

Rulemaking Docket 58-0102-1803

De Minimus Heat Additions

Discussion Paper #1

Overview

This rulemaking has been initiated to allow de minimus additions of heat in waters that exceed applicable temperature criteria.

Currently, Idaho's point source treatment requirements limit point sources of heat to raising receiving water temperatures by no more than 0.3°C when the receiving water is naturally warmer than numeric criteria. If the temperature of a stream is above the numeric temperature criteria and the temperature exceedance is not due to, or cannot be tied to, natural conditions, the 0.3°C allowance in the current rule is not applicable.

Heat is a non-conservative pollutant, meaning heat added to a stream does not only accumulate but also dissipates. Furthermore, sources of heat can be relatively small. This rulemaking proposes modifying the rules for NPDES/IPDES regulated human sources of heat loading to allow no more than a *de minimus* 0.3°C increase in receiving water temperatures. This proposal would allow up to a 0.3°C increase to waters that are exceeding the numeric temperature criteria upstream of the discharge for the designated aquatic life use. DEQ proposes to accomplish this by striking the words "due to natural background conditions" from the current allowance for human use in Subsection 401.01.c.

Current Rule

POINT SOURCE WASTEWATER TREATMENT REQUIREMENTS (IDAPA 58.01.02.400)

Unless more stringent limitations are necessary to meet the applicable requirements of Sections 200 through 300, or unless specific exemptions are made pursuant to Subsection 080.02, wastewaters discharged into surface waters of the state must have the following characteristics: (4-11-06)

01. Temperature. *The wastewater must not affect the receiving water outside the mixing zone so that: (7-1-93)*

a. *The temperature of the receiving water or of downstream waters will interfere with designated beneficial uses. (7-1-93)*

b. Daily and seasonal temperature cycles characteristic of the water body are not maintained. (7-1-93)

c. If temperature criteria for the designated aquatic life use are exceeded in the receiving waters upstream of the discharge due to natural background conditions, then wastewater must not raise the receiving water temperatures by more than three tenths (0.3) degrees C.

Discussion

Idaho has many very small point sources (Figure 1). All add some heat to the waters to which they discharge. And, in most cases, the water bodies to which they discharge are warmer than Idaho's numeric temperature criteria set to protect aquatic life for a portion of each year. Additionally, the discharged water may aid in maintaining stream flows for cold water dependent aquatic life. For example the Moscow Wastewater Treatment plant discharge to Paradise creek, an otherwise intermittent stream above US 95, maintains perennial in stream flow and beneficial uses during low-flow periods (Paradise Creek TMDL, 1997).

Due to the natural geography of a given water body, the standard alternatives to point source discharge (i.e. land application) may not be viable options. For example, the Potlatch River experiences very low summer flows, which are supplemented with wastewater discharge. Land application is not a viable option for the cities of Juliaetta, Kendrick, or Troy, Idaho. Small communities, like these three, are not responsible for the background temperature of the water body and meeting an end-of-pipe requirement would require adding cooling ponds, for which there is no available space, or adding prohibitively expensive chillers.

Absent a *de minimus* allowance, increasing the temperature of receiving waters that are warmer than criteria would force most point sources to have to cool their discharge or cease to discharge. Allowing a *de minimus* increase in temperature, irrespective of receiving stream temperature, provides a clear path forward in Total Maximum Daily Loads (TMDLs) and acknowledges current practice.

TMDLs are being developed to reduce heat loads to streams that exceed temperature criteria. For non-point sources, these thermal TMDLs target restoring potential natural vegetation and channel width to reduce the heat load from the sun to levels that are natural. For point sources, the provision in 401.01.c allowing an increase of 0.3°C has been used. However, this allowance is being used as the basis for thermal wasteload allocations irrespective of whether water temperatures exceed criteria due to natural conditions as is specified in current rule. EPA has approved several such TMDLs, such as the Potlatch River TMDL and the Camas Creek Subbasin TMDL.

At EPA's behest, these mixed source temperature TMDLs, i.e. with both point and non-point sources of heat addressed, typically include a table translating the wasteload allocation into effluent temperatures under a range of possible receiving stream and effluent flows for each point source. Including such effluent quality specifications in a TMDL goes beyond the requirements of a TMDL and steps into the realm of permitting. Because the heat load can be quite small, with large dilution ratios, these tables

sometimes include calculable, but wholly unrealistic (or even impossible), temperatures (e.g. above the boiling point of water).

The reasons for including a table of allowed effluent temperatures in the TMDL, rather than leaving this to later permit development, as is practiced for all other pollutants, are not entirely clear. It would seem to be related to the uniqueness of temperature and concern over how a heat load would be converted to an effluent temperature. As demonstrated in Table 1, a fixed increase in temperature represents the same gain in heat regardless of the starting temperature.

The draft proposed rule would authorize DEQ to continue to calculate waste load allocations and effluent limits in TMDLs that provide for insignificant increases in receiving water temperatures without causing any measurable effect on existing aquatic life.

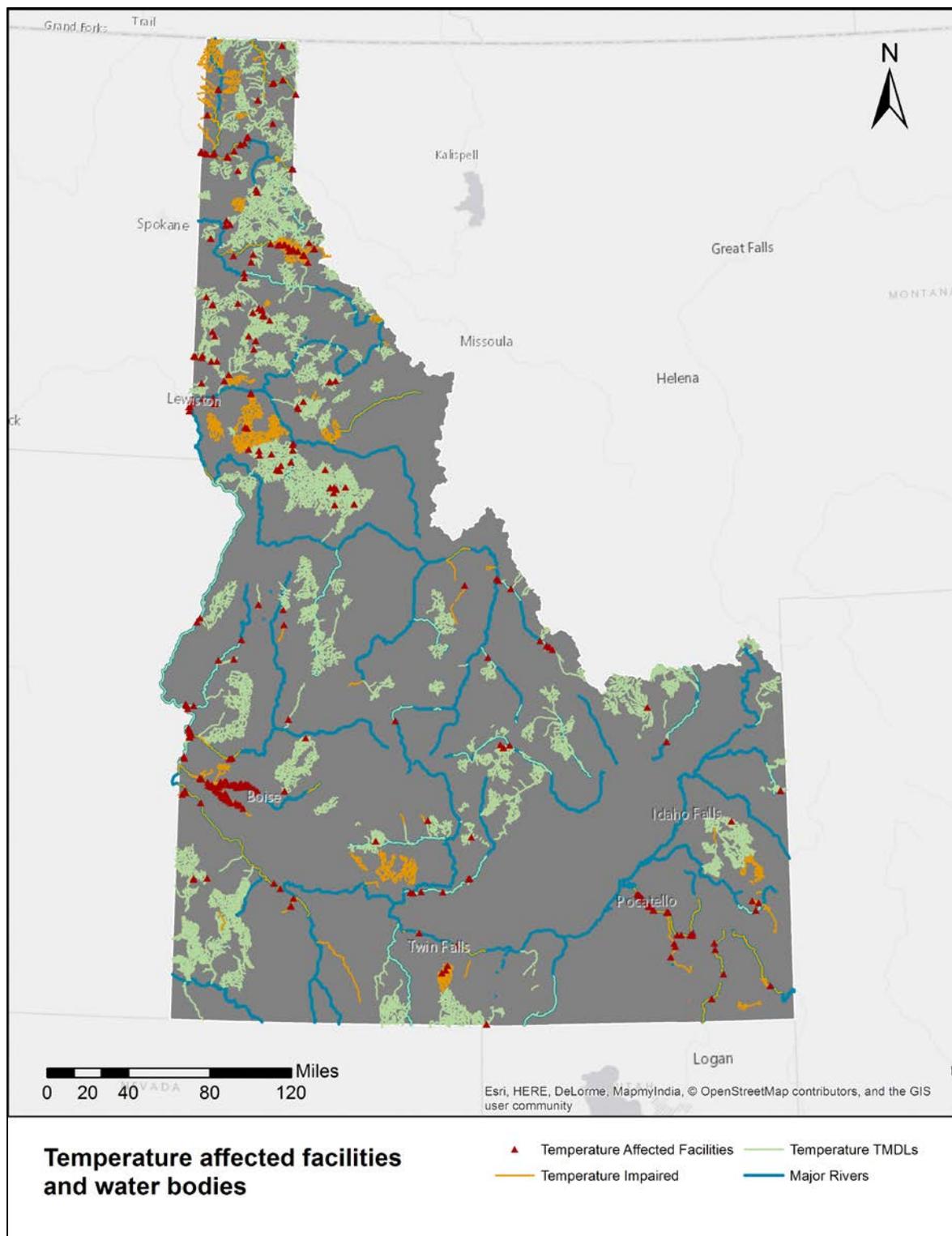


Figure 1. The locations of permitted facilities and water bodies affected by temperature.

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Thermal wasteload calculation					
BTU = Den. Water (62.4 lb/ft ³) x allowed increase (0.54°F) ÷ +1°F / lb = 33.7 BTU/ft ³					
33.7 BTU/ft ³ x ft ³ /sec = 33.7 BTU/sec					
Receiving Stream	In stream	In stream	Allowed Heat load	In stream	Discharge
Current temp.	Allowed increase	Allowed temp	BTU/ ft ³	cfs	BTU/sec
13	0.3	13.3	33.7	1	33.7
14	0.3	14.3	33.7	2	67.4
15	0.3	15.3	33.7	3	101.1
16	0.3	16.3	33.7	4	134.8
17	0.3	17.3	33.7	5	168.5
18	0.3	18.3	33.7	6	202.2
19	0.3	19.3	33.7	7	235.9
20	0.3	20.3	33.7	8	269.6
21	0.3	21.3	33.7	9	303.3
22	0.3	22.3	33.7	10	337
23	0.3	23.3	33.7	11	370.7
24	0.3	24.3	33.7	12	404.4
25	0.3	25.3	33.7	13	438
26	0.3	26.3	33.7	14	471.7

Table 1. Increasing the temperature of a waterbody by 0.3 °C requires the same thermal input, regardless of the starting temperature.