Using the implementation criteria in OAC 785:46, Subchapter 9, instream concs of Cl, SO_4 and TDS are calculated for comparison against the higher of the default floor LTAs and both YMS and SS criteria. If an instream conc exceeds the higher of the default/YMS or default/SS criteria, WLA's and LTA's are calculated and the limiting LTA is determined. Minimum LTA's used for permit development are 250 mg/l for Cl and SO_4 and 700 mg/l for TDS. No determination of RP for monitoring purposes is made (i.e., N/A) if RP is demonstrated for limit purposes. **Note: Number of samples per month (N) MUST BE SPECIFIED before permit limits can be calculated.**

OWQScreen-S Version 3.35

Agriculture

GLENPOOL PIPELINE BREAKOUTSTATION

Outfall	Calculation of Mineral Concentrations After Mixing (for Effluent Limits)											
				Comparison with Yearly Mean Std (YMS)				Comparison with Sample Std (SS)				
Parameter	Units	C_b	Default Criteria Floor	YMS Criterion	Eqn 48 Instream Conc C_d	C_d > Crit? *	Eqn 49 YMS WLA	SS Criterion	Eqn 48 Instream Conc C_d	C_d > Crit? **	Eqn 49 SS WLA	RP FLAG ◄
Chlorides	mg/l	513	250	719	508.4	NO		925	491.5	NO		
Sulfates	mg/l	116	250	147	116.6	NO		178	118.8	NO		
TDS	mg/l	1124	700	1496	1119.0	NO		1868	1100.4	NO		

* In determining whether C_d > criterion, the criterion is the higher of the YMS criterion or the default floor.

** In determining whether C_d > criterion, the criterion is the higher of the SS criterion or the default floor.

Outfall	Determination of Limiting LTAs and Agriculture-Based Permit Limits										
					Limiting LTA		Conc Limits (mg/l)			Loading Limits (lb/day)	
Parameter	Units	Eqn 50 YMS LTA	Eqn 50 SS LTA	Default LTA Criteria Floor	Criteria	Eqn 51 Value	Eqn 52 Monthly Average	Eqn 53 Daily Maximum	No. of Samples per Month (N)	Eqns 44,46 Monthly Average	Eqns 45,47 Daily Maximum
Chlorides	mg/l										
Sulfates	mg/l										
TDS	mg/l										

Outfall	Calculation of Mineral Concentrations After Mixing (for Effluent Monitoring)										
				Comparison with YMS			Comparison with SS				
Parameter	Units	C_b	Default Criteria Floor	YMS	Eqn 48 Instream Conc C_d	C_d > Crit? *	SS	Eqn 48 Instream Conc C_d	C_d > Crit? **	RP FLAG ◄	Monitoring Reqd?
Chlorides	mg/l	513	250	719	508.5	NO	925	492.2	NO		NO
Sulfates	mg/l	116	250	147	117.7	NO	178	124.0	NO		NO
TDS	mg/l	1124	700	1496	1122.2	NO	1868	1115.3	NO		NO

* In determining whether C_d > criterion, the criterion is the higher of the YMS criterion or the default floor.

** In determining whether C_d > criterion, the criterion is the higher of the SS criterion or the default floor.

Equations Used to Calculate Concentrations after Mixing, WLAs and LTAs			
		YMS Screen	SS Screen
Eqn 48	Instream Conc C_d =	((C95 x Q*****) + C_b) / (1+Q*****)	((C95 x Q****) + C_b) / (1+Q****)
Eqn 49	WLA (if C_d > Criteria) =	YMS + (YMS - C_b) / Q*****	SS + (SS - C_b) / Q****
Eqn 50	Criterion LTA =	WLA_{YMS}	WLA_{SS} x EXP (0.5 LN(1 + CV^2 / 4) - 2.326 (LN(1 + CV^2 / 4))$^{1/2}$)
Eqn 51	Limiting Criterion LTA =	MIN (LTA_{YMS}, LTA_{SS})	

Equations Used to Calculate Agriculture-Based Conc Limits		
Eqn 52	Monthly Avg (Cl, SO_4) =	MAX (250, Limiting LTA) x EXP(1.645 (LN(1 + CV^2 / N))$^{1/2}$ - 0.5 LN(1 + CV^2 / N))
	Monthly Avg (TDS) =	MAX (700, Limiting LTA) x EXP(1.645 (LN(1 + CV^2 / N))$^{1/2}$ - 0.5 LN(1 + CV^2 / N))
Eqn 53	Daily Max (Cl, SO_4) =	MAX (250, Limiting LTA) x EXP(1.645 (LN(1 + CV^2))$^{1/2}$ - 0.5 LN(1 + CV^2))
	Daily Max (TDS) =	MAX (700, Limiting LTA) x EXP(1.645 (LN(1 + CV^2))$^{1/2}$ - 0.5 LN(1 + CV^2))

Eqn No.	Type Limit	Equation for Calculating WQ-Based Loading Limits for Municipalities
Eqn 44	MAL	MAL_{LDG} = $Qe_{(D)}$ (in mgd) x MAL_{CONC} (in mg/l) x 8.34
Eqn 45	DML	DML_{LDG} = $Qe_{(D)}$ (in mgd) x DML_{CONC} (in mg/l) x 8.34

Eqn No.	Type Limit	Equation for Calculating WQ-Based Loading Limits for Industries
Eqn 46	MAL	MAL_{LDG} = $Qe_{(30)}$ (in mgd) x MAL_{CONC} (in mg/l) x 8.34
Eqn 47	DML	DML_{LDG} = $Qe_{(30)}$ (in mgd) x DML_{CONC} (in mg/l) x 8.34

Q* Flow Ratios		Q***** (YMS)	Q**** (SS)
Type Facility	INDUS	0.00947	0.04595