APPENDIX F

HSPF SEDIMENT PARAMETERS

Appendix F. Sediment Parameters for HSPF Model

Group	Parameter	Units	BB values[c]	WOB Values	Range of Values: Typical[a]		Recommended[a]		Permitted[b]		Comments
			current		min	max	min	max	min	max	
SED-PARM1	CRVFG	none	0	1					0	1	Erosion related cover is not variable by month
	VSIVFG	none	0	0					0	2	The net vertical sediment input does not vary by month
	SDOPFG	none	1	1					0	1	Sediment removal is simulated ARMS and NPS variable
SED-PARM2	SMPF	none	1	1	0	1	0	1	0.001	1	No reduction in erosion has been achieved through erosion control
	KRER	complex	0.07064-0.3641	0.32	0.15	0.45	0.05	0.75	0	none	Coefficient in the soil detachment equation; depends on soil type
	JRER	complex	1.7-2.0	2	1.5	2.5	1	3	none	none	Start with value of 2.0 then calibrate
	AFFIX	/day	0.1-0.4	0.01	0.03	0.1	0.01	0.5	0	1	Reduction of fine sediments by tillage
	COVER	none	0.5	0.5-0.93	0	0.9	0	0.98	0	1	Vegetal cover land use
	NVSI	lb/ac-day	0	1-2	0	5	0	20	none	none	Atmospheric additions to sed storage
SED-PARM3	KSER	complex	0.1-3.5	0.1-0.3	0.5	5	0.1	10	0	none	Obtained by calibration and prior experience
	JSER	complex	2.0-3.0	1.0-2.7	1.5	2.5	1	3	none	none	Start with value of 2.0 then calibrate
	KGER	complex	0-0.15	0	0	0.5	0	10	0	none	Only used when gullies present
	JGER	complex	2	1.0-2.9	1	3	1	5	none	none	Start with value of 2.5 then calibrate
SED-STOR	DETS	tons/ac	0	0					0	none	Initial storage of sediment
SLD-PARM2	KEIM	complex	0.1-0.1	0.1-1.3	0.5	5	0.1	10	0	none	Coeff. For wash off of accumulated sediments
	JEIM	complex	1.5-3.0	1.0-2.5	1	2	1	3	none	none	Start with value of 1.5
	ACCSDP	tons/ac/day	0.01-1	3.14E-5-0.05	0	2	0	30	0	none	Primarily calculated through calibration
	REMSDP	/day	0.009-0.1	0.05-0.75	0.03	0.2	0.01	1	0	1	Start with ~ 1.5 then calibrate
SLD-STOR	SLDS	tons/ac	0	0					0	1	Primarily calculated through calibration
HYDR-PARM1	AUX3FG	none	1	1					0	1	1 Dictates that the shear velocity and bed stress will be calculated
HYDR-PARM2	DB50	in	0.006088-0.7739	0.0154	0.01		0.0001	100	0.0001	100	Median diameter of the bed sediment
SANDFG	SANDFG	none							1	3	Specifies sandload simulation (1 = Toffaleti method)
SED-GENPARM	BEDWID	ft	5-100	30			1	none	1	none	Width of the cross section over which sed is deposited
	BEDWRN	ft	200	6			0.001	none	0.001	none	Bed depth greater than which warning message will be given
	POR	none	0.15	0.5	0.5		0.1	0.9	0.1	0.9	Can be determined from STATSGO data
SAND-PM	D	in	0.01671	0.0049			0.001	100	0.001	100	Recommended range is that provided by AASHTO
	W	in/s	5.2787	0.02			0.5	12500	0.02	500	Possible Range calculated using Stoke's Eqn and modified using approach of Baba & Koma (1981)
	RHO	gm/cm^3	2.65	2.575	2.65		1	4	1	4	2.65 - recommended by HSPF
	KSAND	complex	0.05-2.5	0.1			0	none	0	none	Suggested range of 0.05 to 0.5
	EXPSND	complex	2.5	2			0	none	0	none	Suggested range of 0.05 to 0.5
SILT-CLAY-PM	D	in	0.00244	0.005			0	0.003	0	0.003	Recommended range is that provided by AASHTO
	W	in/s	0.1353	0.0001			0	0.2	0	0.07	Possible Range calculated using Stoke's Eqn
	RHO	gm/cm^3	2.65	2.7	2.65		2	4	2	4	2.65 - recommended by HSPF
	TAUCD	lb/ft^2	0.0400-0.12	0.0001-0.29	1.00E+10		1.00E-10	none	1.E-10	none	
	TAUCS	lb/ft^2	0.06-1.55	0.0001-0.3	1.00E+10		1.00E-10	none	1.E-10	none	
	M	lb/ft^2 d	0.001-0.35	2.7-4.7			0	none	0	none	Recommended value of 0.05 (Donigian and Love, 2003)
SILT-**CLAY**-PM	D	in	0.0000985	0.0001			0	0.003	0	0.003	Recommended range is that provided by AASHTO
	W	in/s	2.21E-04	0.00001			0	0.2	0	0.07	Possible Range calculated using Stoke's Eqn
	RHO	gm/cm^3	2.65	2	2.65		2	4	2	4	2.65 - recommended by HSPF
	TAUCD	lb/ft^2	0.00005-0.11	0.01-0.12	1.00E+10		1.00E-10	none	1.E-10	none	
	TAUCS	lb/ft^2	0.0006-0.225	0.03-0.41	1.00E+10		1.00E-10	none	1.E-10	none	
	M	lb/ft^2 d	0.001-0.25	0.01			0	none	0	none	Recommended value of 0.05 (Donigian and Love, 2003)

a Reported by Donigian and Love (2003) or values calculated based upon watershed sediment properties (noted in comments)
b Permissible limits reported by HSPF User's Manual (1996)
c Subbasins 991 and 992 were not included in the assessment; these subbasins are used only for reservoir modeling

Appendix F. Sediment Parameters for HSPF Model - Subbasin 26

			Range of Values				
Group	Parameter	UCI code values	Typical		Possible		Calculated Values
		current SB26	min	max	min	max	
SED-PARM1	CRVFG	0					**0**
	VSIVFG	0					**0**
	SDOPFG	1					**1**
SED-PARM2	SMPF	1	0	1	0	1	No reduction in erosion has been achieved through erosion control
	KRER	0.32	0.15	0.45	0.05	0.75	From USGS Data - **0.32**
	JRER	1.7	1.5	2.5	1	3	Start with value of 2.0 then calibrate
	AFFIX	0.1	0.03	0.1	0.01	0.5	Reduction of fine sediments by tillage - calibrated
	COVER	0	0	0.9	0	0.98	Vegetal cover land use
	NVSI	0	0	5	0	20	Atmospheic additions to sed storage
SED-PARM3	KSER	0.05	0.5	5	0.1	10	Obtained by calibration and prior experience
	JSER	0	1.5	2.5	1	3	Value of abou **2.0** recommended
	KGER	0.05	0	0.5	0	10	Only used when gullies present
	JGER	0	1	3	1	5	Start with value of **2.5** then calibrate
SED-STOR	DETS	0					Initial storage of sediment
SLD-PARM2	KEIM	0.1	0.5	5	0.1	10	Coeff. For wash off of accumulated sediments
	JEIM	5	1	2	1	3	Start with value of **1.5**
	ACCSDP	0.05	0	2	0	30	Primarily calculated through calibration
	REMSDP	0	0.03	0.2	0.01	1	Start with ~ 1.5 then calibrate
SLD-STOR	SLDS	0					Primarily calculated through calibration
HYDR-PARM1	AUX3FG	1					1 Dictates that the shear velocity and bed stress will be calculated
HYDR-PARM2	DB50	0.002871	0.01		0.0001	100	STATSGO - **0.009713**
SED-GENPARM	BEDWID	40			1	none	Width of the cross section over which sed is deposited
	BEDWRN	200			0.001	none	Bed depth greater than which warning message will be given
	POR	0.5	0.5		0.1	0.9	STATSGO - **0.15**
SAND-PM	D	0.0049			0.001	100	STATSGO - **0.0199**
	W	0.5244			0.5	12500	STATSGO - **7.274**
	RHO	2.575	2.65		1	4	**2.65** - recommended by HSPF
	KSAND	5			0	none	Suggested range of **0.05** to **0.5**
	EXPSND	5.3			0	none	Suggested range of **0.05** to **0.5**
SILT-CLAY-PM	D	0.00047			0	0.003	avg AASHTO - **0.00244**
	W	0.0001423			0	0.2	STATSGO - **0.1353**
	RHO	2.7	2.65		2	4	**2.65** - recommended by HSPF
	TAUCD	0.1	1.00E+10		1.00E-10	none	Lower value recommended. Used - **0.07**
	TAUCS	0.11	1.00E+10		1.00E-10	none	
	M	0.2			0	none	Recommended value of **0.05** (SC Doc)
SILT-**CLAY**-PM	D	0.0000295			0	0.003	STATSGO - **0.0000985**
	W	5.41 E-07			0	0.2	STATSGO - **0.000220506**
	RHO	2.8	2.65		2	4	2.65 - recommended by HSPF
	TAUCD	0.1275	1.00E+10		1.00E-10	none	Lower value recommended. Used - **0.065**
	TAUCS	0.13	1.00E+10		1.00E-10	none	
	M	12.5			0	none	Recommended value of 0.05 (SC Doc)
SSED-INIT	SAND	0					Initial value - should reflect BEDDEP - SND
	SILT	25					Initial value - should reflect BEDDEP - SLT
	CLAY	50					Initial value - should reflect BEDDEP - CLY
BED-INIT	BEDDEP-SND	0.5					STATSGO - **0.45**
	BEDDEP-SLT	0.05					STATSGO - **0.42**
	BEDDEP-CLY	0.4					STATSGO - **0.11**
GQ-QALFG	QALFG(7)	1					These Parameters control the association of E. coli to the Sediment. The values do not change the sediment composition/load values in the model.
GQ-SEDDECAY	KSUSP	0.03					
	THSUSP	1.024					
	KBED	0.03					
	THBED	1.024					
GQ-KD	SSAND	50000					
	SSILT	50000					
	SCLAY	50000					
	BSAND	0.0000001					
	BSILT	0.0000001					
	BCLAY	0.00001					
GQ-ADRATE	SSAND	0.00001					
	SSILT	0.00001					
	SCLAY	0.00001					
	BSAND	500000					
	BSILT	500000					
	BCLAY	500000					
GQ-SEDCONC	SSAND	0.214					
	SSILT	0.214					
	SCLAY	0.214					
	BSAND	0.214					
	BSILT	0.214					
	BCLAY	0.214					

Appendix F. Sediment Parameters for HSPF Model - Subbasin 45

			Range of Values				
Group	Parameter	UCI code values	Typical		Possible		Calculated Values
		current SB26	min	max	min	max	
SED-PARM1	CRVFG	0					**0**
	VSIVFG	0					**0**
	SDOPFG	1					**1**
SED-PARM2	SMPF	1	0	1	0	1	No reduction in erosion has been achieved through erosion control
	KRER	0.32	0.15	0.45	0.05	0.75	From USGS Data - **0.32**
	JRER	1.7	1.5	2.5	1	3	Start with value of 2.0 then calibrate
	AFFIX	0.1	0.03	0.1	0.01	0.5	Reduction of fine sediments by tillage - calibrated
	COVER	0	0	0.9	0	0.98	Vegetal cover land use
	NVSI	0	0	5	0	20	Atmospheic additions to sed storage
SED-PARM3	KSER	0.05	0.5	5	0.1	10	Obtained by calibration and prior experience
	JSER	0	1.5	2.5	1	3	Value of abou **2.0** recommended
	KGER	0.05	0	0.5	0	10	Only used when gullies present
	JGER	0	1	3	1	5	Start with value of **2.5** then calibrate
SED-STOR	DETS	0					Initial storage of sediment
SLD-PARM2	KEIM	0.1	0.5	5	0.1	10	Coeff. For wash off of accumulated sediments
	JEIM	5	1	2	1	3	Start with value of **1.5**
	ACCSDP	0.05	0	2	0	30	Primarily calculated through calibration
	REMSDP	0	0.03	0.2	0.01	1	Start with ~ 1.5 then calibrate
SLD-STOR	SLDS	0					Primarily calculated through calibration
HYDR-PARM1	AUX3FG	1					1 Dictates that the shear velocity and bed stress will be calculated
HYDR-PARM2	DB50	0.002871	0.01		0.0001	100	STATSGO - **0.009713**
SED-GENPARM	BEDWID	40			1	none	Width of the cross section over which sed is deposited
	BEDWRN	200			0.001	none	Bed depth greater than which warning message will be given
	POR	0.5	0.5		0.1	0.9	STATSGO - **0.15**
SAND-PM	D	0.0049			0.001	100	STATSGO - **0.0199**
	W	0.5244			0.5	12500	STATSGO - **7.274**
	RHO	2.575	2.65		1	4	**2.65** - recommended by HSPF
	KSAND	5			0	none	Suggested range of **0.05** to **0.5**
	EXPSND	5.3			0	none	Suggested range of **0.05** to **0.5**
SILT-CLAY-PM	D	0.00047			0	0.003	avg AASHTO - **0.00244**
	W	0.0001423			0	0.2	STATSGO - **0.1353**
	RHO	2.7	2.65		2	4	**2.65** - recommended by HSPF
	TAUCD	0.1	1.00E+10		1.00E-10	none	Lower value recommended. Used - **0.07**
	TAUCS	0.11	1.00E+10		1.00E-10	none	
	M	0.2			0	none	Recommended value of **0.05** (SC Doc)
SILT-**CLAY**-PM	D	0.0000295			0	0.003	STATSGO - **0.0000985**
	W	5.41 E-07			0	0.2	STATSGO - **0.000220506**
	RHO	2.8	2.65		2	4	2.65 - recommended by HSPF
	TAUCD	0.1275	1.00E+10		1.00E-10	none	Lower value recommended. Used - **0.065**
	TAUCS	0.13	1.00E+10		1.00E-10	none	
	M	12.5			0	none	Recommended value of 0.05 (SC Doc)
SSED-INIT	SAND	0					Initial value - should reflect BEDDEP - SND
	SILT	25					Initial value - should reflect BEDDEP - SLT
	CLAY	50					Initial value - should reflect BEDDEP - CLY
BED-INIT	BEDDEP-SND	0.5					STATSGO - **0.45**
	BEDDEP-SLT	0.05					STATSGO - **0.42**
	BEDDEP-CLY	0.4					STATSGO - **0.11**
GQ-QALFG	QALFG(7)	1					These Parameters control the association of E. coli to the Sediment. The values do not change the sediment composition/load values in the model.
GQ-SEDDECAY	KSUSP	0.03					
	THSUSP	1.024					
	KBED	0.03					
	THBED	1.024					
GQ-KD	SSAND	50000					
	SSILT	50000					
	SCLAY	50000					
	BSAND	0.0000001					
	BSILT	0.0000001					
	BCLAY	0.00001					
GQ-ADRATE	SSAND	0.00001					
	SSILT	0.00001					
	SCLAY	0.00001					
	BSAND	500000					
	BSILT	500000					
	BCLAY	500000					
GQ-SEDCONC	SSAND	0.214					
	SSILT	0.214					
	SCLAY	0.214					
	BSAND	0.214					
	BSILT	0.214					
	BCLAY	0.214					