
From: Irle, Pat (ECY) [mailto:PIRL461@ECY.WA.GOV]
Sent: Tuesday, November 25, 2008 4:41 PM
To: Shane Bickford
Subject: RE: Phase_II_test_scenarios_(11-4-08)(1).xls

Thanks!

From: Shane Bickford [mailto:ShaneB@dcpud.org]
Sent: Tuesday, November 25, 2008 1:29 PM
To: Irle, Pat (ECY)
Cc: Josh Murauskas; Bob Clubb, Ph.D.; Mary Mayo
Subject: FW: Phase_II_test_scenarios_(11-4-08)(1).xls

Pat,

Please find below Marcela Politano's (Head TDG modeler at Iowa) definition for "Gas Volume Fraction" as described in the Total Dissolved Gas Report. If you have any further questions regarding the TDG report, please feel free to give Josh or I a call.

Regards,

Shane Bickford
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From: Marcela Politano [mailto:mpolitan@engineering.uiowa.edu]
Sent: Tuesday, November 25, 2008 12:45 PM
To: Shane Bickford
Cc: Bao Le; 'Duncan Hay'; Josh Murauskas
Subject: RE: Phase_II_test_scenarios_(11-4-08)(1).xls

Hi Shane,

The gas volume fraction (known as void fraction in nuclear engineering) is the volume fraction of air in an air-water mixture. In mathematical words:

Gas volume fraction: $\text{volume of air} / (\text{volume of air} + \text{volume of liquid})$.

The gas volume fraction has different interpretation in the VOF and mixture models:

The VOF model is used to calculate the free surface location (air is above the water). Gas volume fraction 0 represents the air and 1 the water.

In the mixture model (used to calculate the TDG) the air is in bubbles within the water. The gas volume fraction represents the volume fraction of bubbles in a control volume of mixture.

Hope that helps,

Marcela