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CORPORATE HEADQUARTERS

May 22, 2014

SENT VIA EMAIL TO: paula.wilson@deq.idaho.gov

Ms. Paula Wilson
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83

Dear Ms. Wilson:

The Idaho Department of Environmental Quality is considering revisions to the section of the water quality standards pertaining to mixing zones (i.e., Mixing Zone Policy). The J.R. Simplot Company (Simplot) has numerous facilities in Idaho engaged in food processing, fertilizer manufacturing, mining, and other agriculture-related operations. Some of these operations have NPDES permits, stormwater permits or discharge to municipalities that do have discharge permits. Thus, Simplot has a direct interest in the proposed changes to the Mixing Zone Policy.

Simplot has the following comments on the proposed changes.

Impaired Waters

The language needs to include flexibility to accommodate allocations made in a TMDL or other regulatory process and also for non-conservative pollutants (such as temperature). Suggest language that provides

Mixing zones can ~~shall not~~ be authorized for a given pollutant when the receiving water does not meet water quality criteria for that pollutant if the authorized discharge meets the TMDL allocation or other applicable requirements.

Beneficial Uses

The existing Mixing Zone Policy requires that biological, chemical and physical aspects of the receiving water and the discharge will be evaluated to determine the applicability of a mixing zone (see IDAPA 58.01.02.060.01). In the proposal, under 060.01.d, seven specific requirements are given to address the "unreasonable interference with or danger to, existing beneficial uses." As explained by DEQ at the May 1 rulemaking meeting, these requirements are meant to address the "biological, chemical and physical aspects of the receiving water and the discharge." A review of the proposed language for 060.01.d.i through vii. raises two broad questions that need to be addressed:

(1) What is the "threshold" for determining if the criteria are being met? The seven requirements are subject to considerable interpretation and thus showing that these criteria can be met may be very problematic.

(2) Is it the Departments' intent that for a mixing zone to be granted an extensive study (or studies) be carried out to examine the biological, chemical and physical aspects of the discharge going into the receiving water? With the exception of 01.d.vii., the other six requirements are very similar to or the same as the type of analysis found in a Biological Analysis (BA) done for an Endangered Species Act section seven consultation.

Examples of the problematic nature of the requirements include the following:

- How is interference with fish passage, spawning, egg incubation or rearing determined? What are the criteria for determining "what is interference?" For example, EPA proposed and finalized temperature guidance for state and tribal temperature water quality standards.[1] The guidance includes interim species-life stage criteria and related recommendations; for example EPA recommends 21°C as a threshold temperature for which blockage of salmonid passage may occur. EPA's guidance does provide that if upstream temperatures exceed 21°C, then the mixing zone does not result in a temperature change of more than 0.25°C. Is this the type of criteria that DEQ would be relying on for making such determinations?

  Or, would DEQ use its existing water quality standards such as IDAPA 58.01.02 070.07 (application of standards) and 401.01 (point source wastewater treatment requirements for temperature) to determine interference?

  To get a mixing zone does the applicant have to survey the potential mixing zone area and look for: redds, eggs, or evidence that "rearing" is occurring or is this based on the designated beneficial use? If a "redd" is found, does that mean that a mixing zone cannot be located where a "redd" is located? Since redds can vary in location year to year, how will such variability be accounted for? If eggs are present, does the applicant have to examine whether the concentration of the contaminant in the mixing zone would affect such eggs (toxicity or otherwise).

- For endangered species, what is considered from a water quality perspective "destruction or adverse modification to critical habitat?" Is the expectation that dischargers perform an ESA biological assessment for pollutants in the discharge to determine "adverse modification to critical habitat? Such an analysis is an extensive study.[2]

[1] EPA. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards.

[2] Prouty, N. Klootwyk et al. 2001. Approach to Managing the ESA Process as Part of a NPDES Permit Renewal. TAPPI Environmental Conference Proceedings.

Simplot does not believe that a mixing zone analysis should be the basis for a Section 7 "like" consultation. Once Idaho receives NPDES primacy, there is no requirement for an ESA consultation. Idaho water quality standards are reviewed periodically by EPA and through that review and approval process, the standards themselves undergo a consultation process with the Services (NOAA Fisheries and U.S. Fish and Wildlife Service). That consultation, done during the EPA review of Idaho's standards, should be sufficient for ESA species as to the adequacy of the standards. If a discharge has to go through an ESA section 7 consultation (such as is currently required because EPA issues NPDES permits in Idaho), the mixing zone analysis needs to include the results of such a consultation.

- What are the criteria for determining "thermal shock" or loss of cold water refugia? As mentioned earlier, will DEQ be using the referenced EPA guidance document or referring to existing requirements in its rules. Currently, Idaho rules have a number of provisions related to temperature such as:

    - 070.7. Application of Standards: temperature criteria
    - 080.03. Violation of Water Quality Standards: temperature exemption
    - 250.02.b. Surface Water Quality Criteria for Aquatic Life Use Designations: temperature
    - 250.02.g. Surface Water Quality Criteria for Aquatic Life Use Designations: bull trout temperature criteria
    - 401.01. Point Source Wastewater Treatment Requirements: temperature

    Because of the arid characteristic of much of southern and central Idaho, natural conditions often result in elevated water temperatures. Thus, how thermal aspects of discharges are regulated in the Mixing Zone Policy is significant to many dischargers. A review of temperature data for Idaho waters shows that the mainstem Snake River and key tributaries have been "warm" for decades (see Attachment A).[3] Such temperatures and historical fish information suggest that key species of concern (salmonids) have generally adapted to and acclimated to such temperatures. Even in headwater streams, warm temperature conditions exist naturally for salmonids.[4] DEQ's rules have provisions to accommodate such conditions. Understanding how those rules will interface with the Mixing Zone Policy is important.

- Further discussion is needed as to what is meant by "the Department shall consider the bioaccumulative nature of the pollutants involved." It is not clear what the basis is for the Department to make this determination. There are several considerations needed in regards to bioaccumulative contaminants in a discharge. Increasingly, water quality criteria are based on fish tissue concentrations (examples being methylmercury and the recently EPA proposed

[3] Attachment A is an excerpt from Simplot. 2002. Comments on Draft EPA Temperature Criteria.
[4] Zoellick. 1999. Stream Temperatures and the Elevational Distribution of Redband Trout in Southwestern Idaho. Great Basin Naturalist. 59(2) p.136-143.

criterion for selenium). Also, when chronic criteria for toxics are determined, a bioaccumulation or bioconcentration factor is included in the calculation. Finally, the concept of a mixing zone is where there is a potential of an exceedance of water quality criteria, thus within that "zone" there is the potential for effects on individual organisms. Thus, these factors need to be considered in regards to evaluating bioaccumulative pollutants within a discharge.

- How will acute toxicity to aquatic life outside of the zone of initial dilution be determined? Does this mean that the acute criteria (CMC) found in IDAPA 58.01.02.210.01 have to be met at the edge of the initial dilution zone? The existing Mixing Zone Policy has a requirement that the concentration of hazardous materials within the mixing zone not exceed the ninety six (96) hour LC50 for biota significant to the receiving water's aquatic community. What Is the reason for changing from this existing requirement?

- What is a public swimming area? Is this a designated beach or stretch of water where swimming, water boating, water skiing, etc. commonly occur? Or is it those waters that are designated for recreation use?

Discussion of these questions will be helpful in working with the Department on changes to the Mixing Zone Policy.

We appreciate the opportunity to comment on the proposed changes.

Sincerely,

Alan L. Prouty
Vice President, Sustainability and Regulatory Affairs

Attachment

Attachment

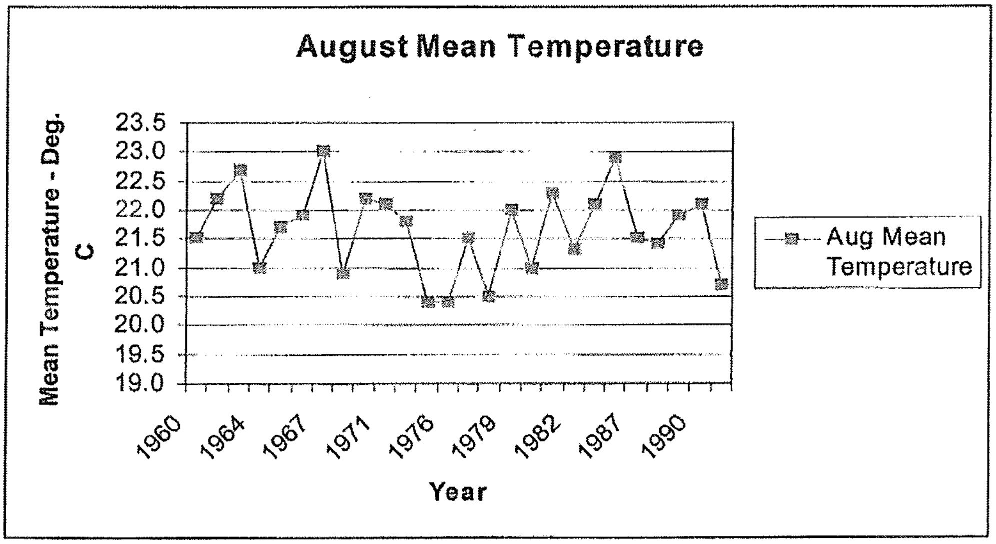
Table 1
Snake River Temperatures at Anatone, WA

Year	Mean Temp June Deg C	July Deg C	Aug Deg C	Sep Deg C	No. of Days Mean Temp > 19.0 C
1960	16.4	22.5	21.5	19.3	77
1961	17.5	22.8	DM	19.5	95
1962	15.4	20.6	22.2	19.4	75
1963	16.0	20.6	22.7	21.0	89
1964	14.3	19.9	21.0	18.1	56
1965	13.8	19.7	21.7	17.4	58
1966	DM	22.3	21.9	20.0	DM
1967	14.0	20.7	23.0	21.8	83
1968	16.1	21.4	20.9	DM	65
1969	DM	DM	DM	DM	DM
1970	14.7	20.6	22.2	17.7	65
1971	13.4	18.9	22.1	18.2	60
1972	14.2	20.4	DM	18.9	69
1973	16.5	20.8	21.8	18.7	66
1974	12.5	17.4	20.4	18.8	47
1975	DM	DM	DM	DM	DM
1976	13.7	19.4	20.4	19.3	64
1977	17.9	20.3	21.5	18.1	76
1978	14.1	18.7	20.5	18.0	46
1979	15.4	21.0	22.0	20.3	85
1980	15.0	20.1	21.0	19.1	70
1981	14.8	20.4	22.3	19.7	75
1982	13.3	17.9	21.3	18.9	52
1983	14.9	18.3	22.1	18.7	58
1984	DM	DM	DM	DM	DM
1985	DM	DM	DM	DM	DM
1986	17.8	21.0	22.9	DM	86
1987	18.2	20.7	21.5	20.4	97
1988	17.2	20.9	21.4	19.0	83
1989	16.3	21.8	21.9	19.7	84
1990	16.0	21.6	22.1	21.0	95
1991	DM	DM	DM	DM	DM
1992	DM	DM	DM	DM	DM
1993	14.9	18.2	20.7	18.6	45

DM = data missing

This data clearly shows that temperatures in the Snake River upstream of Lewiston have been typically greater than 19.0 °C during the summer during the entire history of this station (see Table1). An examination of the data shows that August mean temperatures range from 20.4 to 23.0 °C (Figure 4) with no apparent trend. The duration of temperatures greater than this value range from 45 to 97 days. Clearly, the Snake River in this section of the river is "warm" during the summer and most likely has always been.

Figure 4
August Mean Temperatures – Anatone, WA Station



A more recent study has involved once a week temperature measurements taken at River Mile 144 from mid-July through mid-October.[21,22] Data from 1997 and 1998 show average temperatures in the Snake River at 21.2 °C and 22.0 °C respectively.

Temperature Data - Hells Canyon

Data on temperatures in Hells Canyon as been collected sporadically over the past four decades. The data is primarily from two periods, 1950s through 1973 and 1991 through 1995. The data is from various locations in Hells Canyon. The sources of data include USGS information as organized by McKenzie and Laenen[36] and Idaho Power Company documents. For this review, only several sites will be examined.

The USGS operated a station 3.8 miles downstream of Oxbow Dam (River Mile 269.6). Data from that station (Table 2) shows temperatures not that different from the Anatone Station. Other temperature data includes data gathered by Idaho Power, USGS and Idaho Fish and Game.

[21] Klootwyk, N., "1997 Receiving Water Monitoring Program Report," Potlatch Corporation, June 30, 1998.
[22] Klootwyk, N., "1998 Receiving Water Monitoring Program Report," Potlatch Corporation, June 30, 1999.

Table 2
Snake River Temperatures at Oxbow, OR

Year	Mean Temp June Deg C	July Deg C	Aug Deg C	Sep Deg C	No. of Days Mean Temp > 19.0 C
1959	16.9	19.9	DM	20.4	87
1960	17.0	19.1	21.5	20.1	72
1961	DM	21.0	DM	DM	100
1962	17.5	19.1	21.1	20.4	76
1963	17.7	DM	DM	21.5	100
1964	17.1	19.7	21.2	19.2	71
1965	17.5	19.9	21.9	19.3	72
1966	16.6	18.7	DM	21.1	69
1967	16.5	DM	21.5	22.2	93
1968	16.2	18.6	20.6	18.4	35
1969	17.9	DM	DM	20.2	DM
1970	15.8	19.4	21.2	17.8	65
1971	16.4	19.0	21.9	20.3	68
1972	18.5	19.6	21.1	19.7	84
1973	16.5	DM	DM	DM	DM

DM = data missing

USGS had extensive water temperature monitoring in the mid-Snake River in the 1950s.[23] The U.S. Fish and Wildlife Service. also summarized this data[24,25] Idaho Power has collected temperature data at times during the construction and operation of the multi-dam complex in Hells Canyon.[26,27,28] Idaho Fish and Game also gathered some temperature data during an investigation of fisheries in the Brownlee and Oxbow reservoirs.[29]

[23] Moore, A.M., "Compilation of Water-Temperature Data for Oregon Streams," USGS, November 1964.
[24] U.S. Fish and Wildlife Service, "A Preliminary Progress Report on Air and Water Temperature Studies, Middle Snake River Drainage, 1954-1956," May 1957.
[25] U.S. Fish and Wildlife Service, "A Progress Report on Air and Water Temperature Studies for 1957, Middle Snake River Drainage, April 1958.
[26] Beattie, G. (CH2M HILL) correspondence to A. Prouty (Potlatch Corp), March 2, 2000.
[27] Moore, H.R., Idaho Power Company, March 21, 1961.
[28] Idaho Power Company, "Brownlee-Oxbow Project 1971, Fish Counts and Operational Data 1959-1963."
[29] Webb, W.E., "General Investigations in Water Quality," Idaho Fish & Game Department, June 15, 1962.

Table 3
Snake River Temperatures in Hells Canyon

Location	River Mile	Year	Source	Mean Temperature (Deg C) June	July	August	September
Pittsburg Landing	216.5	1995	IPCO, USFWS		20.6	21.3	20.6
		1994	IPCO, USFWS	16.6	19.9	21.8	20.6
		1993	IPCO, USFWS	16.6	18.6	20.5	19.3
		1992	IPCO, USFWS	15.8	19.1	20.4	19.3
Snake River	239	1995	IPCO		20.4	21.2	20.6
		1994	IPCO	16.4	19.7	21.7	20.7
		1993	IPCO	16.4	18.4		
		1992	IPCO		18.6	20.0	19.3
Hells Canyon Dam	246	1995	IPCO, USFWS			21.1	21.0
		1994	IPCO, USFWS	16.3	20.4	22.0	22.1
		1993	IPCO, USFWS	17.0	18.9	20.7	19.9
		1992	IPCO, USFWS	14.3	18.9	20.4	19.8
Oxbow	270	1954	USGS	17.8	23.9	21.1	17.8
	270	1955	USGS	18.9	22.2	22.8	18.9
	270	1956	USGS	17.8	24.4	22.2	19.4
	270	1957	USGS	18.9	22.2	21.7	18.3
	270	1958	USGS	18.3			20.6
	270	1959	USGS	16.7	20.0	21.1	20.6
	273	1959	IPCO			20.7	19.3
	273	1959	IPCO	16.3	19.0	20.8	19.4
	270	1960	USGS	16.7	18.9	21.7	20.0
	273	1960	IPCO			20.8	20.2
	273	1960	IPCO	16.1	18.3	20.7	19.1
	270	1961	USGS	18.9	21.1	22.2	
	Varies	1961	IFG			22.8	
	273	1961	IPCO	17.5	18.5	21.2	20.2
	270	1962	USGS	17.8	18.9	21.1	20.6
	273	1962	IPCO	16.8	20.1	21.6	19.8
	273	1963	IPCO	18.1	20.6	21.6	20.9
Brownlee	285	1957	USGS	17.8	21.7	20.6	17.8
	285	1958	USGS	16.7	19.4	21.7	18.3
	285	1959	USGS	15.0	18.3	20.0	18.9
	285	1959	IPCO			19.6	19.0
	285?	1959	IPCO	20.7	23.6	23.6	18.8
	285	1960	IPCO			21.3	19.6
	285?	1960	IPCO	20.7	25.0	24.7	20.8
	Varies	1961	IFG	23.3	25.5	25.2	18.5
	285?	1961	IPCO	22.0			
	285?	1962	IPCO	19.1	23.8	23.4	24.8
	285?	1963	IPCO	20.4	22.9	25.0	23.3

As with the temperature data from the Lewiston area, the temperature of the Snake River through Hells Canyon has always been warm during the summer.

Temperature Data – Mid and Upper Snake River

The Corps of Engineers undertook a very comprehensive review of water quality and fisheries in the Snake River basin in the mid-late 1970s.[30] This review looked at water withdrawals from the Snake River, water quality, pollution loadings and fisheries along the Snake River from the mouth to Jackson Lake (Wyoming). Some temperature data was presented in this report and is described below.

Generally, water temperatures in the upper Snake River are below 20 °C. With most of this area being at relatively high elevations (the elevation at the mouth of the Henrys Fork is approximately 4800 feet), cool water temperatures would be expected. Maximum river temperatures measured for a one year period were 16.0 °C at Heise (river mile 854) and 17.6 °C at Alpine (river mile 918).[31] The range of temperatures at Alpine (located at Wyoming/Idaho border) is from 0 to 20 °C, with the peak temperature occurring in late July and early August. Typically temperatures are less than 19 °C.[32]

Further downstream from the mouth of the Henry's Fork, temperatures in the Snake were characterized as being moderate and at desirable levels for a salmonid fishery. Maximum temperatures at Milner Dam (river mile 640) and King Hill (river mile 547) were 21 and 20 °C respectively.[33]

Warming of the Snake River between King Hill and Weiser was reported.[34] Maximum temperature at Swan Falls was given at 24.5 °C and at Weiser 26.5 °C. It was reported that for the preceding five (5) year period, temperatures in this stretch of the Snake River exceeded 21 °C between 9 and 16 weeks a year.

Beattie summarized other data in the mid and upper Snake River .[35] Typically in July temperatures throughout most of the mid Snake are above 18 °C (see Table 4). In August, mean temperatures are usually close to or above 20 °C, with the exception being the upper Snake River. Temperatures near Blackfoot and further upstream are cooler. Temperatures begin showing significant cooling in September, most pronounced highest in the basin. This is not too surprising as ambient air temperatures in the mountains of eastern Idaho drop considerably beginning in September.

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[30] Bennett, D.H., C.M. Falter, and R.G. White, "Environmental Review of the Snake River and Selected Tributaries," in Columbia Basin Water Withdrawal Environmental Review, Appendix-D-Fish, Part II, Snake River, U.S. Army Corps of Engineers, November 1979.
[31] ibid., page 20-22.
[32] ibid., page 279.
[33] ibid., page 55-56.
[34] ibid., page 105.
[35] Beattie, G. (CH2M HILL) correspondence to A. Prouty (Potlatch Corporation), March 2, 2000.

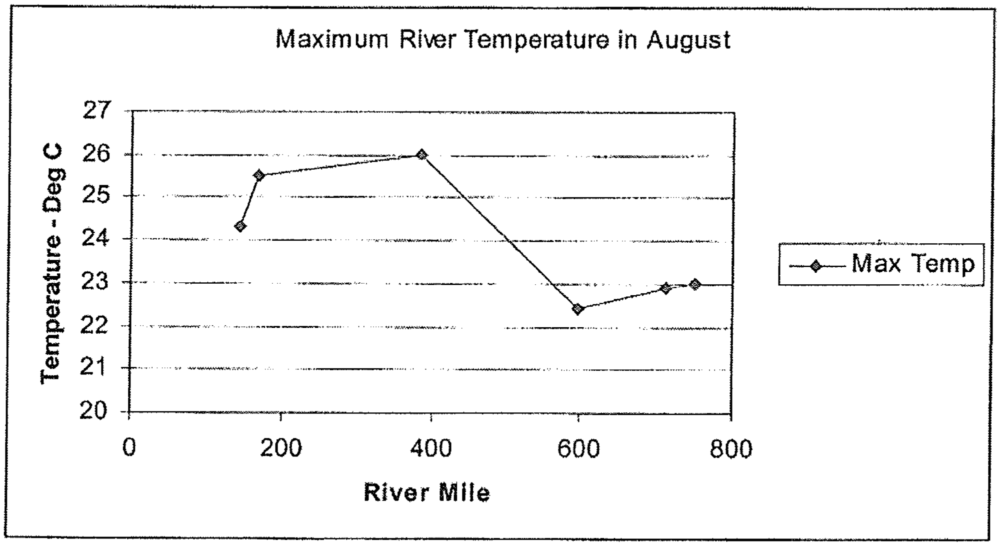
Table 4
Water Temperatures in the Mid and Upper Snake River

Location	River Mile	Year	Source	Mean Temperature (Deg C) June	July	August	September
Nyssa	385	1998	USGS	18.7	23.5	22.9	20.0
		1997	USGS			22.1	19.1
Buhl	597	1998	USGS	16.8	21.3	20.1	18.0
		1997	USGS	18.5	18.9	19.3	18.1
		1996	USGS		20.3	19.0	15.6
Twin Falls	608	1999	IPCO	18.7	19.9	20.5	16.7
		1998	IPCO	17.0	22.3	21.5	19.0
		1997	IPCO	18.9	20.4		
		1996	IPCO	18.1	20.9	19.9	16.1
		1995	IPCO		21.2	20.4	
American Falls	714	1999	IPCO	14.9	18.7	20.7	17.1
		1998	IPCO	14.7	19.8	21.6	19.8
		1997	IPCO	16.7	18.6	20.2	18.8
		1996	IPCO	15.3	18.9	19.7	16.8
		1995	IPCO	13.8	18.1	19.8	18.4
		1994	IPCO	16.5	20.6	21.9	16.7
		1993	IPCO	14.6	17.2	19.2	18.1
		1992	IPCO	17.2	18.6	19.9	14.3
Blackfoot	750	1998	USGS	13.7	18.7	19.4	17.0
		1996	USGS	15.2	19.0	18.1	14.3
		1994	USGS	17.9	18.8	19.4	16.9
Heise	854	1996	USGS			14.8	14.6

Figure 5 shows maximum river temperatures in the mainstem Snake from Blackfoot to Lewiston for August of 1998.[36] The temperature seems to climb as the river passes through southern Idaho and then begins to drop as it heads through Hells Canyon.

[36] Data taken from 1998 Potlatch River Study at Lewiston, 1998 USGS data at Anatone, Nyssa, Buhl and Blackfoot, and 1998 data from Idaho Power at American Falls.

Figure 5
Maximum Snake River Temperatures – August 1998



Tributary & Headwater Temperatures

A review of a limited amount of tributary and headwater temperature data shows that often, the tributaries and their associated headwaters have warm temperatures in the summer. A few selected tributary temperatures are given in Table 5.

The Clearwater River, prior to the completion of Dworshak dam often had temperatures in the summer greater than 20 °C. One of streams in the Clearwater River basin, the Lochsa River, recently underwent a subbasin assessment. The assessment showed that the Lochsa River "regularly exceeds the temperature criteria, but that these temperatures are natural conditions in the subbasin."[37] Temperatures of the Lochsa near the confluence with the Selway River showed mean values of 21.2 and 19.8 °C for July and August. The subbasin data also showed that the Lochsa and its associated tributary streams had a propagating, balanced indigenous population of aquatic life.

[37] Bugosh, Nicholas, "Lochsa River Subbasin Assessment", Idaho Division of Environmental Quality, September 1999, p.55.

Table 5
Selected Tributary Temperatures

Tributary	Location	Year	Source	Mean Temperature (Deg C) June	July	August	September
Payette River	Payette	1998	USGS		23.8	21.6	20.2
	Cascade	1998	USGS		20.1	21.5	19.2
	McCall	1998	USGS	14.2	21.2	22.0	18.9
Weiser River	Weiser	1998	USGS		23.7	22.1	20.2
	Weiser	1997	USGS			22.0	19.0
	Council	1957	USFWS	15.2	20.2	19.0	15.7
Boise River	Twin Springs	1998	USBR	10.6	17.5	19.0	16.6
	SF Boise	1998	USBR	9.7	16.3	17.9	15.7
Portneuf River	Pocatello	1998	USGS	14.8	21.9	20.2	17.0
	Pocatello	1996	USGS	17.1	21.2	19.5	16.5

The Weiser River drainage has shown elevated temperatures for decades. Temperature data collected in 1957 showed maximum temperatures of the Weiser River near the confluence with the Snake River above 26 °C.[38] In fact, at times the minimum temperature recorded in July was 26.9 °C. Daily mean temperatures further upstream on the Weiser River near Council, ID were typically between 18.9 and 21.1 °C. More recent monitoring data shows that some of the headwater streams of the Weiser River still have temperatures similar to those measured in 1957.

The Payette River, like the Weiser River has shown high temperatures during the summer. In fact, even at McCall in 1998, water temperatures in July and August were typically greater than 20 °C.

Data from other drainages, such as the Jarbridge ,Owyhee and Lemhi show very wide ranges of temperatures during the summer. Some of the streams in these subbasins have very moderate summer temperatures (mean temperatures of 14 to 18 °C) while others have maximum temperatures that approach or exceed 25 °C. In fact, in the Owyhee drainage, temperatures up to 29 °C have been documented with native redband trout populations.[39]

[38] "A Progress Report on Air and Water Temperature Studies for 1957, Middle Snake River Drainage," U.S. Fish and Wildlife Service, April 1958.
[39] Zoellick, B.W., "Stream Temperatures and the Elevational Distribution of Redband Trout in Southwestern Idaho," Great Basin Naturalist 59(2), 1999, p.136-143.

Natural Conditions – Summary

Readily available water temperature data, though limited for some locales, exist back to the mid-50s for the mainstem Snake River and for certain tributaries. This data shows a very consistent pattern: the mainstem Snake River and most of its tributaries have historically been "warm" especially in July and August. Mean temperatures often exceed 19 °C for the majority of July and August. Furthermore, these temperatures are prevalent throughout the majority of the length of the Snake River in Idaho for these time periods. And the data also suggest that temperatures today in the mainstem river are similar to what they were over 40 years ago, despite continued development along the Snake River.[40] There are numerous factors that influence the temperature of the Snake River, but solar radiation (represented by ambient air temperature) is likely one of the most significant factors. Also, stream flow (surrogate for amount of snowpack and when snowpack melts-off) influences water temperatures throughout the summer. There can be no doubt that the warm water temperatures measured in the Snake River are due primarily to naturally occurring conditions.

Fish Behavior and Interim Criteria

As mentioned earlier, the proposed interim criteria are very conservative. One example is the criteria for what temperature allegedly causes "migration blockage" (21 °C, 70 °F) and the temperature for adult salmon migration (18 °C, 65 °F).

Examination of adult Chinook passage data through Lower Granite Dam and Ice Harbor Dam from 1990 to 1999 (compiled by Columbia River Basin Research, University of Washington indicate that passage of Chinook through these two dams occurs at temperatures above 21°C. Review of the past 10 years (1990 to1999) of sockeye and steelhead passage data at Lower Granite Dam and Ice Harbor Dam parallels the findings for Chinook. Namely, that fish pass through that dams at temperatures in excess of 21°C. Again, this suggests that 21°C may not be a thermal barrier to migrating salmonids, as suggested by the guidance and by USEPA.[41]

[40] The Snake River, is the main "artery" of life for the majority of Idaho, as a considerable amount of Idaho's population and economic activity occur along or near the river. Thus, activities such a water use for municipal and agriculture purposes do influence water quality, including water temperature. Also, hydropower facilities built on the river do shift the timing of thermal peaks and valleys. However, one would have expected a deterioration in water temperature (i.e., warmer temperatures) over the past several decades as development has increased greatly. The data that is available shows that is not the case. This further supports natural factors as having the greatest influence on water temperatures.

[41] U.S. EPA. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon. EPA 910-R-99-010.

Also, the proposed criteria fail to account for the acclimation of salmonids to naturally occurring "warm" temperatures. Data from many experiments provide evidence that the temperatures tolerated by salmonids (and other species of fish as well) are a function of three factors:

- the acclimation temperature;
- the magnitude of the difference between the acclimation temperature and the elevated temperature; and
- the duration of exposure to the elevated temperature.

The acclimation temperature is the temperature of the water the fish are living in prior to being exposed to the elevated temperature. The elevated temperature that a salmonid can tolerate increases with increasing acclimation temperature. Chinook salmon acclimated to water at 15.6°C have an upper incipient lethal temperature (UILT) of 24.8°C.[42] For juvenile Chinook acclimated to 24°C, the UILT is 25.1°C.[43] Eventually the UILT reaches an upper limit, regardless the acclimation temperature. This is referred to as the ultimate UILT (or UUILT) and is about 25.1°C for juvenile Chinook.[44]

The duration for which a salmonid can tolerate an elevated temperature decreases with increasing temperature. For example, Chinook salmon juveniles acclimated to water at 15°C can tolerate water of 22°C, 23°C, 24°C and 25°C for 62.2 hours, 18.1 hours, 5.3 hours and 1.5 hours, respectively.[45] The combination of acclimation temperature, upper incipient temperature and duration of exposure to elevated temperatures can be shown on an exposure/acclimation graph. Such figures can be used to identify the "tolerance zone".[46]

As mentioned earlier, historical records show that the salmonid species of concern have existed in the "warm" waters found in Idaho for decades. Thus, such species have definitely adapted to and found ways to acclimate to the temperatures that exist in Idaho streams and rivers. The proposed criteria are rigid and don't recognize the ability of fish to adapt/acclimate to such temperatures.

Summary

Thus, the historical temperature record and known fish behavior data show that the interim temperature criteria given in the draft Guidance are unachievable and as such do not represent the true environmental conditions that salmonid species have lived and thrived in historically.

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[42] ibid., page 41.
[43] ibid., page 41.
[44] ibid., page 41.
[45] ibid., page 42.
[46] ibid., page 42.