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34 UNITED STATES DISTRICT COURT  
35 DISTRICT OF OREGON

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37 NATIONAL WILDLIFE FED'N, et al., )  
38 ) Civ No. 01-0640-RE (lead Case)  
39 Plaintiffs, ) CV 05-0023-RE  
40 v. ) (Consolidated Cases)  
41 )  
42 NATIONAL MARINE FISHERIES SERVICE) Declaration of ROCK PETERS  
43 )  
44 and UNITED STATES ARMY CORPS OF )  
45 ENGINEERS, and U.S. BUREAU OF )  
46 RECLAMATION, )

1 Defendants,

2  
3 and

4  
5 NORTHWEST IRRIGATION UTILITIES, PUBLIC  
6 POWER COUNCIL, WASHINGTON STATE FARM  
7 BUREAU FEDERATION, FRANKLIN COUNTY  
8 FARM BUREAU FEDERATION, GRANT COUNTY  
9 FARM BUREAU FEDERATION, AND STATE OF  
10 IDAHO,

11  
12 Intervenor-Defendants.  
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14  
15 \_\_\_\_\_  
16 I, Rock Peters hereby state and declare as follows:

17 1. I work for the U.S. Army Corps of Engineers (Corps) Northwest Division (Division) as a  
18 Fishery Biologist. I am currently the Senior Program Manager for the District Support Team for  
19 fish related issues in the Columbia River Basin. I have been in this position since December 27,  
20 2004. My primary duties include overseeing and providing strategic guidance and direction to  
21 multi-district projects directed at improving dam and reservoir survival of fish.

22 2. Previously, I worked for the Corps at the Portland District Office as a Fishery Biologist. I was  
23 the Anadromous Fish Evaluation Program (AFEP) Coordinator for Portland District. As part of  
24 my duties I developed the District's research priorities, chaired AFEP committees and coordinated  
25 regional, Division, and District technical activities. I was in this position from February 1999 to  
26 December 2004. I was also the Environmental Resources Fish Passage Team Leader, overseeing 7  
27 fishery biologists. I was responsible for establishing team priorities and overseeing their work.

28 3. Between December 1987 and February 1999, I was a Fishery Biologist in the Environmental  
29 Resource Branch, Portland District, responsible for fishery technical support and input to District  
30 planning and engineering activities. I provided fisheries input for all aspects of pre-authorization  
31 studies, pre-construction planning, and other District activities. I also served as study manager and

DECLARATION OF ROCK PETERS

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1 coordinator on various fish research studies on the Columbia, Willamette, and Rogue rivers. From  
2 1982 to January 1987, I worked as a Fishery Biologist for the Corps on adult passage evaluations  
3 at Lower Monumental, Ice Harbor, McNary, John Day, and Bonneville dams. From 1985 -  
4 1987, I served as the Operations Biologist at Bonneville Dam.

5 4. I earned a Bachelor of Science degree in Wildlife Science from Oregon State University in  
6 Corvallis, Oregon in 1977.

7 **Plaintiffs' Suggested Operation Effects**

8 5. This document provides relevant information concerning the plaintiffs' Motion for  
9 Preliminary Injunction and in particular the declarations of Stephen W. Pettit and Frederick E.  
10 Olney and suggested changes to the Corps' summer spill operations. The Action Agencies'  
11 Updated Proposed Action (UPA) was analyzed in NOAA Fisheries 2004 Biological Opinion  
12 (2004 BiOp) (NOAA A.R. A1). The BiOp provided extensive quantitative model analyses and  
13 was based on years of research results that were relied on in concluding the actions contained in  
14 the UPA avoided the likelihood of jeopardizing the continued existence of listed salmonids;  
15 including the summer spill operations contained in the UPA.

16 6. In contrast, the effectiveness of the plaintiffs' suggested summer spill operation alternative is  
17 not quantitatively evaluated in the supporting declarations. Plaintiffs provide no quantitative  
18 demonstration of whether, or to what extent, the plaintiffs' recommended alternative operations  
19 will improve either smolt survival through the FCRPS or the survival rate of returning adults.  
20 Indeed, in my opinion, the requested operations would have less benefit to salmonids as  
21 compared to the operations that the Action Agencies will undertake under the UPA.

22 7. The Corps has sponsored biological studies since 1952 in an integrated, applied research  
23 program to better understand and improve anadromous fish passage conditions at the eight

1 mainstem Columbia and Snake River projects. These monitoring, research, and evaluation  
2 studies are managed under the Anadromous Fish Evaluation Program (AFEP). The purpose of  
3 AFEP is to produce scientific information to assist the Corps in making engineering, design, and  
4 operational decisions for safe efficient passage through the Snake and Columbia rivers migration  
5 corridor. Each study typically undergoes a year-long collaborative planning process that  
6 develops, prioritizes, and reviews study plans with the regional agencies and Tribes. This process  
7 is subject to considerable regional scrutiny to ensure the studies are well founded and will  
8 provide results that will assist in making design and operational decisions using the best  
9 scientific information. In addition, the System Configuration Team (SCT), as part of the NMFS  
10 Regional Forum, prioritizes funding for the studies that are conducted annually through the  
11 AFEP process.

12 8. The declarations from Pettit and Olney suggest that spill is generally the safest route for fish  
13 passage. These declarations primarily rely on available information pertaining to spring Chinook  
14 and then assert, without supporting data, that fall Chinook survival will increase under spill  
15 conditions at the lower Snake River projects. Currently, there is little information on project or  
16 spill survival for fall Chinook at lower Snake River Projects.

17 9. The Pettit and Olney declarations assert there is technical foundation for implementing the  
18 alternative summer spill operation suggested by the plaintiffs. They discuss the perceived  
19 benefits, but do not discuss the biological risks associated with their proposal. This is in contrast  
20 to the NOAA Technical Memorandum (Ferguson et al. 2004) (NOAA A.R. B.80), which  
21 comprehensively reviewed spill survival information and was used as the foundation for crafting  
22 the summer operation specified in the FCRPS 2004 BiOp.

23 10. In making decisions on spill operations, several factors must be considered in ensuring safe

1 spillway passage of smolts at each of the FCRPS projects. These factors include: the quantity of  
2 spill; the percent total dissolved gas (TDG) produced; and, project specific information on  
3 approach conditions in the forebay, conveyance through the spillway, and hydraulic egress  
4 conditions through the tailrace. The Pettit and Olney declarations fail to even acknowledge these  
5 factors or their effects on spill survival or overall project survival.

6 11. Over the course of the last 13 years, the Action Agencies have taken into consideration the  
7 above factors in making determinations about utilizing spill at various projects. In this process  
8 we have learned that extensive use of spill is not necessarily beneficial to fish. For example,  
9 Ferguson et al. (2004)( NOAA A.R. B.80) noted that in 1998 at the Dalles Dam, subyearling  
10 chinook survival dropped from 92% to 76% when spill was increased from 30% to 64% of the  
11 total river flow. In 2000 at The Dalles Dam, spillway survival was estimated at 92% with 40%  
12 spill. Therefore, at The Dalles Dam, quantity of spill is an important consideration in making a  
13 determination about the best smolt passage operation.

14 12. At John Day Dam, biological tests indicate similar results and additionally suggest that the  
15 quantity of spill can affect other juvenile passage routes. In 2003, for subyearling Chinook, 30%  
16 spill of river flow, 24 hours per day, resulted in higher survival than 60% spill at night-time only  
17 (A.R 243). All passage routes (spillway, sluiceway, turbines, and project survival) resulted in  
18 higher survival rates for the lower spill condition. In addition, it was determined the higher spill  
19 condition negatively affected the survival of subyearling fall Chinook passing through the  
20 juvenile bypass system. Essentially, the higher spill condition resulted in an eddy being formed  
21 drawing bypass released fish into a slack water area and delayed the juveniles exiting the  
22 tailrace. This condition yielded lower survival rates for subyearling fall Chinook passing  
23 through the bypass system and was likely a result of increased predation.

1 13. Biological tests at Bonneville Dam conducted in 2004 indicate that the spillway may not  
2 always be the best juvenile survival route. Yearling Chinook results suggest the spillway  
3 survival was the lowest of all the available juvenile passage routes (A.R. 100). The juvenile  
4 bypass system (97%), turbines (95%), and Bonneville corner collector (100%) all had higher  
5 survival rates than the spillway (91%).

6 14. Testing was also conducted in 2004 at Bonneville Dam for subyearling fall Chinook. The  
7 test strategy was to look at two levels of spill and the corresponding survival through each of the  
8 juvenile passage routes. Subyearling Chinook information in 2004 resulted in higher survival  
9 through the Bonneville corner collector than through the spillway under all test conditions. The  
10 Bonneville juvenile bypass system had higher survival than spillway passed fish for most of the  
11 conditions tested. At the lower spill levels tested, spillway survival was about 76% and overall  
12 project survival decreased, suggesting that there is likely a lower level spill threshold where  
13 survival of subyearling fall Chinook drops to very low levels ( A.R. 100).

14 15. These studies described above suggest that overall project operating conditions need to be  
15 carefully considered to ensure good juvenile passage survival. The Pettit and Olney declarations  
16 do not consider the levels of spill and other factors that may result in poor juvenile survival  
17 through the spillway at any particular project. They suggest that spill during the summer will  
18 increase survival by reducing the residence time in the forebay. While there is evidence in recent  
19 research that spill may reduce forebay residence time at some projects, in anticipation of low  
20 flows in 2005 during the fall Chinook migration, increased summer spill may actually decrease  
21 project survival if flows are not adequate to move fish through the tailrace. In addition there is  
22 considerable uncertainty whether spill and in-river passage is safer for Snake River fall Chinook  
23 than transportation through the entire system.

1 16. The empirical Snake River fall Chinook information that is available is from studies at Ice  
2 Harbor Dam, which indicates dam passage survival is lower for subyearling fall Chinook than  
3 spring Chinook. Dam passage routes for migrating fish include bypass facilities, spillways, and  
4 turbines. In 2004, Ice Harbor studies indicated dam passage survival for Snake River fall  
5 Chinook was about 88%, compared to 93% for spring Chinook (A.R. 100).

6 17. Biological tests at Bonneville Dam conducted in 2004 indicate that project survival for  
7 subyearling fall Chinook ranged from 82%-89% and spring Chinook project survival was 95%  
8 (A.R. 100).

9 18. Based on the significant survival differences that occur between stocks with respect to  
10 passage routes at different projects in the lower Columbia River, it is not scientifically sound to  
11 extrapolate survival for the Snake River fall Chinook from the information available on other  
12 salmonid stocks. Thus, the Declarants' attempts to rely on data regarding spring/summer  
13 Chinook are not properly supported.

14 19. In addition to failing to provide quantitative survival data on their recommended spill  
15 operations at the lower Snake River projects, the Pettit and Olney declarations also fail to discuss  
16 the biological *risks* to different salmonid stocks associated with their suggested action.

17 20. The declarations from Olney and Pettit suggest moving forward with a summer spill  
18 operation in the lower Snake River during the 2005 fall Chinook outmigration without regard to  
19 a regionally agreed to comprehensive study to evaluate the effects of the action. In my opinion,  
20 this is scientifically unsound, and may put this species at higher risk than the current plan. The  
21 plaintiffs' recommended summer spill operation would significantly reduce the number of  
22 juvenile fall Chinook that could be collected and transported. The best available scientific data is  
23 consistent with maximizing transport – particularly in light of the probable low water conditions

1 and likely higher water temperatures.

2 21. The declarations from Pettit and Olney fail to address impacts of their proposed operation on  
3 Total Dissolved Gas supersaturation (TDG). Henriksen's declaration provides information on  
4 the potential levels of TDG anticipated under the plaintiffs' recommended operation. TDG  
5 supersaturation can be detrimental to fish survival when the quantity of spill is excessive. TDG  
6 can reach hazardous levels, posing a risk to all aquatic biota, including adult and juvenile  
7 salmonids. The effect of TDG supersaturation is very complex and depends upon several factors  
8 including the level of TDG supersaturation, amount of exposure time, water temperature,  
9 physical condition of the fish, and the swimming depth of the fish. All of these factors  
10 contribute to the conditions under which fish may be exposed to uncompensated levels of TDG  
11 that may result in Gas Bubble Trauma (GBT) symptoms that are harmful or fatal to fish. The  
12 health risk associated with TDG exposure drops considerably as the water quality standard of  
13 110% is approached. The UPA and the FCRPS 2004 BiOp have specific volume TDG caps  
14 specified to minimize risk to ESA listed fish and other aquatic organisms. Proposing specific  
15 spill levels, without providing TDG constraints, would be detrimental to listed fish during low  
16 river flows in the summer.

17 22. The Pettit and Olney declarations do not adequately address the potential survival risk to  
18 listed fish due to elevated TDG. They oversimplify their suggested operation by advocating for  
19 spilling the entire volume of the river with flows in excess of station service, and then later note  
20 "there is little or no risk that the increased spill in the lower Snake and at McNary will increase  
21 dissolved gas in the water to levels of concern but if for any reason it did, spill could certainly be  
22 limited to stay within the gas caps that have been set for past operations" (Pettit paragraph 49).  
23 With the anticipated low flow conditions this year, and the suggested spill, the gas caps would be



1 exceeded in the lower Snake River. Particularly, even minimal spill at Lower Monumental  
2 would exceed the 120% TDG (*see* Henriksens' declaration).

3 23. To obtain scientifically based information on how to improve passage conditions and  
4 survival of listed fish, the Action Agencies are moving forward with studies to evaluate and  
5 better understand the needs of fall Chinook for safe passage in the Snake River. Currently, the  
6 Corps is planning studies for fall Chinook in 2005 at Ice Harbor and Lower Granite dams to  
7 gather baseline information on project survival. The Corps is also planning to conduct a  
8 comprehensive evaluation of summer in-river passage versus transportation of juvenile  
9 salmonids at the lower Snake River projects, which is scheduled for testing in the 2007/08 time  
10 frame (A.R. 121). The comprehensive in-river versus transport study is scheduled for this time  
11 period to allow for an evaluation with optimum in-river passage conditions. This would include  
12 either optimizing spill or completing the installation of surface flow bypass, such as Removable  
13 Spillway Weirs (RSW's) at the lower Snake River projects.

14 24. There are alternatives to high spill discharge available that the region has been investigating  
15 to enhance smolt passage survival, improve kelt passage<sup>1</sup>, reduce spill, and minimize TDG.  
16 Currently, fish passage spill is accomplished by releasing water and migrating fish under spill  
17 gates which are at depths of 40 to 50 feet. The RSW is a particular configuration of a surface  
18 bypass system that is designed to fit on the face of existing spillways. The objective of the RSW  
19 is to offer a surface outlet to smolts by taking advantage of their surface oriented behavior (i.e.,  
20 allowing them to be passed closer to the surface rather than drawn down to the spill-gate level).  
21 Ice Harbor and Lower Granite Dams currently have RSW's installed and positive results for  
22 juvenile spring Chinook survival have been demonstrated at Lower Granite Dam, and testing is

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<sup>1</sup> Adult steelhead that migrate back to the ocean after spawning

1 beginning this year at Ice Harbor. To date, RSW's have not been tested for subyearling fall  
2 Chinook passage or survival.

3 25. Regional agreement on the summer in-river versus transport study plan for fall Chinook has  
4 not yet been reached. However, collaborative discussions are presently being held with state and  
5 tribal salmon co-managers, the Corps, NOAA and BPA in an effort to ensure that the scientific  
6 data is collected and analyzed in a manner acceptable to the regional experts. This study is meant  
7 to provide information on the most biologically effective management option for Snake River  
8 fall Chinook, taking into account the authorized project purposes of the FCRPS.

9 26. Little information currently exists concerning subyearling fall Chinook passage at projects  
10 in the lower Snake River, therefore the Action Agencies believe it is prudent to gather additional  
11 information prior to initiating the comprehensive in-river versus transport study. The Corps is  
12 planning several research and monitoring activities under AFEP during 2005 which will include  
13 subyearling fall Chinook passage at several projects. Project survival studies are planned for  
14 Bonneville, The Dalles, Ice Harbor, and Lower Granite dams during the summer outmigration.  
15 The Ice Harbor and Lower Granite testing will evaluate spill under two operating conditions to  
16 determine subyearling passage distribution and survival with and without an RSW to determine  
17 the best potential operation for in-river migrating fish in the lower Snake River.

18 **Plaintiff's Suggested Operation Effects on Planned Research**

19 27. The plaintiffs suggested operation plan for 2005 will impact the AFEP study plans for fall  
20 Chinook testing at Ice Harbor and Lower Granite dams. To increase water particle travel time,  
21 the Pettit declaration suggests going to 10 feet below MOP at Lower Granite Dam. This would  
22 render the RSW at Lower Granite unusable (*see*, Ocker's declaration) and it would not be  
23 possible to proceed with the regionally accepted study plan at Lower Granite.

1 28. The plaintiffs' suggested summer spill operation, i.e. spilling all flow in excess of station  
2 service at the Snake River projects, will also impact the Ice Harbor and Lower Granite tests. The  
3 intent of each of the tests is to determine the optimum spill levels for fall Chinook passage at  
4 these projects. The test designs for Ice Harbor and Lower Granite have gone through extensive  
5 regional discussions and have been agreed to by the regional agencies and Tribes. Disrupting the  
6 planned research could impact the initiation of the comprehensive transport versus in-river fall  
7 Chinook study that relies on results of these tests.

8 **Summary**

9 29. In summary, I believe the proposed operation outlined in the UPA and the FCRPS 2004  
10 BiOp provide less risk to the Snake River fall Chinook population than the plaintiffs' suggested  
11 operation. Considerable uncertainty exists on fall Chinook passage survival at lower Snake  
12 River Dams, and consistent with the 2004 BiOp, I believe that it is prudent to acquire  
13 information on optimizing in-river passage conditions and test the transport versus in-river  
14 condition prior to initiating a significant change. To do otherwise would unnecessarily put the  
15 listed fish at risk. The declarations provided by plaintiffs do not adequately address factors that  
16 negatively impact fall Chinook passage, nor do they demonstrate how their proposed alternative  
17 would improve either smolt survival or adult returns.

18 30. Pursuant to 28 U.S.C. § 1746, I declare under the penalty of perjury that the foregoing is true  
19 and correct to the best of my knowledge, based on my education, experience and professional  
20 judgment. Executed April 21, 2004, at Portland, Oregon.

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23 

24 Rock Peters  
25 Fisheries Biologist, U.S. Army Corps of Engineers