, expands the amount of non-Treaty storage space made available in Mica Reservoir from the current 2.0 million acre-feet (MAF) to 4.5 MAF. Also, the term of the agreement is extended from 1993 to 2003.

The existing NTSA and the new agreement provide for: (1) mutually acceptable methods to accomplish future initial filling of relatively small new reservoirs on the Columbia River in Canada (but does not require such construction); (2) mutually beneficial uses by BPA and BC Hydro of certain non-Treaty storage space in Canadian reservoirs; and (3) storing water in Treaty space in Mica and Arrow reservoirs in addition to that currently permitted under the Columbia River Treaty (Treaty).

B. Background

Coordination of the Pacific Northwest (PNW) and BC Hydro systems began in 1964 with the ratification of the Treaty. Under the Treaty, Canada was required to construct 15.5 MAF of storage at the Mica, Arrow (Keenleyside), and Duncan projects. The United States (U.S.) was allowed to construct 5 MAF of storage at Libby Dam.

BC Hydro also built storage on the Columbia River system beyond what was required by the Treaty (termed non-Treaty storage), including storage behind Revelstoke Dam and an additional 5 MAF of usable storage at Mica. On occasion, BC Hydro has also made available 2 feet (0.26 MAF) of storage in Arrow above the normal full elevation of the Arrow Reservoir. Agreements

ancillary, but in addition to, the Treaty are required to operate existing non-Treaty storage space on the Columbia River in Canada. Short-term agreements were signed in 1983 between BPA and BC Hydro, along with companion agreements with MCP. They enabled storage of surplus water to help initially fill Revelstoke Dam prior to the existing NTSA. Currently, under the NTSA signed in 1984, BPA and BC Hydro equally share 2 MAF of the Mica non-Treaty storage. The potential environmental effects of the existing NTSA were evaluated in the Environmental Assessment (EA) for the Proposed Agreements to Resolve Revelstoke Filling Issues and Access Reservoir Storage Space in Canada (October 1983). Based on the EA and on the public comments received on the EA, a Finding of No Significant Impact (FONSI) was made on December 9, 1983. An Administrator's Record of Decision was issued in January 1984, and is included as a part of this record.

BPA and BC Hydro agreed in October 1987, to study additional coordination of the Columbia River in Canada. The new NTSA is a consequence of this agreement. The NTSA will provide the flexibility to more effectively use existing storage space in Canada to provide more marketable energy in both Canada and the U.S. while meeting nonpower requirements. The agreement will help reduce revenue and power losses resulting from the Water Budget (consistent with the Council's guidance to do so), and other nonpower requirements, while increasing the flexibility of the Columbia River Power System within existing operating requirements.

### C. Public Consultation

In accordance with BPA's Fish and Wildlife consultation procedures, public meetings were held with State and Federal fish and wildlife agencies, Indian Tribes, utilities, and the public to exchange information on the proposed NTSA.

BPA invited over 150 individuals and groups known to be interested in fish, wildlife, and power issues to a meeting on December 19, 1988, to discuss options for improving the efficiency of power operations between BC Hydro and the PNW. During the meeting, BPA staff discussed the proposed Agreement, described the planned analyses, answered questions, and solicited comments. Written comments were also requested by January 12, 1989.

In response to public comments, BPA scheduled a second public consultation meeting on March 14, 1989, to discuss the results of studies on the expected environmental effects of the proposed NTSA. Prior to this meeting, BPA distributed the Non-Treaty Storage Agreement Discussion Paper that explained the potential uses of non-Treaty storage, presented the analytical methods for determining environmental effects of the proposal, and discussed preliminary study results for opportunity use of non-Treaty storage. Comments were invited by mail or at the meeting. At the March 14, 1989, meeting, BPA presented new information on the preliminary results and circulated a signup sheet for an early April mailing of material on firm resource use of non-Treaty storage. The comment period was extended from March 23, 1989, to May 1, 1989, in order to allow a more thorough review of

the new material. BPA especially sought comments and suggestions on analytical tools and methods and comments about the effects of non-Treaty storage on river operations and fish. In order to respond to questions received and still allow interested parties sufficient time for review and comment, BPA again extended the comment period to May 22, 1989. Late comments were also accepted.

In response to questions and comments made by representatives of fishery agencies and Tribes during the meetings and in comment letters, BPA sent personal letters to agency heads and Tribal leaders seeking further information and analysis to support claims of potentially adverse impacts to fish and wildlife. Responses to these letters contained no new information and offered no better models for analyzing anadromous fish impacts. At the request of the Northwest Power Planning Council (Council), BPA conducted a technical workshop on June 21, 1989. Several smaller group meetings were also held with interested commenters.

BPA received 35 comment letters in response to the NTSA Discussion Paper and public meetings. The major issues were identified. Comments were grouped by topic and summarized, and responses prepared. The Non-Treaty Storage Agreement Issue Summary and Response to Comments was distributed in September 1989.

In early March 1990, a preliminary EA was circulated to interested and affected parties for review and comment. The public comment period was extended by request from April 6, to April 20, 1990.

Twenty-nine additional comment letters were received on the preliminary EA. The concerns expressed by commenters were generally the same as those received in earlier comment letters and had been addressed in the Issue Summary and Response to Comments. The additional comments were considered and, where appropriate, incorporated into the EA. The Department of Energy found on June 25, 1990, that the NTSA is not a major Federal action significantly affecting the quality of the human environment, therefore an environmental impact statement (EIS) is not required.

On June 29, 1990, BPA entered into an agreement called the Non-Treaty Storage Fish And Wildlife Agreement (Fish Agreement). The Fish Agreement was signed by BPA and the Columbia Basin Fish and Wildlife Authority (CBFWA), which is comprised of virtually all fishery agencies and Tribes that commented on the NTSA. The Fish Agreement, discussed at greater length in section III.F., is a direct response by BPA to concerns expressed by these interests.

The purposes of the Fish Agreement are (1) to ensure that adverse impacts to fish and wildlife, if any, from the NTSA will be no greater than they would have been in the absence of the NTSA; and (2) to promote cooperation and understanding between fishery agencies and Tribes, and BPA.

## II. ALTERNATIVES CONSIDERED

As part of the EA, BPA evaluated two alternative courses of action; no action and the proposed NTSA.

### A. Take No Action

Under the No-Action alternative as defined in the NTSA EA, BPA and BC Hydro would continue to operate under the existing agreement until it terminates in 1993. This includes shared operation of 2 MAF of Mica non-Treaty storage. At the end of the term of the agreement, non-Treaty storage would be left full.

### B. Implement the Proposed NTSA With BC Hydro

The proposed NTSA would replace the existing NTSA while maintaining many of its provisions. The major changes from the existing agreement are expansion of the volume of available storage in Mica from 2.0 MAF to 4.5 MAF, and extension of the agreement from 1993 to 2003. The proposed NTSA with BC Hydro does not require use of BPA's share of the storage in any particular fashion. Therefore, the agreement leaves open the possibility of using BPA's share of the storage to meet nonpower objectives as well as power needs. This would conceivably include many of the fisheries needs advanced by commenters concerned with those issues.

## III. DECISION FACTORS

### A. Economic Factors

The NTSA provides for four separate types of storage: (1) storage of water into Treaty space above the level that results from Treaty operation; (2) storage of water into inactive storage space to initially fill new reservoirs on the Columbia River and its tributaries in Canada; (3) storage of water in non-Treaty space that BC Hydro may make available from time to time; and (4) storage of water in the 4.5 MAF BC Hydro is obligated to make available (2.25 MAF for use by BPA) during the term of the agreement. The agreement allows and obligates both BPA and BC Hydro to participate, more or less equally, in each of these types of storage. Of the four types, the last one is the most important from an economic standpoint.

The greatest economic benefits to be gained under the agreement result from operation of the 2.25 MAF of storage made available to BPA at Mica. This storage may be operated for opportunity purposes as it has been under the existing agreement, or it may be used as a firm resource if needed. If the storage is used for opportunity purposes, benefits are gained because water can be stored when it has less economic value and released at a time when it has more economic value. There is also expected to be an average annual net gain in energy production of 20 to 40 megawatts (MW) on the system because some energy can be generated from water that otherwise would have been spilled. It is expected that operation of this storage for opportunity purposes would result in economic benefits to the PNW region of approximately \$180 to \$280 million net present value, depending on load growth and future

resource acquisitions. Approximately two-thirds of these benefits are expected to accrue to BPA. The remainder would be realized by the MCP. It is expected that BPA's share of the benefits would be about \$125 to \$200 million net present value. California utilities are expected to gain economic benefits of about \$50 million net present value. Additional purchases from the PNW result in a gain in displacement benefits. Benefits would also be gained by BC Hydro.

The 2.25 MAF of storage may also be used as a firm resource. This storage could represent a firm resource of about 150 MW to the region. There would, however, be a loss of nonfirm energy production. BPA's share of the firm resource would be about 100 MW. If the storage is used as a firm resource, other more expensive resource additions or purchases could be deferred resulting in savings from \$35 million up to \$305 million net present value to the PNW region. The economic value of non-Treaty storage as a firm resource is highly dependent on regional load growth and costs of other resource options. The economic benefits of non-Treaty storage as a firm resource will need to be balanced against the loss of benefits for opportunity storage before the decision to use non-Treaty storage as a firm resource can be made.

In addition, BPA may store water into vacant Mica Treaty space. This is space above the reservoir elevation that results from operating according to the Treaty and below the maximum elevation permitted by flood-control. In general, BPA does not view this right as one that will produce significant monetary benefits and the additional operating flexibility BPA gains from these provisions has not been evaluated in terms of dollars. There probably will be times, however, such as occurred in 1978 and 1980, when Mica will be expected not to refill if it follows the Treaty operation, but the PNW hydro system will have surplus energy. Under these circumstances this agreement will allow BPA to balance the refill of Mica with other reservoirs in the system. Energy that would otherwise be spilled, or perhaps sold as low-priced nonfirm energy, could be stored in the spring and used during the next drawdown season. In this way, BPA might be able to avoid establishing second, third, or fourth year Firm Energy Load Carrying Capability (FELCC) for itself and other utilities in the Coordinated System. If BPA uses this type of storage there will be a per kilowatthour (kWh) service charge for the energy BPA gets back from BC Hydro. Nothing in the agreement obligates BPA to use this type of storage. BPA will have to take these charges into account at the time it decides to store into and request return of energy from this type of storage.

Some obligations to initially fill storage space will be incurred by BPA if any new reservoirs on the Columbia River in Canada are constructed and filled during the term of the agreement. The amount of this potential storage is about 0.3 MAF. BPA's obligation will be to fill approximately one-half of that or 0.15 MAF. If it is assumed that all of the water used for initial filling could have been used to generate power and sold at a price of 22 mills, the cost to BPA would be about \$2.4 million. Some of the obligation to initially fill Canadian reservoirs is also expected to be shared by mid-Columbia participants as future agreements are negotiated with those parties.

No dollar benefits are claimed for the ability BPA may gain to store in non-Treaty space that BC Hydro may make available from time to time under the agreement because there is no assurance that BC Hydro will make any such space available during the term of the agreement. However, BC Hydro has made such space available, in the form of the top 2 feet at Arrow, in 1980, 1981, 1984, and 1985. If 2 feet of space in Arrow is made available by BC Hydro, and if that space is filled with water that is in excess of all markets, release of the water in the following fall would produce about 270 million/kWh of energy. Under the agreement, one-half of the energy would belong to BC Hydro, the other half to BPA and other downstream U.S. utilities. Assuming that the energy could be marketed at 22 mills/kWh, this operation would yield BPA about \$2.1 million. In addition, mid-Columbia utilities would gain energy equivalent to about \$0.9 million. There would be no cost or fees paid by BPA or the mid-Columbia utilities as a result of this operation.

#### B. Operational Factors

The NTSA will provide operating flexibility on BPA's system that would otherwise terminate when the existing agreement expires. Under the Treaty, BPA makes weekly requests for water releases from Treaty space in Canada. This takes the form of a flat weekly release from Arrow across the U.S.-Canadian border. Through the NTSA, BPA is able to make adjustments in water releases from Arrow on a daily basis with concurrent energy transactions with BC Hydro. This provides BPA additional flexibility to meet operating and marketing objectives. This flexibility may be used to maintain a reliable power supply while meeting the increasing level of competing nonpower requirements on the Columbia River.

#### C. Environmental Factors

##### Impacts From the NTSA Will Not Be Significant

In order to evaluate potential environmental effects of the proposed NTSA, BPA conducted extensive modeling studies to determine the effects of the proposal on PNW hydro and thermal system operations. Three approaches were used to estimate potential environmental effects of the proposed agreement. First, operation of the 2.0 MAF of non-Treaty storage space utilized under the existing NTSA was evaluated. Second, the System Analysis Model (SAM) was used to estimate expected operation of the power system over a wide variety of historical water conditions. Third, hydro regulation studies were used to estimate the maximum rate of storage transactions that could occur assuming the 50-year (1929-1978) historical water sequence.

Study results were presented in public meetings and in the NTSA Discussion Paper and public comments were requested. A preliminary EA was also circulated for public review and comment.

After considering the environmental analysis presented in the EA and the comments received on the proposal, the Department of Energy (DOE) found on June 25, 1990, that the NTSA is not a major Federal action significantly affecting the quality of the human environment. This conclusion was based on information and conclusions in the EA, information incorporated from the Intertie Development and Use Final EIS (IDU Final EIS/DOE EIS-0125F), the discussions in the NTSA Issue Summary and Comment Response, and information contained in the comments received. Specific findings supporting this conclusion are as follows:

1. The proposed action is a power marketing function. The NTSA requires no construction or alteration of existing facilities, no direct Federal development, and produces no direct effects on air, land, or water. (FONSI page 4.)

2. Operation of existing Federal dams under the NTSA will be substantially similar to current operation, and the system will continue to operate within all established operating requirements. (FONSI page 4.)

3. Implementation of the NTSA will have no more than minimal effects on environmental resources in the PNW.

a. Anadromous fish survival will not be significantly affected by NTSA-induced changes in flow and spill. The NTSA is expected to decrease Columbia River flow during the spring migration period by a maximum of 10 thousand cubic feet per second (kcfs) out of a typical monthly average flow of 125 to 160 kcfs in the mid-Columbia and 230 to 260 kcfs in the lower Columbia River. Flow rates would remain within limits set both by the Council's Water Budget and the Vernita Bar Agreement. Planned spill as required by the Spill Agreement and by the Federal Energy Regulatory Commission (FERC) will not be affected. The chance of being able to meet maximum spring flow protection levels for fall chinook in the Hanford Reach as required by the Vernita Bar Agreement is greater than 95 percent and will not be changed by the agreement. Moreover, the increased hydro system flexibility provided by the proposed NTSA may make it easier to comply with these spring flow requirements. The NTSA has little effect on predicted survival rates of anadromous fish migrating in the Columbia and Snake Rivers. Average relative system survival changes (positive and negative) are expected to be less than 1 percent for all stocks of fish. (FONSI pages 4 to 6.)

b. Resident fish survival will not be significantly changed. U.S. reservoirs will continue to operate under existing guidelines and requirements, with April through November elevation levels either slightly higher or unchanged. Effects of lowered elevation levels at the Mica reservoir will primarily affect three tributary streams whose contribution to overall reservoir production is likely insignificant. Entrapment of fish and food supply may increase resident fish populations downstream of Mica. The Arrow reservoir level remains unchanged under the NTSA. Council-recommended flow levels for resident fish downstream from Hungry Horse and Libby Dams are also unaffected. (FONSI pages 6 and 7.)

c. Riparian vegetation and wildlife will not be affected. Reservoir fluctuations affecting riparian vegetation and wildlife are not expected. (FONSI page 7.)

d. The NTSA will have no substantial impact on U.S. or Canadian cultural resources. BPA is developing a Programmatic Agreement to mitigate effects at major Federal storage projects, and projects will continue to operate within existing requirements. The Mica sites will remain inundated, and other sites in Canada are already affected and no further effects are expected. (FONSI page 7.)

e. Air quality will not be significantly changed. Projected differences in thermal generation and air pollutants are insignificant in the context of overall thermal generation and air quality standards. (FONSI page 7.)

f. Impacts on ground and surface water are expected to be very small. The largest changes in water use by any thermal plant relative to minimum streamflow or aquifer recharge are less than 3 percent. (FONSI page 8.)

g. Water quality impacts will be insignificant. Water quality impacts from thermal generation are well-regulated. The only area affected in Canada where water quality is a concern is in the Columbia River downstream of Arrow, due primarily to the Celgar pulp mill effluent. Canadian advances in treating pulp mill effluent is improving water quality downstream of Arrow that will improve water quality both with and without the proposed NTSA. (FONSI page 8.)

h. No significant cumulative impacts are expected. The IDU Final EIS provides the benchmark from which to assess cumulative impacts. BPA used SAM to compare cumulative impacts, including past, present, and reasonably foreseeable future actions with pre-IDU EIS Intertie conditions. Cumulative impacts associated with the NTSA, beyond those analyzed in the IDU Final EIS, are expected to be negligible. Decreased overgeneration between April and August is only 3.3 percent beyond that due to Intertie expansion. Increased Intertie capacity did not affect streamflows or reservoir levels; therefore, there is no cumulative impact on the ability to meet the Water Budget or Vernita Bar requirements. (FONSI page 8.)

#### D. Legal Factors

##### 1. Statutory Authority

Statutory authority for the NTSA is the set of BPA's statutory authorities and obligations, found in its four enabling statutes enacted between 1937 and 1980:

- a. the Bonneville Project Act, 16 U.S.C. §§832 et seq.;
- b. the Federal Columbia River Transmission System Act (Transmission System Act), 16 U.S.C. §§838 et seq.;

c. the Act of August 31, 1964 (Regional Preference Act), 16 U.S.C. §§837 et seq.; and  
d. the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act), 16 U.S.C. §§839 et seq.

Two other statutes, the Flood Control Act of 1944, 16 U.S.C. §825s, and the Reclamation Act, 43 U.S.C. §485h, also provide Congressional direction with respect to BPA's mission.

These statutes constitute a "complex web" of authority; they are to be construed in para materia. Dept. of Water & Power v. Bonneville Power Administration, 759 F.2d 684, 685, 695 (9th Cir. 1985). Each statute added to and modified the former as Congress addressed through time the increasingly complex electric power issues in the PNW.

## 2. Final Action

The "final action" for the NTSA occurred at the time the Administrator signed the Agreement itself--on July 9, 1990. The Northwest Power Act §9(e)(5) requires suits to challenge this and similar actions be brought in the Ninth Circuit Court of Appeals within 90 days of the time an action is deemed final. BPA deems the NTSA a "final action" at the time it was signed.

## 3. Equitable Treatment

BPA is required to provide equitable treatment for fish and wildlife in its management and operation of Federal hydroelectric facilities. BPA must protect fish in a manner that provides equitable treatment for fish with the other purposes for which Federal hydroelectric facilities are operated. (Northwest Power Act, §4(h)(11)(A)(i).) This provision describes a balancing test. It requires that BPA give comparable attention to fish and wildlife along with other uses, such as maintaining an efficient, economical, reliable power supply. 16 U.S.C. 839(2)(2).

BPA believes that equitable treatment for fish and wildlife requires a systematic and comprehensive approach to fish and wildlife protection and enhancement in the region. BPA provides equitable treatment in a system-wide manner through the Council's Fish and Wildlife Program and through BPA's implementation of that program and other fish and wildlife measures BPA elects to undertake.

BPA does not agree that every discrete power marketing action requires equal payment or compensation for fish and wildlife. Rather, power marketing activities help fulfill BPA's responsibility to provide an efficient, economical, and reliable power supply, and generate revenues to fund the Fish and Wildlife Program.

BPA is meeting the balancing test and providing fish equitable treatment through the Council's Program by use of flexibility of the Columbia River Power System to meet the Water Budget. The Council developed the Water

Budget for the precise purpose of addressing the change in natural flows caused by dams and hydroelectric projects. The proposed NTSA could improve this flexibility and, therefore, BPA's ability to meet the Water Budget.

Some commenters suggested that BPA should use part of the additional water stored under the NTSA to improve fish flows because section 703(a)(14)(C) of the Northwest Power Council's Fish and Wildlife Program provides that BPA should study "the feasibility of using uncontracted water stored in existing reservoirs" for the purpose of "improving flows for fish." It has been suggested that this provision binds BPA because §4(h)(10)(A) of the Northwest Power Act requires BPA to protect fish in a manner consistent with the Northwest Power Council's Fish and Wildlife Program, and §4(h)(11)(A)(ii) requires BPA to take the Program "into account" "to the fullest extent practicable."

The proposed NTSA, while not specifically dedicating use of non-Treaty storage for fish and wildlife, would enable BPA to take the Council's Program into account and to protect fish in a manner consistent with the Program by improving BPA's flexibility to provide flows for fish in accordance with the Water Budget, the Vernita Bar Agreement, and future flow requirements that may be established. The Council developed the Water Budget to address the problem underlying this comment: dams and hydroelectric projects have altered the natural flows in the Columbia River Basin. Recognizing that compliance with the Water Budget would cause significant loss of power revenues, the Council concurrently encouraged BPA to take actions to reduce or offset the approximately \$40 million annual revenue and power losses associated with the Water Budget. The NTSA is such an accommodation: it can help to offset power losses caused by the Water Budget and at the same time increase system flexibility that can be used to support the Water Budget.

Section 703(a)(14)(C) of the Council's Program does not provide for "additional" flows of water for fish beyond those called for by the Water Budget. Instead, it advises consideration of the use of uncontracted water to "improve" fish flows. Although not reserved for fisheries, the proposed NTSA could improve fish flows by increasing Columbia Power System flexibility, which better enables the provision of flows in accordance with the Council's Water Budget.

#### E. Comments on the NTSA

BPA received 66 comment letters during the NTSA review process. Many of the comments received expressed concern that the proposal would have adverse effects on anadromous fish resources. Other environmental issues raised included effects on resident fish, wildlife, recreation, the Canadian environment, and multiple purpose objectives including Treaty operations. The remaining comments, addressed in the NTSA administrative record, concerned NTSA system operation and constraints, and customer issues relating to Direct Service Industries (DSI) service, economics, and the availability of firm and nonfirm energy.

BPA's analysis indicated the proposed NTSA would have little, if any, effect on anadromous fish resources. Because of the level of concern expressed, however, potential effects of the proposal on anadromous fish were given particular consideration. The major issues raised during the public comment process included (1) potential impacts on anadromous fish survival due to alterations in Columbia and Snake River flows; (2) modeling techniques employed to assess those impacts; and (3) the use of non-Treaty storage to increase flows during the downstream migration period.

#### 1. Flow Issues

There were concerns raised regarding impacts of flow changes on anadromous fish survival. The first involves the relationship between fall spawning flows and subsequent incubation and emergence flows in the Hanford Reach of the Columbia River located downstream of Priest Rapids Dam. This area is also referred to as Vernita Bar and operations in this stretch of the Columbia River are governed by FERC's Vernita Bar Agreement from mid-October through April each year.

The first concern is that flows would be increased in the fall allowing spawning to occur at higher elevations and that flows would be reduced in the spring providing inadequate protection of emerging fry. BPA is committed to meeting operations as required by the Vernita Bar Agreement. The Agreement requires Grant County PUD to shape flows from mid-October through November to try to maintain a low spawning elevation, so long as flows are less than 125 kcfs, and to shape flow through the spring to ensure continuous protection. BPA is required to request flows from Federal projects to provide the weekly average flow for shaping in the spring. The storage provided by the NTSA would not hamper BPA's or Grant County PUD's ability to provide flows at Vernita Bar, as shown in analyses presented in the Non-Treaty Storage Agreement Discussion Paper and the NTSA EA. Results also show that the proposed NTSA would not increase the probability of fall flows being higher than 125 kcfs at Priest Rapids. BPA expects flows under the new NTSA to be similar to those under the existing Agreement and flow changes resulting from the NTSA to be relatively small in all water conditions.

The second flow concern centers around potential flow reductions during the spring and summer juvenile fish outmigration. Commenters fear that reduced spring flows could significantly affect fisheries by slowing the spring migration. As presented in the Non-Treaty Storage Agreement Discussion Paper and the NTSA EA, results of BPA's analyses show that the proposed NTSA would not affect BPA's ability to request flows during spring months as required by the Vernita Bar Agreement, or to provide the required Water Budget flows during migration. BPA remains committed to complying with both of those flow requirements and with the Pacific Northwest Coordination Agreement, that also affects flows. While not obligating non-Treaty storage to specific uses, BPA will use non-Treaty storage to meet operational objectives that may include operations for fisheries, recreation, irrigation, navigation, and flood control as well as power production. BPA and other parties will continue to comply with operating requirements

specified by the Pacific Northwest Coordination Agreement, Water Budget, Vernita Bar Agreement, Spill Agreement, and any other relevant operating requirements.

Flow changes resulting from the proposed NTSA are expected to be the same as under the existing NTSA because operating requirements at Mica, often the limiting factor in non-Treaty storage transactions, are unchanged as a result of the proposal. Projected flow changes resulting from the proposed NTSA are small and are insignificant considering the volume of total flow. During the spring migration period, the maximum flow reduction is about 10 kcfs out of a typical flow in the lower Columbia of over 200 kcfs. Non-Treaty storage is generally filled during periods of high flows, when an additional increment of flow might not provide an additional benefit to migration. In many cases, non-Treaty storage is released as flows drop in the summer.

In addition, regulating flow is not the only fisheries mitigation measure BPA performs, and we would not expect flows to fully protect juvenile fish without these other measures (hatchery programs, habitat enhancement, and research, for example).

BPA estimated the effects of the proposed NTSA on anadromous fish survival using the FISHPASS model. FISHPASS reflects the best scientific and biological information available on juvenile fish migration and on the relationships between flows, project spill, dam bypass facilities, transportation, and fish survival. Results of these analyses indicated that the proposed NTSA would have little effect on anadromous fish survival.

Despite continuing dialog with fisheries agencies and Tribes on the flow issue, and BPA's confidence that the proposed NTSA would not have adverse effects on anadromous fish survival, fishery interests remained concerned that the proposal would harm anadromous fish. Due to the continuing concern of the fish community, BPA negotiated the Fish Agreement with all PNW State and Federal fish and wildlife agencies and 13 Indian Tribes. These are the members of CBFWA. The agreement was approved without dissent. The Fish Agreement provides mechanisms to communicate on a regular basis with fish and wildlife interests and to obtain feedback on the effects of the NTSA on fish and wildlife resources. This agreement, described in greater detail in section III.F., also assures that significant adverse impacts to fish and wildlife will not occur from the NTSA.

## 2. Analytical Issues

Another issue that was raised concerned the analytical process that supported BPA's conclusion that the NTSA would have no significant impact on fish survival. The primary issue was whether the FISHPASS and SAM simulation models were reliable predictors of potential effects of the NTSA on anadromous fish survival.

Several commenters claimed that BPA's use of the FISHPASS model was inappropriate. One reason cited was the General Accounting Office's (GAO) call for review of the model. The GAO investigation found no problems or serious flaws in FISHPASS that precluded its use for impact analyses, however. The GAO investigation simply recommended an independent review and

documentation of the model. It did not preclude the model's use during the review. Independent review by the University of Washington suggested improvements to FISHPASS, but concluded that it is the best tool currently available for evaluating fishery impacts resulting from changes in hydro system operations.

Several comments also expressed concern that FISHPASS results were based on inadequate data and unsubstantiated assumptions. BPA uses the best biological data available. FISHPASS parameters and assumptions are provided by the Council's Mainstem Passage Advisory Committee and fishery experts of the U.S. Army Corps of Engineers (Corps) and mid-Columbia utilities. Because FISHPASS analyzes the relative change in smolt survival between a base case and an alternative case, input variability is not critical to the results. In type of comparative analysis, errors in the dependent variables cancel each other out. BPA believes it is reasonable to rely on a quantitative tool to analyze potential relative changes in impacts between alternatives. All models must simplify the complex systems they simulate. FISHPASS is the best method available for assessing potential changes in hydrosystem operations, and the effects of these changes on migrating smolts. (Issue Summary and Response to Comments page 41.)

SAM was criticized because it is unable to model weekly or daily operation of the regional power system, and it was claimed that the monthly average analysis conducted could mask serious impacts on fish survival levels. At this time there is no model available to predict daily system operations on a long-term basis. BPA chose SAM in part because it incorporates non-Treaty storage logic, models BC Hydro's operation, and incorporates extra-regional marketing into its basic analysis; features missing from other hydroregulation models. Thus, SAM is the most accurate model available to analyze the effects of the NTSA. FISHPASS shapes monthly average flows from SAM into daily values using a flow modulator based on historical daily flows. Therefore, fish survival values account for daily variations in flow.

To verify SAM results, BPA analyzed 5 years of daily operational data from the existing NTSA to establish the magnitude of monthly average changes. In the case of non-Treaty storage, the maximum amount of daily change in flow that can occur is limited by operations at Mica and Arrow, and rarely exceeds 10 kcfs during the juvenile fish migration season. Thus, meaningful and relevant data on daily operations was evaluated for potential environmental effects. Because flow changes into the U.S. system are constant for all hours each day, as are most energy schedules under the Agreement, BPA expects no change in hourly flow patterns from the proposed NTSA.

The underlying assumptions used to estimate potential impacts are summarized in the Non-Treaty Storage Agreement Discussion Paper, the EA, and additional detail was included in response to one commenter, which is included as part of this record. Other information related to FISHPASS assumptions was included in the IDU Final EIS.

Commenters questioned the capability of modeling to predict future operations. The NTSA analysis addressed the problem of imperfect foresight in several ways: by using 200 SAM simulations; by interpreting study results on a comparative basis; and by performing sensitivity analyses. (Issue Summary and Response to Comments page 41.) Sensitivity analyses were performed to test the uncertainty of model results with respect to key FISHPASS model parameters and SAM assumptions. Many of the FISHPASS model parameters were tested for their sensitivity in the Final IDU EIS, and were shown to have little or no impact on the results. For the NTSA EA, BPA performed a sensitivity analysis on the reservoir mortality variable, that varies with flow. Again the analyses showed that variations in key assumptions make little difference when model results are used for comparing alternatives instead of predicting absolute survival levels. Sensitivity analyses were also performed on several SAM assumptions such as PNW loads, and California gas prices.

A related criticism was that maximum or extreme conditions, --the "worst cases"--could not be encompassed by the random game approach used in SAM. The NTSA studies used 200 SAM simulations for 20 years. This wide range of possible occurrences makes it possible in the modeling to exceed events observed in historical sequences. It is not necessary to predict every future occurrence to assess the potential impact of the NTSA. (Issue Summary and Response to Comments page 47.)

Other commenters suggested that BPA analyze specific flow levels or additional hard constraints to provide additional fisheries flows. Analysis of such additional constraints would not provide the information necessary to determine the effects of non-Treaty storage, and analysis of a revised flow regime is outside the scope of the non-Treaty impact assessment. The System Operation Review (SOR) EIS, currently being scoped, is an appropriate forum for discussion of additional system requirements for fisheries and other nonpower uses of the Columbia River system.

Comments also suggested that BPA should model cumulative effects of survival changes on fish life cycles. This type of model would require values for ocean survival, estuary survival, harvest, spawning, and rearing. Little or no data are available for these parameters on a life cycle basis (approximately 4 years). In addition, the effects of the NTSA are so minor that they would be lost in a life cycle analysis, overshadowed in particular by the uncertainty introduced by these new parameters.

### 3. Use of Non-Treaty Storage to Enhance Flows for Anadromous Fish

Many commenters argued that use of NTSA flexibility to benefit fish should be considered as an alternative in the NTSA assessment, and that unresolved conflicts concerning this alternative mandate preparation of an EIS under NEPA, 42 U.S.C. 4332 (E). BPA did not consider this alternative for several reasons.

First, the NTSA does not specify any use for the added flexibility. It only makes the flexibility available. There are no unresolved conflicts concerning alternative uses of this resource because the NTSA does not compel any particular allocation.

Second, the NTSA does not harm fish even if the added flexibility were used only for power. The increased flexibility allows BPA to better meet all the demands placed on the Federal Columbia River Power System (FCRPS), including power requirements, the Water Budget, and the Vernita Bar Agreement. Use of non-Treaty storage to meet nonpower objectives is an option that will be examined in the SOR EIS. In the SOR, all uses of the Columbia River system to meet competing needs will be discussed.

Third, the Council encouraged BPA to take actions to reduce or offset revenue and power losses resulting from Water Budget compliance. The NTSA helps BPA support the Water Budget "while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply" (Northwest Power Act sections 2(2), 4(h)(5).) Because BPA has already provides fish flow through the Water Budget, there is no unresolved conflict concerning alternative uses. (Summary and Response to Comments pages 7-8.)

Finally, using NTSA solely to benefit fish would not meet the underlying need for marketable energy identified in the EA. BPA stated this need because nonpower uses of the Columbia River, including the Water Budget, Vernita Bar Agreement, and Spill Agreement, have diminished the system's ability to supply marketable energy. By law, BPA must meet the demand for electricity. Allocating non-Treaty storage space solely for the benefit of fish, or any other particular use, would impair system flexibility. It would not meet the underlying need.

#### F. The NTSA Fish and Wildlife Agreement

In order to better address the concerns of the fisheries community with respect to the proposed NTSA and to promote a cooperative environment to more broadly address fisheries and power issues, BPA entered into a Fish Agreement on June 29, 1990. The Fish Agreement was signed by BPA and the CBFWA, which is comprised of nearly all of the PNW State and Federal fish and wildlife agencies and Indian Tribes that commented on the NTSA. Among other things, the Fish Agreement provides that:

1. BPA will develop annual operating guidelines, in consultation with CBFWA, for the use of non-Treaty storage that assure:
  - a. current flow requirements specified by the Water Budget,
  - b. flows specified by the Vernita Bar Agreement, and
  - c. adverse effects on fish and wildlife, if any, will be no greater than would have occurred in the absence of non-Treaty storage.

2. Initial operating guidelines are to be adopted within 80 days after execution of the NTSA or signature of the FONSI. If any member of CBFWA disagrees with the initial operating guidelines, the Fish Agreement is void.
3. Accounting mechanisms will be developed by BPA, and agreed to by the parties, so that NTSA operations can be monitored for consistency with the operating guidelines.
4. BPA will promptly fund the Idaho Department of Fish and Game (IDFG) to conduct a feasibility/coordination study, for an amount not to exceed \$80,000. The study will examine the feasibility and effects of renting water from Idaho water banks for the purpose of Snake River anadromous fish improvement. An oversight and study team will consist of representatives from the Shoshone-Bannocks, Nez Perce, BPA, and the IDFG.
5. Contingent upon the occurrence of certain specified determinations by the study team, BPA will promptly increase its Fiscal Year (FY) 1991 Fish and Wildlife Program budget by \$1 million to establish a pilot project to rent Idaho water for the purpose of fish flow improvement on the Snake River.
6. Contingent upon the occurrence of certain conditions regarding the success of the pilot program, BPA will budget at least \$1 million in FY's 1992 and 1993 for renting Idaho water.
7. To improve communications and understanding of the power supply system, BPA will finance a person employed by CBFWA to be housed within the BPA Division of Power Supply, who will be provided with regular access to top level decisionmakers and decision processes within BPA's Division of Fish and Wildlife and Division of Power Supply.
8. If disputes arise during the course of the Agreement, the parties agree to first exhaust informal dispute resolution processes, and next to submit any disputed matters to nonbinding mediation. Judicial review is a last resort.
9. BPA and the CBFWA members agree to use their best efforts to establish ground rules by September 30, 1990, for an effective working relationship between each other, and the two Federal agencies responsible for operating the Federal dams (the Corps and the Bureau of Reclamation).
10. The NTSA will be discussed within the context of the recently initiated SOR EIS. The Fish Agreement may be revised as necessary and appropriate in light of the SOR EIS.

In addition, in a letter to the BPA Administrator, CBFWA stated that the Fish Agreement satisfies all concerns raised by the CBFWA members during the course of the NTSA public process, and that they view the NTSA, in conjunction with the Fish Agreement, as a "win-win" situation--a benefit for power, a benefit for fish, and a benefit for the region. BPA agrees.

#### IV. ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS

##### A. National Environmental Policy

BPA prepared an EA and FONSI pursuant to the National Environmental Policy Act (42 USC 4321 et seq.) and implementing regulations. The EA and FONSI contain a full and complete description of the proposed actions, analysis of reasonable alternatives, and foreseeable environmental consequences of the proposed actions and alternatives. The same level of analysis and public process was used as would have been used had an EIS been prepared. No environmental information was left out of the EA and FONSI that would have been included in an EIS.

##### B. Endangered and Threatened Species and Critical Habitat

BPA consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the potential effects of the proposed NTSA on plant and animal species and critical habitat protected by the Endangered Species Act (16 USC 1536). A list of species is included in the Technical Report, Appendix J. A Biological Assessment analyzing the effects of the project on the listed species was prepared and forwarded to the USFWS. The USFWS agreed with BPA's opinion that the proposed NTSA is not likely to affect the Federally-listed species or their habitats.

BPA is aware that several species of salmon have been petitioned for listing as endangered or threatened species. That petition imposes no new procedural obligations on BPA. If the species are ultimately listed, BPA will then take the steps needed to comply with the Endangered Species Act. The biological status of those species was taken into account in BPA's environmental analysis. No significant impact on those species is expected as a consequence of the NTSA. The impact on any species petitioned for listing under the ESA is the same with or without the proposed NTSA.

##### C. Fish and Wildlife Conservation

Because fluctuations in reservoir elevations caused by the proposed NTSA are minimal, changes which could affect vegetation or fish and wildlife will not occur under either of the alternatives.

Considering:

1. changes in impacts of operating Federal hydroelectric facilities would be insignificant
2. the need to assure an adequate, efficient, economical, and reliable power supply; and

3. BPA's ongoing and substantial investments in fish and wildlife protection, mitigation, and enhancement (in particular considering the continuing increases in fish passage survival);

BPA is meeting its obligation to provide equitable treatment for fish and wildlife.

BPA has consulted with fish and wildlife agencies for each of the states in the region, and has taken into account their comments. The Fish Agreement alleviates the concerns of the Federal and State fish agencies and Indian Tribes in the region.

#### D. Heritage Conservation

BPA is in the process of developing a Programmatic Memorandum of Agreement with the Advisory Council on Historic Preservation; the Idaho, Montana, and Washington State Historic Preservation Officers; the Bureau of Reclamation; the Corps; and others to survey, evaluate, and protect potentially affected cultural resources at the five major Federal storage reservoirs. Although this Programmatic Agreement was initiated as mitigation for potential impacts on these cultural resources from marketing activities analyzed in BPA's IDU Final EIS, it will satisfy BPA's responsibilities under Section 106 of the National Historic Preservation Act (16 USC 470) for the proposed NTSA and will also ensure BPA's consistency with the American Indian Religious Freedom Act (42 USC 1996).

#### E. Floodplain and Wetlands Protection

Neither alternative will affect floodplains or wetlands any more than what already occurs under the existing operation of the FCRPS. The NTSA will result in no net loss of wetlands.

#### F. Recreation Resources

Neither alternative substantially affects any component of the National Wild and Scenic Rivers System or the National Trails System; a U.S. Forest Service or Wilderness Area or roadless area; a Bureau of Land Management Wilderness Area or Area of Critical Environmental Concern; or a park or other area of ecological, scenic, recreational, or aesthetic importance. Neither alternative converts property acquired or developed with assistance from the Land and Water Conservation Fund to other than outdoor public recreation uses.

#### G. Permits

Neither alternative includes a structure or work in, under, or over a navigable water of the U.S.; a structure or work affecting a navigable water of the U.S.; or the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the U.S. Neither alternative includes discharge of dredged or fill material into waters of the U.S. Therefore, no permits are needed from the Corps.

The proposed NTSA does not require any change in the use of public lands and no permit for a right-of-way across such lands is required.

H. State, Areawide, and Local Plans and Program Consistency

Neither of the alternatives includes any Federal financial assistance or direct Federal development and neither is affected by any State, areawide, or local plans, programs, or projects. In accordance with Executive Order 12372, the NTSA Preliminary EA was circulated to clearinghouses for State and local agency review and consultation.

I. Clean Air and Water Act

Neither of the NTSA alternatives is affected by air quality standards promulgated under National Ambient Air Quality Standards (primary and secondary), State Implementation Plans, New Source Performance Standards, Class I designations, National Emission Standards for Hazardous Air Pollutants, or emission limitations in air quality control laws or regulations.

Neither alternative will result in the discharge of pollutants into the waters of the U.S. either from point or nonpoint sources. Therefore, the provisions of the Clean Water Act are not applicable.

J. Other

The requirements of the following acts were also considered and found to be not relevant: Coastal Zone Management Act; Farmland Protection Policy Act; contract compliance provisions of the Clean Air and Clean Water Acts; Safe Drinking Water Act; Resource Conservation and Recovery Act; Noise Control Act; Federal Insecticide, Fungicide, and Rodenticide Act; and Toxic Substances Control Act. In addition, neither alternative affected energy conservation at Federal facilities.

V. **RELATED DOCUMENTS**

1. Non-Treaty Storage Agreement Discussion Paper
2. Non-Treaty Storage Agreement Issue Summary and Response to Comments
3. Non-Treaty Storage Agreement EA
4. Non-Treaty Storage Agreement Technical Report and Appendices
5. Finding of No Significant Impact
6. Non-Treaty Storage Fish and Wildlife Agreement
7. Non-Treaty Storage Agreement
8. Intertie Development and Use EIS
9. Documents related to the 1984 agreement

## VI. CONCLUSION

The NTSA has economic benefits to the PNW, B.C. Hydro, and, potentially to California. The NTSA has operational benefits. It will not result in significant adverse environmental impacts. All procedures required by law have been met. The EA and a FONSI prepared by BPA on the proposed action have been approved by DOE. BPA has reached an accord with the majority of organizations responsible for fish and wildlife in the region, who agree that the NTSA, on balance, will help meet the need for low-cost electrical power while adequately protecting the fish and wildlife resources of the PNW.

For the reasons stated above, I have decided to proceed with the Non-Treaty Storage Agreement, BPA Contract No. DE-MS79-90BP92754 with B.C. Hydro relating to additional uses of Treaty and non-Treaty storage space in Canada.

A handwritten signature in cursive script, appearing to read "James J. [unclear]". The signature is written in black ink and is positioned centrally on the page.