CHAPTER 28

SWAT INPUT DATA: .PND, .DPD, .WPD, .RIB, .SFB

Ponds and wetlands are impoundments located within the subbasin area. These impoundments receive loadings only from the land area in the subbasin. The .pnd file contains parameter information and where to obtain detention and wet pond information, as well as retention-irrigation basin and sedimentation-filtration basin information used to model the water, sediment and nutrient balance for ponds and wetlands. All processes are modeled the same for ponds and wetlands except for outflow.

28.1 POND FILE (.PND)

Following is a brief description of the variables in the subbasin pond input file. They are listed in the order they appear within the file.

Variable name	Definition
TITLE	The first line of the file is reserved for user comments. The comments may take up to 80 spaces. The title line is not processed by the model and may be left blank.
POND SECTION TITLE	The second line of the file is reserved for a section title for the pond data. The title may take up to 80 spaces. The title line is not processed by the model and may be left blank.
PND_FR	Fraction of subbasin area that drains into ponds. The value for PND_FR should be between 0.0 and 1.0. Required.
PND_PSA	Surface area of ponds when filled to principal spillway (ha). Smaller impoundments usually do not have both a principal and emergency spillway. However, for SWAT to calculate the pond surface area each day the surface area at two different water volumes must to be defined. For simplicity, the same parameters required in reservoir input are used for ponds also. Variables referring to the principal spillway can be thought of as variables referring to the normal pond storage volume while variables referring to the emergency spillway can be thought of as variables referring to maximum pond storage volume. If users do not have information for the two water storage volumes, they may enter information for only one and allow SWAT to set values for the other based on the known surface area/volume. Required if PND_FR > 0.0.
PND_PVOL	Volume of water stored in ponds when filled to the principal spillway (10^4 m^3 H_2O). See explanation for PND_PSA for more information on this variable. Required if PND_FR > 0.0.

Variable name	Definition
PND_ESA	Surface area of ponds when filled to emergency spillway (ha). See explanation for PND_PSA for more information on this variable. Required if PND_FR > 0.0.
PND_EVOL	Volume of water stored in ponds when filled to the emergency spillway (10^4 m^3 H_2O). See explanation for PND_PSA for more information on this variable. Required if PND_FR > 0.0.
PND_VOL	Initial volume of water in ponds (10^4 m^3 H_2O). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for PND_VOL is not going to impact model results if the pond is small. However, if the pond is large a reasonably accurate value needs to be input for this value. Required if PND_FR > 0.0.
PND_SED	Initial sediment concentration in pond water (mg/L). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for PND_SED is not going to impact model results. Required if PND_FR > 0.0.
PND_NSED	Equilibrium sediment concentration in pond water (mg/L). The amount of suspended solid settling that occurs in the water body on a given day is calculated as a function of concentration. Settling occurs only when the sediment concentration in the water body exceeds the equilibrium sediment concentration specified by the user. Required if PND_FR > 0.0.

Variable name	Definition
PND_K	Hydraulic conductivity through bottom of ponds (mm/hr). If seepage occurs in the water body, the hydraulic conductivity must be set to a value other than 0. Required if PND_FR > 0.0.
IFLOD1	Beginning month of non-flood season. Pond outflow is calculated as a function of target storage. The target storage varies based on flood season and soil water content. The target pond volume is calculated: $V_{targ} = V_{em}$ when $mon_{fld,beg} < mon < mon_{fld,end}$, or $V_{targ} = V_{pr} + \frac{\left(1 - \min\left[\frac{SW}{FC}, \quad 1\right]\right)}{2} \cdot \left(V_{em} - V_{pr}\right)$ when $mon \le mon_{fld,beg}$ or $mon \ge mon_{fld,end}$. where V_{targ} is the target pond volume for a given day (m^3 H_2O), V_{em} is the volume of water held in the pond when filled to the emergency spillway (m^3 H_2O), V_{pr} is the volume of water held in the pond when filled to the principal spillway (m^3 H_2O), *SW* is the average soil water content in the subbasin (mm H_2O), *FC* is the water content of the subbasin soil at field capacity (mm H_2O), *mon* is the month of the year, $mon_{fld,beg}$ is the beginning month of the flood season, and $mon_{fld,end}$ is the ending month of the flood season. Once the target storage is defined, the outflow is calculated: $V_{flowout} = \frac{V - V_{targ}}{ND_{targ}}$ where $V_{flowout}$ is the volume of water flowing out of the water body during the day (m^3 H_2O), *V* is the volume of water stored in the pond (m^3 H_2O), V_{targ} is the target pond volume for a given day (m^3 H_2O), and ND_{targ} is the number of days required for the pond to reach target storage. Required if PND_FR > 0.0.

Variable name	Definition
IFLOD2	Ending month of non-flood season. See explanation for IFLOD1 for more information on this variable. Required if PND_FR > 0.0.
NDTARG	Number of days needed to reach target storage from current pond storage. The default value for NDTARG is 15 days. See explanation for IFLOD1 for more information on this variable. Required if PND_FR > 0.0.
PSETLP1	Phosphorus settling rate in pond for months IPND1 through IPND2 (m/year). The apparent settling velocity is most commonly reported in units of m/year and this is how the values are input to the model. For natural lakes, measured phosphorus settling velocities most frequently fall in the range of 5 to 20 m/year although values less than 1 m/year to over 200 m/year have been reported (Chapra, 1997). Panuska and Robertson (1999) noted that the range in apparent settling velocity values for man-made reservoirs tends to be significantly greater than for natural lakes. Higgins and Kim (1981) reported phosphorus apparent settling velocity values from –90 to 269 m/year for 18 reservoirs in Tennessee with a median value of 42.2 m/year. For 27 Midwestern reservoirs, Walker and Kiihner (1978) reported phosphorus apparent settling velocities ranging from –1 to 125 m/year with an average value of 12.7 m/year. ***A negative settling rate indicates that the reservoir sediments are a source of N or P; a positive settling rate indicates that the reservoir sediments are a sink for N or P***. Table 28-1 summarizes typical ranges in phosphorus settling velocity for different systems. See explanation for IPND1 for more information about this variable. Required of PND_FR > 0.0 and nutrient cycling is being modeled.

Variable name	Definition
PSETLP1, cont.	Table 28-1: Recommended apparent settling velocity values for phosphorus (Panuska and Robertson, 1999)

Nutrient Dynamics	Range in settling velocity values (m/year)
Shallow water bodies with high net internal phosphorus flux	$\nu \leq 0$
Water bodies with moderate net internal phosphorus flux	$1 < \nu < 5$
Water bodies with minimal net internal phosphorus flux	$5 < \nu < 16$
Water bodies with high net internal phosphorus removal	$\nu > 16$

PSETLP2	Phosphorus settling rate in pond for months other than IPND1-IPND2 (m/year). See explanation for PSETLP1 and IPND1 for more information about this variable. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
NSETLP1	Nitrogen settling rate in pond for months IPND1 through IPND2 (m/year). See explanation for PSETLP1 for more information about this variable. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
NSETLP2	Nitrogen settling rate in pond for months other than IPND1-IPND2 (m/year). See explanation for PSETLP1 for more information about this variable. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
CHLAP	Chlorophyll a production coefficient for ponds. The user-defined coefficient, Chlaco, is included to allow the user to adjust the predicted chlorophyll a concentration for limitations of nutrients other than phosphorus. When Chlaco is set to 1.00, no adjustments are made (the original equation is used). For most water bodies, the original equation will be adequate.

Variable name	Definition
CHLAP, cont.	The default value for CHLAP is 1.00, which uses the original equation. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
SECCIP	Water clarity coefficient for ponds. The clarity of the pond is expressed by the secci-disk depth (m) which is calculated as a function of chlorophyll *a*. The user-defined coefficient, SD_{co}, is included to allow the user to adjust the predicted secchi-disk depth for impacts of suspended sediment and other particulate matter on water clarity that are ignored by the original equation. When SD_{co} is set to 1.00, no adjustments are made (the original equation is used). For most water bodies, the original equation will be adequate. The default value for SECCIP is 1.00, which uses the original equation. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
PND_NO3	Initial concentration of NO_3-N in pond (mg N/L). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for PND_NO3 is not going to be important. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
PND_SOLP	Initial concentration of soluble P in pond (mg P/L). See comment for PND_NO3. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
PND_ORGN	Initial concentration of organic N in pond (mg N/L). See comment for PND_NO3. Required if PND_FR > 0.0 and nutrient cycling is being modeled.

Variable name	Definition
PND_ORGP	Initial concentration of organic P in pond (mg P/L). See comment for PND_NO3. Required if PND_FR > 0.0 and nutrient cycling is being modeled.
PND_D50	Median particle diameter of sediment (μm).

Sediment Class	Size (μm)	Approx. Size
Boulders	> 256,000	> Volley ball
Cobbles	> 64,000	> Tennis ball
Pebbles	> 2,000	> Match Head
Sand		
V. Course	1,500	
Medim	375	
V. Fine	94	
Silt		
V. Coarse	47	
Medium	11.7	No longer visible to the human eye
V. Fine	4.9	
Clay	1.95	

SWAT calculates the median sediment particle diameter for impoundments located within a subbasin using the equation:

$$d_{50} = \exp\left(0.41 \cdot \frac{m_c}{100} + 2.71 \cdot \frac{m_{silt}}{100} + 5.7 \cdot \frac{m_s}{100}\right)$$

where d_{50} is the median particle size of the sediment (μm), m_c is percent clay in the surface soil layer, m_{silt} is the percent silt in the surface soil layer, m_s is the percent sand in the surface soil layer.

Because ponds are located on the main channel network and receive sediment from the entire area upstream, defaulting the sand, silt, and clay fractions to those of a single subbasin or HRU in the upstream area is not appropriate. Instead the user is allowed to set the median particle size diameter to a representative value.

If no value is defined for the median particle diameter, the model will set PND_D50 = 10 μm.

Required.

Variable name	Definition
IPND1	Beginning month of mid-year nutrient settling "season". The model allows the user to define two settling rates for each nutrient and the time of the year during which each settling rate is used. A variation in settling rates is allowed so that impact of temperature and other seasonal factors may be accounted for in the modeling of nutrient settling. To use only one settling rate for the entire year, both variables for the nutrient may be set to the same value. Setting all variables to zero will cause the model to ignore settling of nutrients in the water body. Required if PND_FR > 0.0.
IPND2	Ending month of mid-year nutrient settling "season". See explanation for IPND1 for more information abour rhis variable. Required if PND_FR > 0.0.
WETLAND SECTION TITLE	The 28th line of the file is reserved for a section title for the wetland data. The title may take up to 80 spaces. The title line is not processed by the model and may be left blank.
WET_FR	Fraction of subbasin area that drains into wetlands. The value for WET_FR should be between 0.0 and 1.0. Required.
WET_NSA	Surface area of wetlands at normal water level (ha). For SWAT to calculate the wetland surface area each day the surface area at two different water volumes, normal and maximum, must to be defined. If users do not have information for the two water storage volumes, they may enter information for only one and allow SWAT to set values for the other based on the known surface area/volume. Required if WET_FR > 0.0.
WET_NVOL	Volume of water stored in wetlands when filled to normal water level (10^4 m^3 H_2O). See explanation for WET_NSA for more information on this variable. Required if WET_FR > 0.0.

Variable name	Definition
WET_MXSA	Surface area of wetlands at maximum water level (ha). See explanation for WET_NSA for more information on this variable. Required if WET_FR > 0.0.
WET_MXVOL	Volume of water stored in wetlands when filled to maximum water level (10^4 m^3 H_2O). See explanation for WET_NSA for more information on this variable. Required if WET_FR > 0.0.
WET_VOL	Initial volume of water in wetlands (10^4 m^3 H_2O). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for WET_VOL is not going to impact model results if the pond is small. However, if the wetland is large a reasonably accurate value needs to be input for this value. Required if WET_FR > 0.0.
WET_SED	Initial sediment concentration in wetland water (mg/L). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for WET_SED is not going to impact model results. Required if WET_FR > 0.0.
WET_NSED	Equilibrium sediment concentration in wetland water (mg/L). The amount of suspended solid settling that occurs in the water body on a given day is calculated as a function of concentration. Settling occurs only when the sediment concentration in the water body exceeds the equilibrium sediment concentration specified by the user. Required if WET_FR > 0.0.

Variable name	Definition
WET_K	Hydraulic conductivity through bottom of wetland (mm/hr). If seepage occurs in the water body, the hydraulic conductivity must be set to a value other than 0. Required if WET_FR > 0.0.
PSETLW1	Phosphorus settling rate in wetland for months IPND1 through IPND2 (m/year). See explanation for PSETLP1 and IPND1 for more information about this variable. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
PSETLW2	Phosphorus settling rate in wetlands for months other than IPND1-IPND2 (m/year). See explanation for PSETLP1 and IPND1 for more information about this variable. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
NSETLW1	Nitrogen settling rate in wetlands for months IPND1 through IPND2 (m/year). See explanation for PSETLP1 and IPND1 for more information about this variable. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
NSETLW2	Nitrogen settling rate in wetlands for months other than IPND1-IPND2 (m/year). See explanation for PSETLP1 and IPND1 for more information about this variable. Required if WET_FR > 0.0 and nutrient cycling is being modeled.

Variable name	Definition
CHLAW	Chlorophyll *a* production coefficient for wetlands. The user-defined coefficient, $Chla_{co}$, is included to allow the user to adjust the predicted chlorophyll *a* concentration for limitations of nutrients other than phosphorus. When $Chla_{co}$ is set to 1.00, no adjustments are made (the original equation is used). For most water bodies, the original equation will be adequate. The default value for CHLAW is 1.00, which uses the original equation. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
SECCIW	Water clarity coefficient for wetlands. The clarity of the wetland is expressed by the secci-disk depth (m) which is calculated as a function of chlorophyll *a*. The user-defined coefficient, SD_{co}, is included to allow the user to adjust the predicted secchi-disk depth for impacts of suspended sediment and other particulate matter on water clarity that are ignored by the original equation. When SD_{co} is set to 1.00, no adjustments are made (the original equation is used). For most water bodies, the original equation will be adequate. The default value for SECCIW is 1.00, which uses the original equation. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
WET_NO3	Initial concentration of NO_3-N in wetland (mg N/L). We recommend using a 1 year equilibration period for the model where the watershed simulation is set to start 1 year prior to the period of interest. This allows the model to get the water cycling properly before any comparisons between measured and simulated data are made. When an equilibration period is incorporated, the value for WET_NO3 is not going to be important. Required if WET_FR > 0.0 and nutrient cycling is being modeled.

Variable name	Definition
WET_SOLP	Initial concentration of soluble P in wetland (mg P/L). See comment for WET_NO3. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
WET_ORGN	Initial concentration of organic N in wetland (mg N/L). See comment for WET_NO3. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
WET_ORGP	Initial concentration of organic P in wetland (mg P/L). See comment for WET_NO3. Required if WET_FR > 0.0 and nutrient cycling is being modeled.
PNDEVCOEFF	Actual pond evaporation is equal to the potential evaporation times the pond evaporation coefficient. Default = 0.6
WETEVCOEFF	Actual wetlands evaporation is equal to the potential evaporation times the pond evaporation coefficient. Default = 0.6

DETENTION POND FILE (.DPD)

Following is a brief description of the variables in the detention pond input file. They are listed in the order they appear within the file.

Variable name	Definition
DTP_ONOFF	0 = the detention pond is inactive (no simulation), 1 = the detention pond is active. Default = 0
DTP_IMO	Month the detention pond became operational (1-12). Default =1
DTP_IYR	Year the detention pond became operational (e.g. 1980). Default =0

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Variable name	Definition
DTP_EVRSV	Evaporation coefficient. Actual pond evaporation is equal to the potential evaporation times the pond evaporation coefficient. Default =0.6
DTP_NUMWEIR	Number of weirs/orifice holes at the outlet. Default =1
DTP_NUMSTAGE	Number of levels/spillways associated with a particular weir. Default =1
DTP_PARM	BMP outflow hydrograph shape parameter. Default =0.14
DTP_TOTWRWID	Represents total constructed width of BMP across the creek or width of 100-year flood plain for the creek (m). Default =15
DTP_STAGDIS	0=use weir/orifice discharge equation to calculate outflow, 1=use stage-discharge relationship. Default =0
DTP_RELTYPE	Equations for Stage-Discharge relationship,1=exponential function, 2=linear, 3=logarithmic, 4=cubic, 5=power . Default =1
DTP_INTCEPT	User must enter this parameter. Applicable for all types of regression relationships except 'Exponential'.
DTP_EXPONT	User must enter a value if the stage-discharge relationship is 'Exponential'. Can be blank/zero for other regression relationships.
DTP_COEF1	For all regression relationships user must enter a value. For 'polynomial' relationship this represents the coefficient of 3rd degree (x3).
DTP_COEF2	When using 'Polynomial' relationship user should enter a value. It represents the coefficient of 2nd degree (x2).
DTP_COEF3	When using 'Polynomial' relationship user should enter a value. It represents the coefficient of 1st degree (x1).
DTP_WEIRTYPE	1=rectangular weir, 2=circular hole. Default =1

Variable name	Definition
DTP_WEIRDIM	Weir dimensions, 1=read user input, 0=use estimated values calculated by orifice equation or weir equation. Default =1
DTP_WDRATIO	Width vs Depth ratio for rectangular weirs. Default =1
DTP_DEPWEIR	Depth of rectangular weir (m). Default =0.5
DTP_DIAWEIR	Diameter of circular holes (m). Default =0.5
DTP_ADDON	The distance between spillway levels (m). Default =0.1
DTP_FLOWRATE	Maximum discharge from each stage of the weir/hole (m3/s). Default =2
DTP_CDIS	Discharge coefficient for weir/orifice hole flow. Default =1
DTP_RETPERD	Return period at different stages (currently not used) (years). Default =2
DTP_PCPRET	Precipitation for different return periods (currently not used) (mm). Default =100

WET POND FILE (.WPD)

Following is a brief description of the variables in the wet pond input file. They are listed in the order they appear within the file.

Variable name	Definition
WTP_ONOFF	0= the wet pond is inactive (no simulation), 1=active. Default =0
WTP_IMO	Month the wet pond became operational (1-12). Default =1
WTP_IYR	Year the wet pond became operational (e.g. 1980). Default =0

Variable name	Definition
WTP_K	Hydraulic conductivity through bottom of ponds (mm/hr). Default =0.1
WTP_EVRSV	Evaporation coefficient. Actual pond evaporation is equal to the potential evaporation times the pond evaporation coefficient. Default =0.6
WTP_HYDEFF	Hydraulic efficiency factor . Default =0.7
WTP_DP	Median particle diameter of suspended solids, mm. Default =0.03
WTP_QI	Volume of water in the pond at the beginning of simulation, m^3. Default =0
WTP_SEDI	Sediment concentration in pond water at the beginning of simulation (mg/l). Default =0
WTP_SEDE	Normal sediment concentration in pond water (mg/l). Default =0
WTP_DIM	Pond dimensions, 1=read user input, 0=use model estimated values . Default =1
WTP_PVOL	Runoff volume to fill the permanent pool including forbay to the overflow spillway (m3). Default =5000
WTP_PDEPTH	Depth of the permanent pool (m). Default =1.5
WTP_SDSLOPE	Pond side slope. Default =4
WTP_LENWDTH	Length to width ratio of the pond bed. Default =2
WTP_STAGDIS	0=calculate outflow based on outlet properties, 1=use stage-discharge relationship. Default =0

Variable name	Definition
WTP_SDTYPE	Equations for Stage-Discharge relationship,1=exponential function, 2=linear, 3=logarithmic, 4=cubic, 5=power . Default =1
WTP_SDINTC	User must enter this parameter. Applicable for all types of regression relationships except 'Exponential'.
WTP_SDEXP	User must enter a value if the stage-discharge relationship is 'Exponential'. Can be blank/zero for other regression relationships.
WTP_SDC1	For all regression relationships user must enter a value. For 'polynomial' relationship this represents the coefficient of 3 rd degree (x3).
WTP_SDC2	When using 'Polynomial' relationship user should enter a value. It represents the coefficient of 2 nd degree (x2).
WTP_SDC3	When using 'Polynomial' relationship user should enter a value. It represents the coefficient of 1st degree (x2).
WTP_EXTDEPTH	Depth of extended detention (m). Default =1.5
WTP_PDIA	Diameter of inverted PVC pipe that controls outflow, (m). Default =0.1
WTP_PLEN	Length of inverted PVC pipe at the outlet (m). Default =4
WTP_PMANN	Manning's coefficient of the PVC pipe. Default =0.01
WTP_PLOSS	Pipe entrance loss coefficient; 0 = no loss Default = 0.2

RETENTION-IRRIGATION BASIN FILE (.RIB)

Following is a brief description of the variables in the retention-irrigation basin input file. They are listed in the order they appear within the file.

Variable name	Definition
WTP_PLOSS	Pipe entrance loss coefficient, 0=no loss. Default =0.2

Variable name	Definition
NUM_RI	Number of R-Is in the subbasin. Default =0
RI_NOIRR	LU types that are not irrigated by this BMP.
ID	ID number of retention-irrigation basin.
RI_FR	Fraction of urban runoff that discharges to the retention irrigation. Default =0
RI_DIM	Retention pond dimensions, 1=read user input, 0=use model estimated values . Default =1
RI_IM	Month the retention-irrigation became operational (1-12). Default =1
RI_IY	Year the retention-irrigation became operational (e.g. 1980). Default =0
RI_SA	Surface area of retention pond (m^2). Default =300
RI_PVOL	Runoff volume to fill the retention ponds to the overflow spillway (m^3). Default =500
RI_QI	Volume of water in the retention pond at the beginning of simulation (m^3). Default =0
RI_K	Hydraulic conductivity through bottom of ponds (mm/hr). Default =0.1
RI_DD	Retention pond drawdown time (hours). Default =60
RI_EVRSV	Evaporation coefficient. Actual pond evaporation is equal to the potential evaporation times the pond evaporation coefficient. Default =0.6

SEDIMENTATION-FILTRATION BASIN FILE (.SFB)

Following is a brief description of the variables in the sedimentation-filtration basin input file. They are listed in the order they appear within the file.

Variable name	Definition
NUM_SF	Number of SED-FILs in the subbasin. Default =0
ID NUM	ID number of sedimentation-filtration basin.
SF_FR	Fraction of urban runoff that discharges to the SED-FIL Default=0
SF_TYP	SED-FIL type, 1=Full scale, 2=partial scale, 3=sedimentation pond only. Default =1
SF_DIM	SED-FIL dimensions, 1=read user input, 0=use model estimated values. Default =1
SF_PTP	0=No outflow control for sand filter, 1=outflow is controlled by orifice pipe. Default =0
SF_IM	Month the SED-FILs became operational (1-12). Default =1
SF_IY	Year the SED-FILs became operational (e.g. 1980). Default =0
SP_SA	Surface area of sedimentation ponds (m^2). Default =300
SP_PVOL	Runoff volume to fill the sedimentation ponds to the overflow spillway (m^3). Default =500
SP_QFG	0=use model estimate for outlet pipe diameter (SP_PD), 1=read user input. Default =1
SP_PD	Outlet orifice pipe diameter (mm). Default =152

Variable name	Definition
SP_QI	Volume of water in the sedimentation pond at the beginning of simulation (m^3). Default =0
SP_BPW	Spillway overflow weir width (m) Default =2
SP_K	Hydraulic conductivity through bottom of ponds (mm/hr). Default =0.1
SP_DP	Median particle diameter of suspended solids (mm). Default =0.03
SP_SEDI	Sediment concentration in pond water at the beginning of simulation (mg/l). Default =0
SP_SEDE	Normal sediment concentration in pond water (mg/l). Default =0
FT_SA	Total surface area of filter (m^2). Default =250
FT_FSA	Fraction of infiltration bed in the filtration basin (m^2/ m^2). Default =0.8
FT_QFG	0=Model estimates the outlet pipe diameter (SP_PD), 1=read user input. Default =1
FT_PD	Outlet orifice pipe diameter (mm). Default =152
FT_DEP	Depth of filter media (mm). Default =450
FT_BPW	Spillway overflow weir width (m). Default =2
FT_K	Hydraulic conductivity of the filter media (mm/hr). Default =100
FT_DP	Median particle diameter of suspended solids (mm). Default =0.03
FT_DC	Median diameter of filter media (mm).

Variable name	Definition
FT_H	Maximum temporary ponding depth in the filtration basin (mm). Default =400
FT_POR	Porosity of the filter media. Default =0.4
TSS_DEN	Density of TSS particles in the stormwater (g/cm^3) Default =1.5
FT_ALP	Filter attachment efficiency. Default =0.3

The pond input file is a free format file. The variables may be placed in any position the user wishes on the line. Values for variables classified as integers *should not* include a decimal while values for variables classified as reals *must* contain a decimal. A blank space denotes the end of an input value and the beginning of the next value if there is another on the line. The format of the pond input file is:

Variable name	Line #	Format	F90 Format
TITLE	1	character	a80
POND SECT. TITLE	2	character	a80
PND_FR	3	real	free
PND_PSA	4	real	free
PND_PVOL	5	real	free
PND_ESA	6	real	free
PND_EVOL	7	real	free
PND_VOL	8	real	free
PND_SED	9	real	free
PND_NSED	10	real	free
PND_K	11	real	free
IFLOD1	12	integer	free
IFLOD2	13	integer	free
NDTARG	14	integer	free
PSETLP1	15	real	free
PSETLP2	16	real	free
NSETLP1	17	real	free
NSETLP2	18	real	free

Variable name	Line #	Format	F90 Format
CHLAP	19	real	free
SECCIP	20	real	free
PND_NO3	21	real	free
PND_SOLP	22	real	free
PND_ORGN	23	real	free
PND_ORGP	24	real	free
POND/WETLAND SECT. TITLE	25	character	a80
IPND1	26	integer	free
IPND2	27	integer	free
WETLAND SECT. TITLE	28	character	a80
WET_FR	29	real	free
WET_NSA	30	real	free
WET_NVOL	31	real	free
WET_MXSA	32	real	free
WET_MXVOL	33	real	free
WET_VOL	34	real	free
WET_SED	35	real	free
WET_NSED	36	real	free
WET_K	37	real	free
PSETLW1	38	real	free
PSETLW2	39	real	free
NSETLW1	40	real	free
NSETLW2	41	real	free
CHLAW	42	real	free
SECCIW	43	real	free
WET_NO3	44	real	free
WET_SOLP	45	real	free
WET_ORGN	46	real	free
WET_ORGP	47	real	free
PNDEVCOEFF	48	real	free
WETEVCOEFF	49	real	free

Detention Pond (.DPD FILE)

Variable name	Line #	Format	F90 Format
TITLE	1	character	A80
DTP_ONOFF	2	integer	free
DTP_IMO	3	integer	free
DTP_IYR	4	integer	free
DTP_EVRSV	5	real	free
DTP_NUMWEIR	6	real	free
DTP_NUMSTAGE	7	real	free
DTP_PARM	8	real	free
DTP_TOTWRWID	9	real	free
DTP_STAGDIS	10	integer	free
DTP_RELTYPE	11	integer	free
DTP_INTCEPT	12	integer	free
DTP_EXPONT	13	real	free
DTP_COEF1	14	real	free
DTP_COEF2	15	real	free
DTP_COEF3	16	real	free
DTP_WEIRTYPE	17	integer	free
DTP_WEIRDIM	18	integer	free
DTP_WDRATIO	19	real	free
DTP_DEPWEIR	20	real	free
DTP_DIAWEIR	21	real	free
DTP_ADDON	22	real	free
DTP_FLOWRATE	23	real	free
DTP_CDIS	24	real	free
DTP_RETPERD	25	integer	free
DTP_PCPRET	26	real	free

Wet Pond (.WPD FILE)

Variable name	Line #	Format	F90 Format
TITLE	1	character	a80
WTP_ONOFF	2	integer	free
WTP_IMO	3	integer	free
WTP_IYR	4	integer	free
WTP_K	5	real	free
WTP_EVRSV	6	real	free
WTP_HYDEFF	7	real	free
WTP_DP	8	real	free
WTP_QI	9	real	free
WTP_SEDI	10	integer	free
WTP_SEDE	11	integer	free
WTP_DIM	12	integer	free
WTP_PVOL	13	real	free
WTP_PDEPTH	14	real	free
WTP_SDSLOPE	15	real	free
WTP_LENWDTH	16	real	free
WTP_STAGDIS	17	integer	free
WTP_SDTYPE	18	integer	free
WTP_SDINTC	19	real	free
WTP_SDEXP	20	real	free
WTP_SDC1	21	real	free
WTP_SDC2	22	real	free
WTP_SDC3	23	real	free
WTP_EXTDEPTH	24	real	free
WTP_PDIA	25	real	free
WTP_PLEN	26	real	free
WTP_PMANN	27	real	free
WTP_PLOSS	28	real	free

Retention-Irrigation Pond (.RIB FILE)

Variable name	*Line #*	*Format*	*F90 Format*
TITLE	1	character	a80
NUM_RI	2	integer	free
LUS	3	integer	free
TITLE	4	character	free
RI_NOIRR	4	real	free
RI_FR	5	real	free
RI_DIM	6	real	free
RI_IM	7	real	free
RI_IY	8	real	free
RI_SA	9	integer	free
RI_VOL	10	integer	free
RI_QI	11	integer	free
RI_K	12	real	free
RI_DD	13	real	free
RI_EVRSV	14	real	free

Sedimentation-Filtration Pond (.SFB FILE)

Variable name	*Line #*	*Format*	*F90 Format*
TITLE	1	character	a80
NUM_SF	2	integer	free
TITLE	3	character	free
SF_FR	4	real	free
SF_TYP	5	integer	free
SF_DIM	6	integer	free
SF_PTP	7	integer	free
SF_IM	8	integer	free
SF_IY	9	integer	free
SP_SA	10	real	free
SP_PVOL	11	real	free
SP_QFG	12	integer	free
SP_PD	13	real	free
SP_QI	14	real	free

Variable name	*Line #*	*Format*	*F90 Format*
SP_BPW	15	real	free
SP_K	16	real	free
SP_DP	17	real	free
SP_SEDI	18	real	free
SP_SEDE	19	real	free
FT_SA	20	real	free
FT_FSA	21	real	free
FT_QFG	22	real	free
FT_PD	23	real	free
FT_DEP	24	real	free
FT_BPW	25	real	free
FT_K	26	real	free
FT_DP	27	real	free
FT_DC	28	real	free
FT_H	29	real	free
FT_POR	30	real	free
TSS_DEN	31	real	free
FT_ALP	32	real	free

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