

# **INI-files SOBEK 2**

**Description of the used INI-files in SOBEK 2**

**Technical Reference Manual**

Version: 0.00  
SVN Revision: 46106

June 17, 2018

## INI-files SOBEK 2, Technical Reference Manual

### Published and printed by:

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# 1 SOBEKSIM.INI

## 1.1 Time step estimation

for all 1D links:

$$facsum = \sum_{m=1}^{n_{links}} \left( \frac{q_m}{vl1_m Up} \right)^2 \quad (1.1)$$

$$facmax = \max \left( \frac{q_m}{vl1_m Up} \right), m = 1..n_{links} \quad (1.2)$$

For all 2d links:

$$facsum = \sum_{m=1}^{n_{links}} \left( \frac{u_m}{dx_m} \right)^2 \quad (1.3)$$

$$facmax = \max \left( \frac{u_m}{dx_m} \right), m = 1..n_{links} \quad (1.4)$$

For all links

$$facavg = \frac{facsum}{n_{links}} \quad (1.5)$$

$$dt = \max \left( dt_{min}, \frac{Cfl_{limiter}}{facmax} \right) \quad (1.6)$$

## 1.2 General

---

Keyword:	Version
Default:	PLUV2.70
Description:	

---

Keyword:	Language
Default:	1
Description:	

---

### 1.3 InitialConditions

---

Keyword: InitialEmptyWells  
 Default: 0  
 Description: Switch for starting with dry system; 1 = on, 0 = off

---

Keyword: InitialSalinity  
 Default: 0.0  
 Description:

---

### 1.4 RunoffOptions

---

Keyword: FixedQlatAtBranch  
 Default: -1 (true)  
 Description: If FixedQlatAtBranch = True then SplitQlatAtBranch = False

---

Keyword: MultipleStormEvents  
 Default: 0 (false)  
 Description:

---

Keyword: SplitQlatAtBranch  
 Default: 0 (false)  
 Description:

---

### 1.5 ResultsNodes

---

Keyword: Density  
 Default: 0  
 Description:

---

Keyword: Dispersion  
 Default: 0  
 Description:

---

Keyword: Freeboard  
 Default: 0  
 Description:

---

Keyword: LateralToGW  
 Default: 0  
 Description:

---

Keyword: LateralOnNodes  
 Default: 0  
 Description:

---

---

Keyword: LateralToTrench  
Default: 0  
Description:

---

Keyword: LevelFromStreetLevel  
Default: 0  
Description:

---

Keyword: RunOff  
Default: 0  
Description:

---

Keyword: Salinity  
Default: 0  
Description:

---

Keyword: TimeWaterOnStreet  
Default: 0  
Description:

---

Keyword: TotalArea  
Default: 0  
Description:

---

Keyword: TotalWidth  
Default: 0  
Description:

---

Keyword: Volume  
Default: 0  
Description:

---

Keyword: VolumeError  
Default: 0  
Description:

---

Keyword: VolumeInTrench  
Default: 0  
Description:

---

Keyword: VolumesOnStreet  
Default: 0  
Description:

---

Keyword: WaterDepth  
Default: 0  
Description:

---

Keyword: WaterLevel  
Default: -1  
Description:

---

Keyword: WaterLevelInTrench  
 Default: 0  
 Description:

---

Keyword: WaterOnStreet  
 Default: 0  
 Description:

---

## 1.6 ResultsBranches

Keyword: Chezy  
 Default: 0  
 Description:

---

Keyword: Discharge  
 Default: -1  
 Description:

---

Keyword: EnergyHeadMethod  
 Default: 0  
 Description: The energy levels are computed, when LevelsOutputOnPipes/=0  
 EnergyHeadMethod/10 ==1: the water level at the gridpoint is used  
 EnergyHeadMethod/10 ==2: the water level is computed, taking the  
 Froude number into account  
 Mod(EnergyHeadMethod,10) == 1: the velocity in the velocity point is used  
 Mod(EnergyHeadMethod,10) == 2: the velocity is computed by Q/A

---

Keyword: Levelsoutputonpipes  
 Default: 0  
 Description:

---

Keyword: RiverSubsectionParameters  
 Default: 0  
 Description:

---

Keyword: SedimentFrijlink  
 Default: 0  
 Description:

---

Keyword: SedimentVanRijn  
 Default: 0  
 Description:

---

Keyword: Velocity  
 Default: 0  
 Description:

---



---

Keyword: WaterLevelSlope  
Default: 0  
Description:

---

Keyword: Wind  
Default: 0  
Description:

---

Keyword: TWind  
Default: 0  
Description:

---

Keyword: FWind  
Default: 0  
Description:

---

## 1.7 ResultsStructures

---

Keyword: CrestLevel  
Default: 0  
Description:

---

Keyword: CrestWidth  
Default: 0  
Description:

---

Keyword: Discharge  
Default: 1  
Description:

---

Keyword: GateLowerEdgeLevel  
Default: 0  
Description:

---

Keyword: Head  
Default: 0  
Description:

---

Keyword: OpeningsArea  
Default: 0  
Description:

---

Keyword: PressureDifference  
Default: 0  
Description:

---

---

Keyword: ThresholdForSpillCountInHours  
Default: 1000  
Description: ThresholdForSpillCountInHours=12  
This means that if a structure does not work for more than 12 hours, and then starts again, that you have 2 spills (and later maybe even 3 or more).

---

Keyword: Velocity  
Default: 0  
Description:

---

Keyword: WaterLevel  
Default: 0  
Description: Water levels upstream and downstream of structure

---

Keyword: Waterleveloncrest  
Default: 0  
Description:

---

## 1.8 ResultsPumps

---

Keyword: PumpResults  
Default: 0  
Description:

---

## 1.9 ResultsGeneral

---

Keyword: ActualValue  
Default: -1 (true)  
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

---

Keyword: DelwaqNoStaggeredGrid  
Default: 0 (false)  
Description:

---

Keyword: FlowAnalysisTimeSeries  
Default: 0 (false)  
Description:

---

Keyword: MaximumValue  
Default: 0 (false)  
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

---

---

Keyword: MeanValue  
Default: 0 (false)  
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

---

Keyword: SobeksimStamp  
Default: 0  
Description:

---

Keyword: Zero2DRainEvap2Delwaq  
Default: 0 (false)  
Description:

---

### 1.10 ResultsGrid

---

Keyword: 1DFlowDischargeMeasuringSection  
Default: 0  
Description:

---

### 1.11 Sediment

---

Keyword: DepthUsedForSediment  
Default: 0.3  
Description:

---

Keyword: D50  
Default: 0.0005  
Description:

---

Keyword: D90  
Default: 0.0010  
Description:

---

### 1.12 Specials

---

Keyword: DesignFactorDLG  
Default: 1.0  
Description: Design Factor used in the Rational Method

---

### 1.13 Indication

---

Keyword: VelocityBranchSegments  
 Default: 0.5  
 Description:

---

Keyword: VelocityStructures  
 Default: 0.75  
 Description:

---

### 1.14 NumericalParameters

---

Keyword: AccelerationTermFactor  
 Default: 1.0  
 Description:

---

Keyword: AccurateVersusSpeed  
 Default: 3  
 Description: Iteration criteria:  
 1 = Less Accurate / Fast (1.0E-6)  
 2 = Medium (1.0E-9)  
 3 = Accurate / Slow (1.0E-12)

---

Keyword: CourantNumber  
 Default: 1  
 Description: Maximum allowable Courant number  $Cfl_{max}$ .

---

Keyword: DtMinimum  
 Default: 0.01  
 Description: Minimum time step for the Courant time step estimation  $dt_{min}$  (source code:  $dt\_pluv\_min$ )

---

Keyword: EpsilonValueVolume  
 Default: 0.005  
 Description: Source code name *epsvol*. Accuracy factor for volumes.

---

Keyword: EpsilonValueWaterDepth  
 Default: 0.005  
 Description: Source code name *epss*. Accuracy factor for water levels.

---

Keyword: FloodingDividedByDrying  
 Default: 2.0  
 Description:

---

---

Keyword:	Gravity
Default:	9.81
Description:	

---

Keyword:	MaxDegree
Default:	2
Description:	

---

Keyword:	MaxIterations
Default:	8
Description:	

---

Keyword:	MinimumSurfaceatStreet
Default:	0.1
Description:	

---

Keyword:	MinimumSurfaceinNode
Default:	0.1
Description:	

---

Keyword:	MinumumLength
Default:	1.0
Description:	

---

Keyword:	RelaxationFactor
Default:	1.0
Description:	

---

Keyword:	Rho
Default:	1000
Description:	

---

Keyword:	StructureInertiaDampingFactor
Default:	1.0
Description:	

---

Keyword:	Theta
Default:	1.0
Description:	

---

Keyword:	ThresholdValueDrying
Default:	0.005 (ThresholdValueFlooding/FloodingDividedByDrying)
Description:	

---

Keyword:	ThresholdValueFlooding
Default:	0.01
Description:	

---

Keyword:	ThresholdValueDryingFLS
Default:	0.0005 (ThresholdValueFloodingFLS/FloodingDividedByDrying)
Description:	

---

---

Keyword: ThresholdValueFloodingFLS  
 Default: 0.001  
 Description:

---

Keyword: UseTimeStepReducerStructures  
 Default: 0 (false)  
 Description: Source code name *structimestepreducer*.  
 When at the end of the calculation of a time step a weir or orifice is assumed to be dry ( $kfu(m) == 0$ ), but on one side or both sides of this structure the water level is above the crest level there is a contradiction. This can be the result of an oscillation, therefore the time step is reduced and the current time step is recomputed.

---

### 1.15 SimulationOptions

---

Keyword: AllowableLargerTimestep  
 Default: 0  
 Description: In source code denoted as *largerdt*. As long as the number of iterations is less than *largerdt Cfl<sub>div</sub>* can be reduced for each time step by:

$$Cfl_{div} = \max(0.01, \frac{facavg}{facmax}, \sqrt{0.5} \cdot Cfl_{div}) \quad (1.7)$$

When the number of iterations exceeds *largerdt Cfl<sub>div</sub>* remains unchanged. This seems to be a bug since two lines of code is used to leave *Cfl<sub>div</sub>* unchanged.

---

Keyword: AllowableTimeStepLimiter  
 Default: 30  
 Description: Variable *maxlimitdt* in *limitdt* is set to *maxlimitdt*, in subroutine SETBACK. In subroutine PLDTMX ( estimation of the new time step) *limitdt* is set to *limitdt -1*. As long as *limitdt > 0* a more conservative time step estimation is used:

$$Cfl_{limiter} = 0.9 \cdot \frac{Cfl_{max}}{Cfl_{div}} \quad (1.8)$$


---

Keyword: ASCIIFileUVComponent  
 Default: 1 (true)  
 Description: In source code set to true anyway, so always true.

---

Keyword: Cflcheckalllinks  
 Default: 0 (false)  
 Description:

---

Keyword:	Channel
Default:	1 (true)
Description:	
Keyword:	Debug
Default:	0
Description:	
Keyword:	DebugTime
Default:	0
Description:	
Keyword:	DepthsBelowBobs
Default:	0
Description:	
Keyword:	DispMaxFactor
Default:	0.45
Description:	
Keyword:	DumplInput
Default:	0
Description:	
Keyword:	ladvec1D
Default:	1
Description:	Advection Type in 1D Flow ladvec1D = 1: Conservation of Momentum ladvec1D = 2: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction and Expansion ladvec1D = 3: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction Only ladvec1D = 4: Balanced Average of Conservation of Momentum and Conservation of Energy in Expansion Only ladvec1D = 5: Balanced Average of Conservation of Momentum and Conservation of Energy but no Contraction and Expansion Losses
Keyword:	Limtyphu1D
Default:	1
Description:	Limiter Type for Estimating Flow Area at Velocity Point in 1D Flow Limtyphu1D = 1: Upwind Limtyphu1D = 2: Central in Cross-Sections Limtyphu1D = 3: Central in Water Levels
Keyword:	Manhloss
Default:	0
Description:	

Keyword: MaxAdjacentEdges  
 Default: 20  
 Description:

---

Keyword: MissingValue  
 Default: -999.999  
 Description:

---

Keyword: Momdilution1D  
 Default: 1  
 Description: Advection Control Volume Based upon Flow Area or Total Area in 1D Links  
 Momdilution1D = 1: Total Area  
 Momdilution1D = 2: Flow Area with Account for Storage Sink Term  
 Momdilution1D = 3: Flow Area

---

Keyword: OnlineCommunicationFile  
 Default: "  
 Description:

---

Keyword: Onlineplot  
 Default: 0 (false)  
 Description:

---

Keyword: OnLineWQ  
 Default: 0 (false)  
 Description:

---

Keyword: PercentAllowableVolumeError  
 Default: 1  
 Description:

---

Keyword: PreissmannMinClosedManholes  
 Default: 0.001  
 Description:

---

Keyword: Readsamples  
 Default: 0 (false)  
 Description:

---

Keyword: River  
 Default: 0 (false)  
 Description:

---

Keyword: RTCInUse  
 Default: 0  
 Description:

---

Keyword: RunoffInUse  
 Default: 0  
 Description:

---



Keyword:	Salinity
Default:	0
Description:	
Keyword:	Sewer
Default:	0
Description:	
Keyword:	SimulationSynchron
Default:	0
Description:	
Keyword:	SiphonUpstreamThresholdSwitchOff
Default:	0.1
Description:	
Keyword:	Skipstructimestepreduction
Default:	0
Description:	Weirs and orifices can oscillate and for both structure types the flow direction can be limited to one direction only. When at the end of the iteration loop, the computed flow direction is incorrect, the time step is reduced and the current time step is recomputed. When "Skipstructimestepreduction" is set to true, this check is not performed.
Keyword:	StrucFlowDirectionAccuracyFactor
Default:	1.0
Description:	source code name <i>sfd_a_factor</i> . The accuracy factor used in Skipstructimestepreduction is equal to $StrucFlowDirectionAccuracyFactor \cdot Epsilon Value WaterDepth$
Keyword:	StructureStabilityFactor
Default:	0
Description:	
Keyword:	ThresholdForSummerDike
Default:	0.4
Description:	
Keyword:	TimersOutputFrequency
Default:	1
Description:	
Keyword:	Treat2DFrictiontermsameas1D
Default:	0 (false)
Description:	
Keyword:	Use1D2DNode
Default:	-1 (true)
Description:	

Keyword: Use1D2DRestartInputFile  
 Default: 0 (false)  
 Description:

---

Keyword: Use1D2DRestartOutputFile  
 Default: 0 (false)  
 Description:

---

Keyword: Use2DWindFrictSameAs1DFormulation  
 Default: -1 (true)  
 Description:

---

Keyword: UseExtraFrictionDepth1D  
 Default: -1 (true)  
 Description:

---

Keyword: UseFls  
 Default: 0 (false)  
 Description:

---

Keyword: UseGridAsSurface  
 Default: -1 (true)  
 Description:

---

Keyword: UseTimers  
 Default: 0 (false)  
 Description:

---

Keyword: Usevariableteta  
 Default: 0 (false)  
 Description:

---

Keyword: VolumeCheck  
 Default: 0 (false)  
 Description:

---

Keyword: Writesamples  
 Default: 0 (false)  
 Description:

---

### 1.16 SteadyState

Keyword: ComputeSteadyState  
 Default: 0 (false)  
 Description:

---

Keyword: Dtsteady  
 Default: 7200  
 Description:

---

---

Keyword: EpsMaxU  
 Default: 1e-6  
 Description:

---

Keyword: Ntendcontrolsteady  
 Default: 200  
 Description:

---

Keyword: Ntintcontrolsteady  
 Default: 20  
 Description:

---

Keyword: Ntmaxsteady  
 Default: 1500  
 Description:

---

### 1.17 Salinity

---

Keyword: DiffusionAtBoundaries  
 Default: false  
 Description:

---

Keyword: SaltComputation  
 Default: 0 (false)  
 Description:

---

### 1.18 AdvancedOptions

---

Keyword: CalculateDelwaqOutput  
 Default: 0 (false)  
 Description:

---

Keyword: ExtraResistanceGeneralStructure  
 Default: 0.0  
 Description:

---

Keyword: LateralLocation  
 Default: 1  
 Description: 0 = Laterals at Nearest Water Level Point  
 1 = Laterals at Lowest Water Level Point

---

Keyword: MaxLoweringCrossAtCulvert  
 Default: 0.0  
 Description:

---

---

Keyword: MaxVolFact  
Default: 0.9  
Description:

---

Keyword: NoNegativeQlatWhenThereIsNoWater  
Default: 0  
Description:

---

Keyword: TransitionHeightSD  
Default: 1.0  
Description:

---

### 1.19 Overland Flow

---

Keyword: 2DEddyViscosity  
Default: 0.0  
Description:

---

Keyword: DefaultChezy1D2DConnections  
Default: 1000  
Description:

---

Keyword: Limtyp  
Default: 1  
Description:

---

Keyword: NorocoBufferFactor  
Default: 2  
Description: Factor for allocating memory for irocol table, if array size too small, increase buffer

---

Keyword: Noslip  
Default: 0  
Description:

---

### 1.20 ResultsARCVIEW

---

Keyword: FilePath  
Default: ../WORK/  
Description:

---

Keyword: UvelocityVvelocityResultingvelocityNoDecimalsInASCIIMapFiles  
Default: 4  
Description:

---

---

Keyword: WaterlevelWaterdepthBedlevelNoDecimalsInASCIIMapFiles  
Default: 4  
Description:

---

Deltares, 2016. "BIBTEX key with no entry, needed if no citations are made in the document."

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