



# FISH PASSAGE CENTER

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## MEMORANDUM

TO: Dave Swank, USFWS

FROM: Margaret Filardo

Brandon Chockley

DATE: April 1, 2016

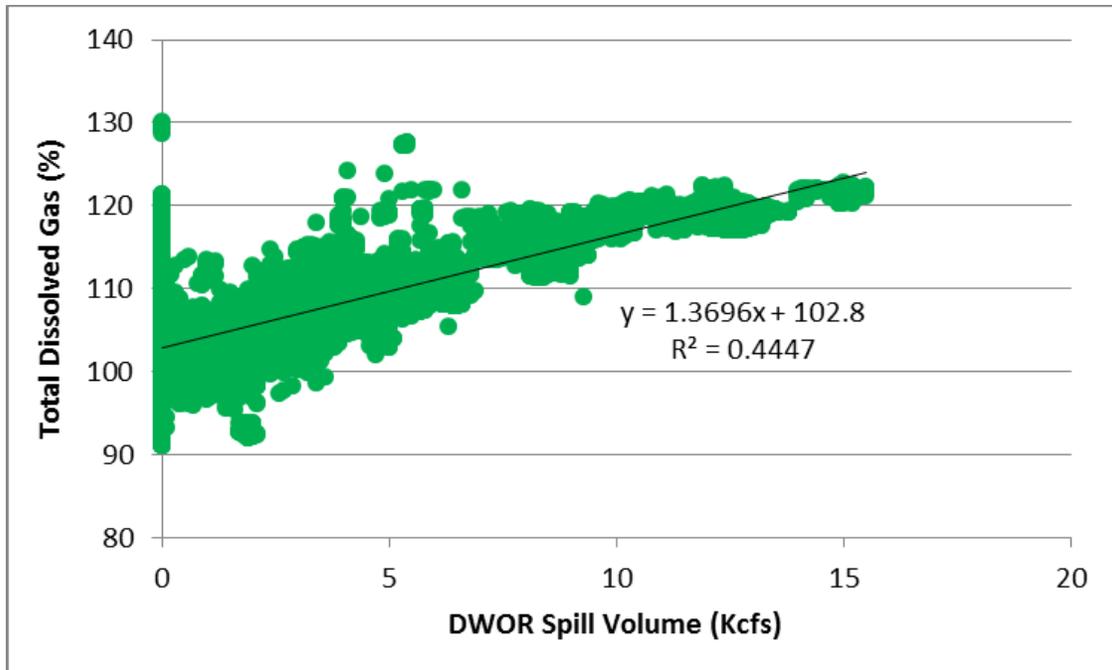
SUBJECT: TDG below Dworshak Dam

We have developed the following in response to your request for information regarding total dissolved gas (TDG) below Dworshak Dam. Your request was relative to the possibility that the COE may increase flow at Dworshak Dam up to 25 Kcfs to meet their newly calculated end of April flood control elevation.

Flow levels of 25 Kcfs flow, with spill of 15 Kcfs, did occur during a flood control operation in 1997 and for short periods of time in 2011. During those two periods the TDG exceeded 120% by a few percentage points.

We also considered the data available relative to the spill and TDG relation for Dworshak at all spill levels. (At this time of year a level of 4 Kcfs spill at Dworshak is considered possible without exceeding the 110% Idaho State and Nez Perce Tribal water quality standards.) Of all available data (approximately 122,300 hourly estimates), about 9% of the values in our 21-year database of hourly estimates are for spill levels of 4 Kcfs or greater than.

We used the hourly data for spill levels and plotted it against the corresponding hourly TDG level to obtain the following relation (Figure 1).



**Figure 1. Hourly spill (1995 to 2015) at Dworshak Dam versus the hourly tailrace TDG estimate.**

From the graph it is apparent that there is considerable variation in the TDG produced from various spill levels. This analysis compiled all data across the season and includes other factors besides spill level, such as primary productivity, temperature and wind speed, and measurement error, which all can affect the TDG level.