

WBP Dorfbach Lüscherz, 6200302

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

WBP Dorfbach Lüscherz, 6200302

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units CMS
Process Models:
 Rainfall/Runoff NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
Flow Routing Method DYNWAVE
Starting Date MAR-17-2015 00:00:00
Ending Date MAR-17-2015 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Routing Time Step 30.00 sec

WARNING 03: negative offset ignored for Link C1
WARNING 03: negative offset ignored for Link C2
WARNING 03: negative offset ignored for Link C3
WARNING 03: negative offset ignored for Link C4
WARNING 03: negative offset ignored for Link C5
WARNING 03: negative offset ignored for Link C9
WARNING 03: negative offset ignored for Link C10
WARNING 03: negative offset ignored for Link C10
WARNING 03: negative offset ignored for Link C12

Element Count

Number of rain gages 0
Number of subcatchments ... 0
Number of nodes 9
Number of links 8
Number of pollutants 0
Number of land uses 0

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
KS1	JUNCTION	433.67	1.40	0.0	Yes
KS2	JUNCTION	432.37	2.38	0.0	
KS3	JUNCTION	431.60	3.07	0.0	
KS4	JUNCTION	431.15	2.40	0.0	
KS5	JUNCTION	430.74	3.91	0.0	
KS6	JUNCTION	430.01	2.64	0.0	
KS7	JUNCTION	429.32	1.87	0.0	
J9	JUNCTION	432.59	2.22	0.0	
Mündung	OUTFALL	428.53	1.40	0.0	

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Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J9	KS2	CONDUIT	10.0	2.0004	0.0150
C2	KS2	KS3	CONDUIT	36.0	2.0004	0.0150
C3	KS3	KS4	CONDUIT	20.0	2.0004	0.0150
C4	KS4	KS5	CONDUIT	18.0	2.0004	0.0150
C5	KS5	KS6	CONDUIT	34.0	2.0004	0.0150
C9	KS6	KS7	CONDUIT	40.0	1.6002	0.0150
C10	KS7	Mündung	CONDUIT	53.0	1.4907	0.0150
C12	KS1	J9	CONDUIT	53.0	2.0004	0.0150

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C2	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C3	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C4	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C5	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C9	CIRCULAR	1.40	1.54	0.35	1.40	1	6.45
C10	CIRCULAR	1.40	1.54	0.35	1.40	1	6.22
C12	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21

Flow Routing Continuity

	Volume hectare-m	Volume 10 ⁶ ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	9.730	97.301
External Outflow	9.698	96.984
Internal Outflow	0.002	0.018
Storage Losses	0.000	0.000
Initial Stored Volume ...	0.004	0.041
Final Stored Volume	0.031	0.308
Continuity Error (%)	0.032	

Time-Step Critical Elements

Link C1 (99.96%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	1.00 sec
Average Time Step	:	0.84 sec
Maximum Time Step	:	1.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.67

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

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KS1	JUNCTION	0.67	0.80	434.47	0	01:00
KS2	JUNCTION	0.67	0.80	433.17	0	01:00
KS3	JUNCTION	0.67	0.80	432.40	0	01:01
KS4	JUNCTION	0.68	0.82	431.97	0	04:59
KS5	JUNCTION	0.75	0.90	431.64	0	03:21
KS6	JUNCTION	1.02	1.22	431.23	0	01:18
KS7	JUNCTION	1.41	1.69	431.01	0	03:22
J9	JUNCTION	0.67	0.80	433.39	0	01:01
Mündung	OUTFALL	1.73	2.07	430.60	0	01:00

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10 ⁶ ltr	Total Inflow Volume 10 ⁶ ltr
KS1	JUNCTION	4.500	4.500	0 01:00	80.996	97.191
KS2	JUNCTION	0.000	4.500	0 01:00	0.000	97.122
KS3	JUNCTION	0.000	4.500	0 01:01	0.000	97.080
KS4	JUNCTION	0.000	4.500	0 01:02	0.000	97.057
KS5	JUNCTION	0.000	4.500	0 05:02	0.000	97.032
KS6	JUNCTION	0.000	4.500	0 02:27	0.000	97.043
KS7	JUNCTION	0.000	4.500	0 04:50	0.000	97.098
J9	JUNCTION	0.000	4.500	0 01:00	0.000	97.140
Mündung	OUTFALL	0.000	4.500	0 01:27	0.000	97.094

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
KS7	JUNCTION	5.00	0.243	0.177

Node Flooding Summary

No nodes were flooded.

Outfall Loading Summary

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10 ⁶ ltr
Mündung	83.40	4.500	4.500	97.094
System	83.40	4.500	4.500	97.094

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	4.500	0 01:00	4.94	0.62	0.57
C2	CONDUIT	4.500	0 01:01	4.94	0.62	0.57
C3	CONDUIT	4.500	0 01:02	4.94	0.62	0.57

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C4	CONDUIT	4.500	0	05:02	4.70	0.62	0.60
C5	CONDUIT	4.500	0	02:27	3.68	0.62	0.74
C9	CONDUIT	4.500	0	04:50	3.00	0.70	0.94
C10	CONDUIT	4.500	0	01:27	2.92	0.72	1.00
C12	CONDUIT	4.500	0	01:00	4.94	0.62	0.57

 Flow Classification Summary

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---							Avg. Froude Number	Avg. Flow Change
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit		
C1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.62	0.0000
C2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.62	0.0000
C3	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.62	0.0000
C4	1.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	1.50	0.0000
C5	1.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.98	0.0000
C9	1.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.54	0.0000
C10	1.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.0000
C12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.62	0.0000

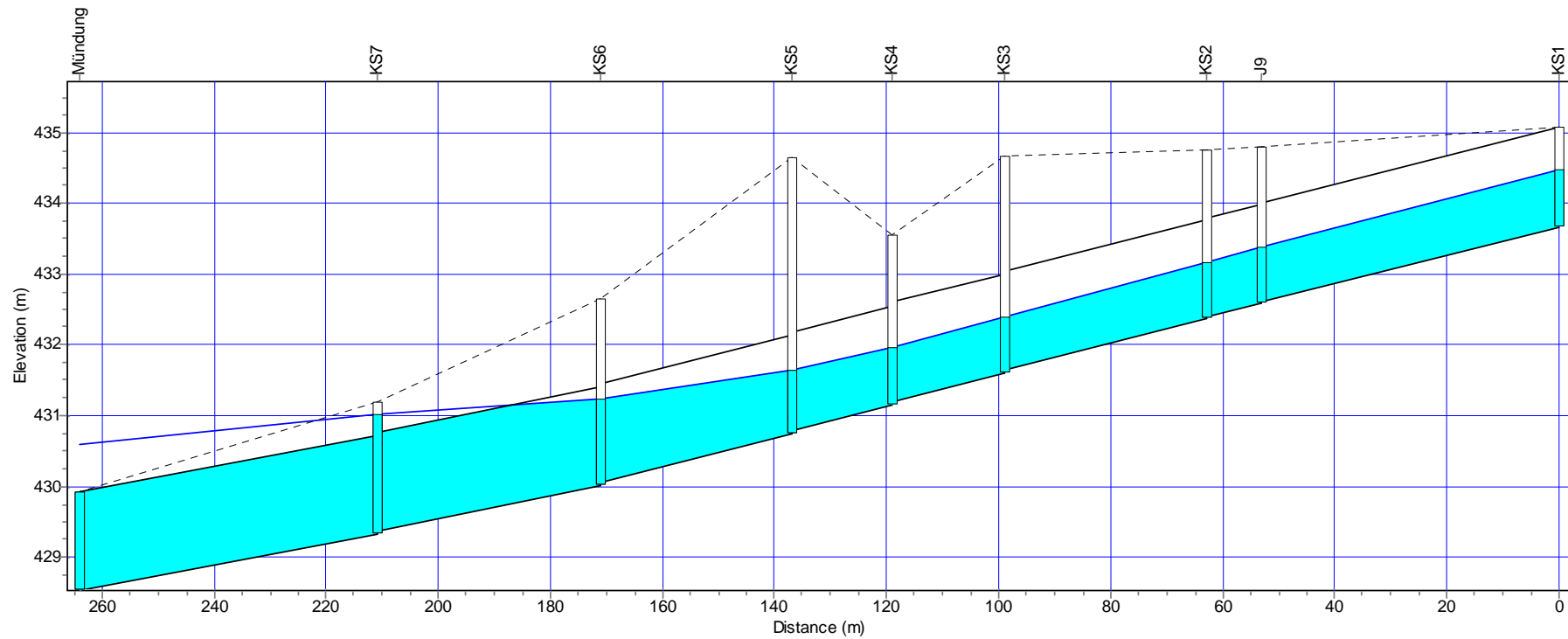
 Conduit Surcharge Summary

Conduit	----- Hours Full -----			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Hours Capacity Limited
C10	5.00	5.00	5.00	0.01	0.01

Analysis begun on: Thu Jul 11 14:54:33 2019
 Analysis ended on: Thu Jul 11 14:54:33 2019
 Total elapsed time: < 1 sec

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Water Elevation Profile: Node KS1 - Mündung



03/17/2015 00:45:00

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Analysis Options

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Process Models:

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 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Flow Routing Method DYNWAVE
 Starting Date MAR-17-2015 00:00:00
 Ending Date MAR-17-2015 06:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:15:00
 Routing Time Step 30.00 sec

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WARNING 03: negative offset ignored for Link C12

Element Count

Number of rain gages 0
 Number of subcatchments ... 0
 Number of nodes 9
 Number of links 8
 Number of pollutants 0
 Number of land uses 0

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
KS1	JUNCTION	433.67	1.40	0.0	Yes
KS2	JUNCTION	432.37	2.38	0.0	
KS3	JUNCTION	431.60	3.07	0.0	
KS4	JUNCTION	431.15	2.40	0.0	
KS5	JUNCTION	430.74	3.91	0.0	
KS6	JUNCTION	430.01	2.64	0.0	
KS7	JUNCTION	429.32	1.87	0.0	
J9	JUNCTION	432.59	2.22	0.0	
Mündung	OUTFALL	428.53	1.40	0.0	

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Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J9	KS2	CONDUIT	10.0	2.0004	0.0150
C2	KS2	KS3	CONDUIT	36.0	2.0004	0.0150
C3	KS3	KS4	CONDUIT	20.0	2.0004	0.0150
C4	KS4	KS5	CONDUIT	18.0	2.0004	0.0150
C5	KS5	KS6	CONDUIT	34.0	2.0004	0.0150
C9	KS6	KS7	CONDUIT	40.0	1.6002	0.0150
C10	KS7	Mündung	CONDUIT	53.0	1.4907	0.0150
C12	KS1	J9	CONDUIT	53.0	2.0004	0.0150

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C2	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C3	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C4	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C5	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21
C9	CIRCULAR	1.40	1.54	0.35	1.40	1	6.45
C10	CIRCULAR	1.40	1.54	0.35	1.40	1	6.22
C12	CIRCULAR	1.40	1.54	0.35	1.40	1	7.21

Flow Routing Continuity

	Volume hectare-m	Volume 10 ⁶ ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	15.131	151.313
External Outflow	15.160	151.599
Internal Outflow	0.007	0.072
Storage Losses	0.000	0.000
Initial Stored Volume ...	0.004	0.041
Final Stored Volume	0.041	0.406
Continuity Error (%)	-0.478	

Time-Step Critical Elements

Link C1 (2.52%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	30.00 sec
Average Time Step	:	23.88 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.59

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

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KS1	JUNCTION	1.52	1.93	435.60	0	01:00
KS2	JUNCTION	1.61	2.04	434.41	0	01:00
KS3	JUNCTION	1.68	2.13	433.73	0	01:00
KS4	JUNCTION	1.74	2.20	433.35	0	01:00
KS5	JUNCTION	1.80	2.27	433.01	0	01:00
KS6	JUNCTION	1.87	2.36	432.37	0	01:00
KS7	JUNCTION	1.81	2.29	431.61	0	01:00
J9	JUNCTION	1.58	2.01	434.60	0	01:00
Mündung	OUTFALL	1.65	2.07	430.60	0	01:00

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10 ⁶ ltr	Total Inflow Volume 10 ⁶ ltr
KS1	JUNCTION	7.000	7.000	0 01:00	126.197	151.231
KS2	JUNCTION	0.000	7.007	0 01:00	0.000	151.352
KS3	JUNCTION	0.000	7.014	0 01:00	0.000	151.431
KS4	JUNCTION	0.000	7.017	0 01:00	0.000	151.509
KS5	JUNCTION	0.000	7.021	0 01:00	0.000	151.584
KS6	JUNCTION	0.000	7.024	0 01:00	0.000	151.560
KS7	JUNCTION	0.000	7.026	0 01:00	0.000	151.610
J9	JUNCTION	0.000	7.002	0 01:00	0.000	151.256
Mündung	OUTFALL	0.000	7.026	0 01:00	0.000	151.680

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
KS1	JUNCTION	5.01	0.532	0.000
KS2	JUNCTION	5.01	0.624	0.336
KS3	JUNCTION	5.01	0.682	0.938
KS4	JUNCTION	5.01	0.753	0.197
KS5	JUNCTION	5.01	0.822	1.638
KS6	JUNCTION	5.01	0.906	0.284
KS7	JUNCTION	5.01	0.837	0.000
J9	JUNCTION	5.01	0.593	0.207

Node Flooding Summary

No nodes were flooded.

Outfall Loading Summary

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10 ⁶ ltr
Mündung	79.60	7.002	7.026	151.680
System	79.60	7.002	7.026	151.680

Link Flow Summary

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Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	7.007	0 01:00	4.55	0.97	1.00
C2	CONDUIT	7.014	0 01:00	4.56	0.97	1.00
C3	CONDUIT	7.017	0 01:00	4.56	0.97	1.00
C4	CONDUIT	7.021	0 01:00	4.56	0.97	1.00
C5	CONDUIT	7.024	0 01:00	4.56	0.97	1.00
C9	CONDUIT	7.026	0 01:00	4.56	1.09	1.00
C10	CONDUIT	7.026	0 01:00	4.56	1.13	1.00
C12	CONDUIT	7.002	0 01:00	4.55	0.97	1.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---							Avg. Froude Number	Avg. Flow Change
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit		
C1	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C2	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C3	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C4	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C5	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C9	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C10	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000
C12	1.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.0000

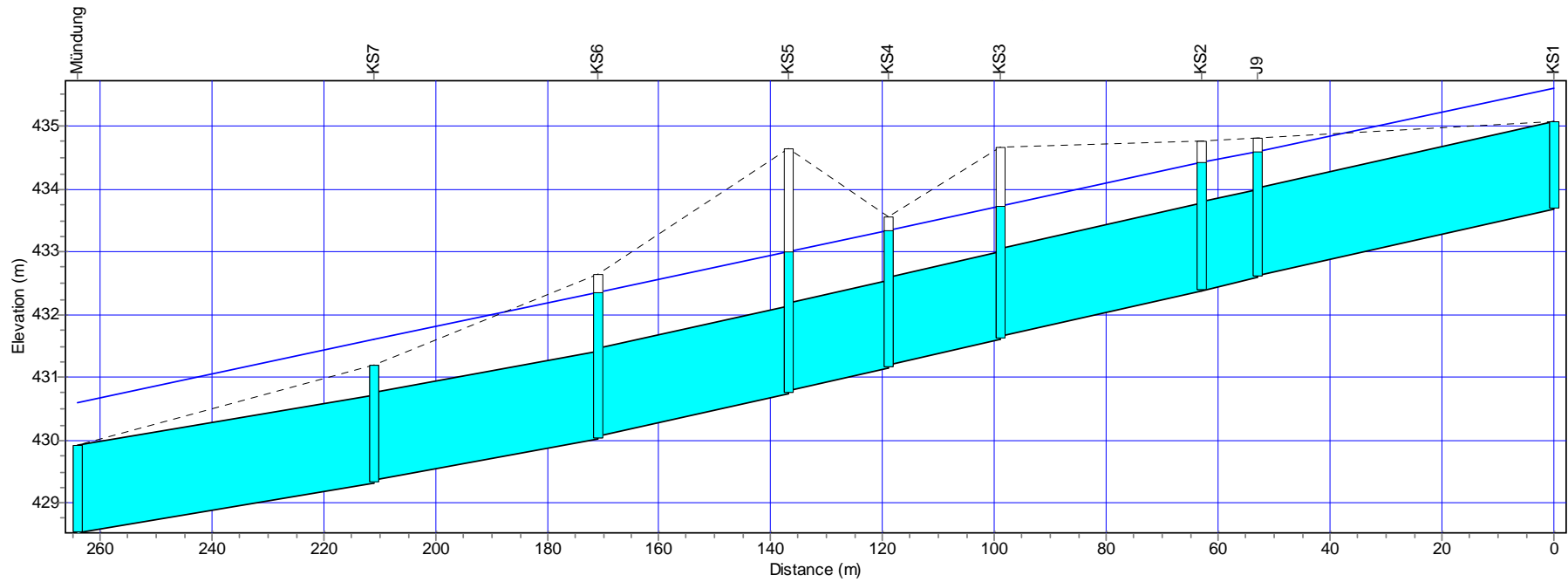
Conduit Surcharge Summary

Conduit	----- Hours Full -----			Hours Above Full	
	Both Ends	Upstream	Dnstream	Normal Flow	Capacity Limited
C1	5.01	5.01	5.01	0.01	0.01
C2	5.01	5.01	5.01	0.01	0.01
C3	5.01	5.01	5.01	0.01	0.01
C4	5.01	5.01	5.01	0.01	0.01
C5	5.01	5.01	5.01	0.01	0.01
C9	5.01	5.01	5.01	5.01	5.01
C10	5.01	5.01	5.01	5.01	5.01
C12	5.01	5.01	5.01	0.01	0.01

Analysis begun on: Thu Jul 11 15:11:46 2019
 Analysis ended on: Thu Jul 11 15:11:46 2019
 Total elapsed time: < 1 sec

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Water Elevation Profile: Node KS1 - Mündung



03/17/2015 00:45:00