

Attachment H - Anti-Deg Mass Balance Calculation SGI Northern Tract Quarry - SS - CHN1-US

Date Sampled	Sur. Elev	Flow GPM	Field pH	Lab PH	Spec Cond	Temp °C	Aik mg/l	Acid mg/l	Iron mg/l	Mang mg/l	Alum mg/l	Sulf mg/l	T1 Susp Solid	T1 Dis Solid
3/17/2015													5	
5/13/2015													7	
8/27/2015													5	
10/29/2015													5	
2/24/2016													16	
5/25/2016													5	
#####		195.73											13	
8/18/2016		138.75											19	
9/27/2016		90.68											5	
10/26/2016		117.85											5	
12/7/2016		328.61											5	
12/29/2016		216.85											5	

Average Flow 181.4117

	Iron	Manganese	Aluminum		Total Suspended Solids
Averages	#DIV/0!	#DIV/0!	#DIV/0!		7.916666667
Alpha (95%)	0.05	0.05	0.05		0.05
Std Dev	#DIV/0!	#DIV/0!	#DIV/0!		4.855552377
Size	127	127	7		7
Confidence	#DIV/0!	#DIV/0!	#DIV/0!		3.596977443
Mean	#DIV/0!	#DIV/0!	#DIV/0!		7.916666667
Upper Bound	#DIV/0!	#DIV/0!	#DIV/0!		11.51364411

Sample Date	Flow GPM	pH/Field	Lab pH S.U.	Spec. Cond. pmhos/cm	Temp. °C	Alkalinity mg/L	Acidity mg/L	Iron mg/L	Mn mg/L	Al mg/L	Sulphate mg/L	TSS mg/L
	10											
Average Flow	10					Averages		Iron #REF!	Manganese #REF!	Aluminum #REF!		

**Strict Anti-Deg Method**

<b>TSS</b>		
$(Q_{\text{discharge}} \times C_{\text{discharge}}) + (Q_{\text{upstream}} \times C_{\text{upstream}}) = (Q_{\text{total}} \times C_{\text{total}})$		
$Q_{\text{discharge}}$	10 GPM	Average discharge flow (from cell B6 in sheet discharge)
$C_{\text{discharge}}$	mg/L	Discharge concentration (factor being solved for)
$Q_{\text{upstream}}$	94.3 GPM	Upstream flow (harmonic mean flow from StreamStats)
$C_{\text{upstream}}$	7.9 mg/L	Upstream concentration (mean TSS concentration, from cell N16 in sheet US)
$Q_{\text{total}}$	104 GPM	Combined downstream flow ( $Q_{\text{discharge}} + Q_{\text{upstream}}$ )
$C_{\text{total}}$	11.5 mg/L	Target concentration (upper bound of 95% confidence interval for TSS concentration, from cell
Calculation Result (LTA):	45.43	
Resulting Monthly Average:	78.14	
Resulting Daily Maximum:	156.28	
Reesulting Instantaneous Maximum:		195.35