



**Civil Engineer**  
**Stormwater Best Management Practice (permanent) Certification Letter**

April 17, 2026

El Paso County  
Planning and Community Development  
2880 International Circle, Suite 110  
Colorado Springs, CO 80910

Attn.: Brad Walters, Inspections Supervisor

RE: **Retreat at TimberRidge Filing No. 4**

The permanent stormwater Best Management Practices (BMPs) for the **Retreat at TimberRidge Filing No. 4** consists of a Private Full Spectrum Extended Detention Basin. This facility is described by the following:

Pond 4 within Tract A, Retreat at TimberRidge Filing No. 4

The site and adjacent properties (as affected by work performed under the County permit) appear to be stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover and the improvements (public improvements, common development improvements, site grading and paving) meet or exceed the minimum design requirements. The detention/stormwater quality facility provides the required storage volume and will meet the required release rates (as documented by the attached UDFCD design form submitted with the original application), the stage areas, elevations and outlet dimensions.

**Statement Of Engineer In Responsible Charge:**

I, Marc A. Whorton, a registered Professional Engineer in the State of Colorado, in accordance with Sections 5.2 and 5.3 of the Bylaws and Rules of the State Board of Registration for Professional Engineers and Professional Land Surveyors, do hereby certify that I or a person under my responsible charge periodically observed the construction of the above-mentioned project. Based on the on-site

field observations and review of pertinent as-built documentation, it is my professional opinion that the required permanent BMP has been installed and is in general compliance with the approved Construction Plans, and Specifications as filed with El Paso County. For BMPs with a Water Quality Capture Volume (WQCV), I have attached the post-construction As-Built drawings and calculations. The As-Built drawings accurately depict the final installation of the stormwater BMP.



Marc A. Whorton, P.E.  
Colorado No. 37155



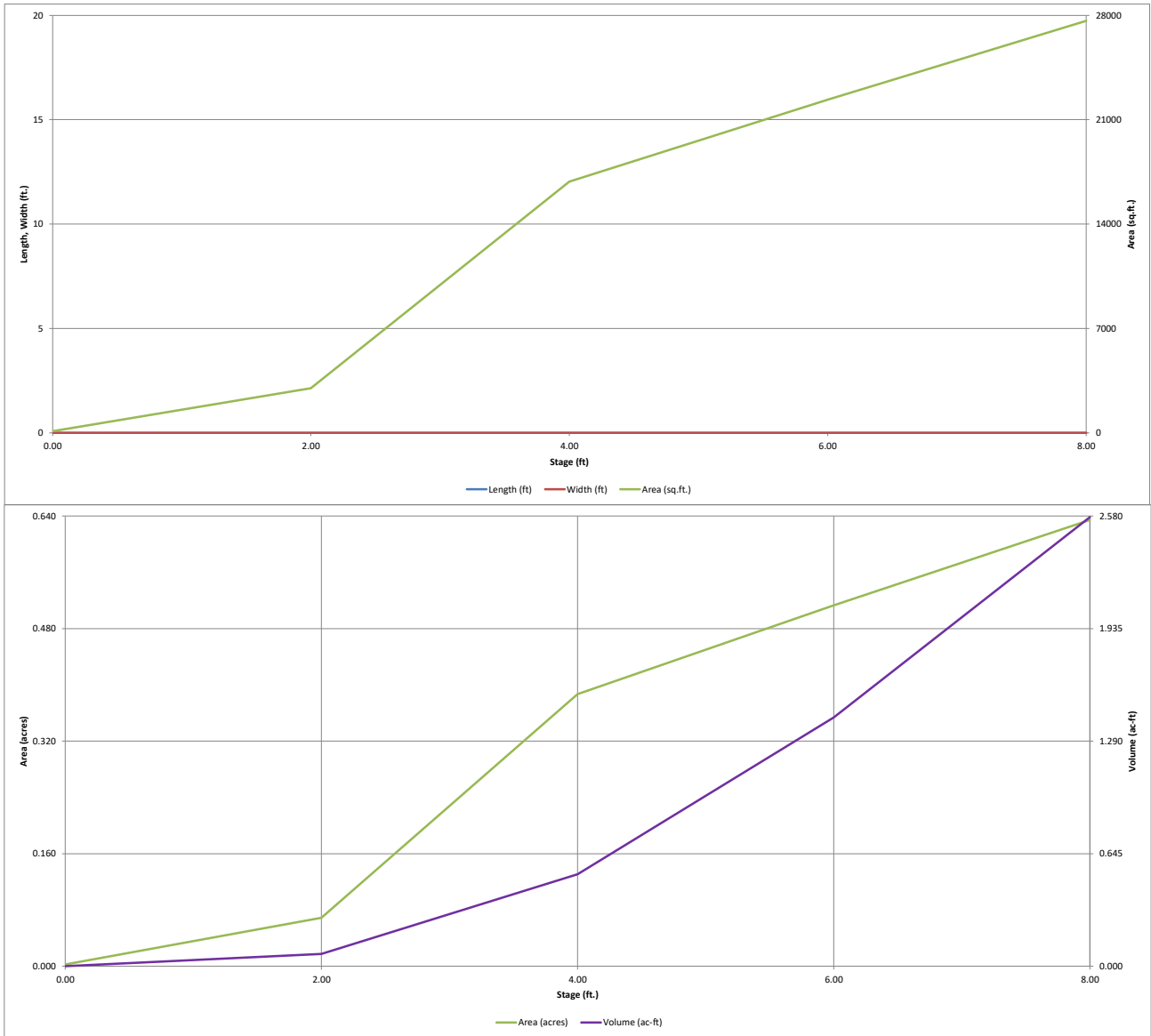
4/17/2026

Seal & Signature of P.E. Goes Here



# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

*MHFD-Detention, Version 4.06 (July 2022)*

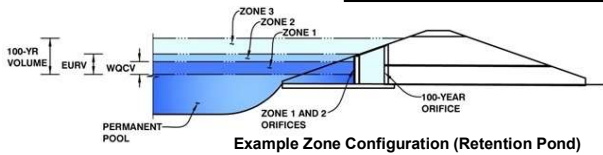


# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

**Project: RETREAT AT TIMBERIDGE FILING NO. 4**

**Basin ID: POND 4 - AS-BUILT**



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.92	0.201	Orifice Plate
Zone 2 (EURV)	3.38	0.114	Orifice Plate
Zone 3 (100-year)	6.21	1.216	Weir&Pipe (Restrict)
<b>Total (all zones)</b>		<b>1.531</b>	

**User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)**

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Underdrain Orifice Area =	N/A	ft <sup>2</sup>
Underdrain Orifice Centroid =	N/A	feet

**User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)**

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	3.50	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	14.00	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

WQ Orifice Area per Row =	N/A	ft <sup>2</sup>
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft <sup>2</sup>

**User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)**

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.20	2.40					
Orifice Area (sq. inches)	0.79	0.89	0.89					
	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

**User Input: Vertical Orifice (Circular or Rectangular)**

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft <sup>2</sup>
Vertical Orifice Centroid =	N/A	N/A	feet

**User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)**

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	9.00	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Type =	Close Mesh Grate	N/A	
Debris Clogging % =	50%	N/A	%

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H <sub>u</sub> =	4.50	N/A	feet
Overflow Weir Slope Length =	4.12	N/A	feet
Grate Open Area / 100-yr Orifice Area =	6.86	N/A	
Overflow Grate Open Area w/o Debris =	29.35	N/A	ft <sup>2</sup>
Overflow Grate Open Area w/ Debris =	14.68	N/A	ft <sup>2</sup>

**User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)**

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	3.10	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	36.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	21.00		inches

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	4.28	N/A	ft <sup>2</sup>
Outlet Orifice Centroid =	1.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.74	N/A	radians

**User Input: Emergency Spillway (Rectangular or Trapezoidal)**

Spillway Invert Stage =	6.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	18.00	feet
Spillway End Slopes =	3.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Spillway Design Flow Depth =	0.98	feet
Stage at Top of Freeboard =	7.98	feet
Basin Area at Top of Freeboard =	0.63	acres
Basin Volume at Top of Freeboard =	2.53	acre-ft

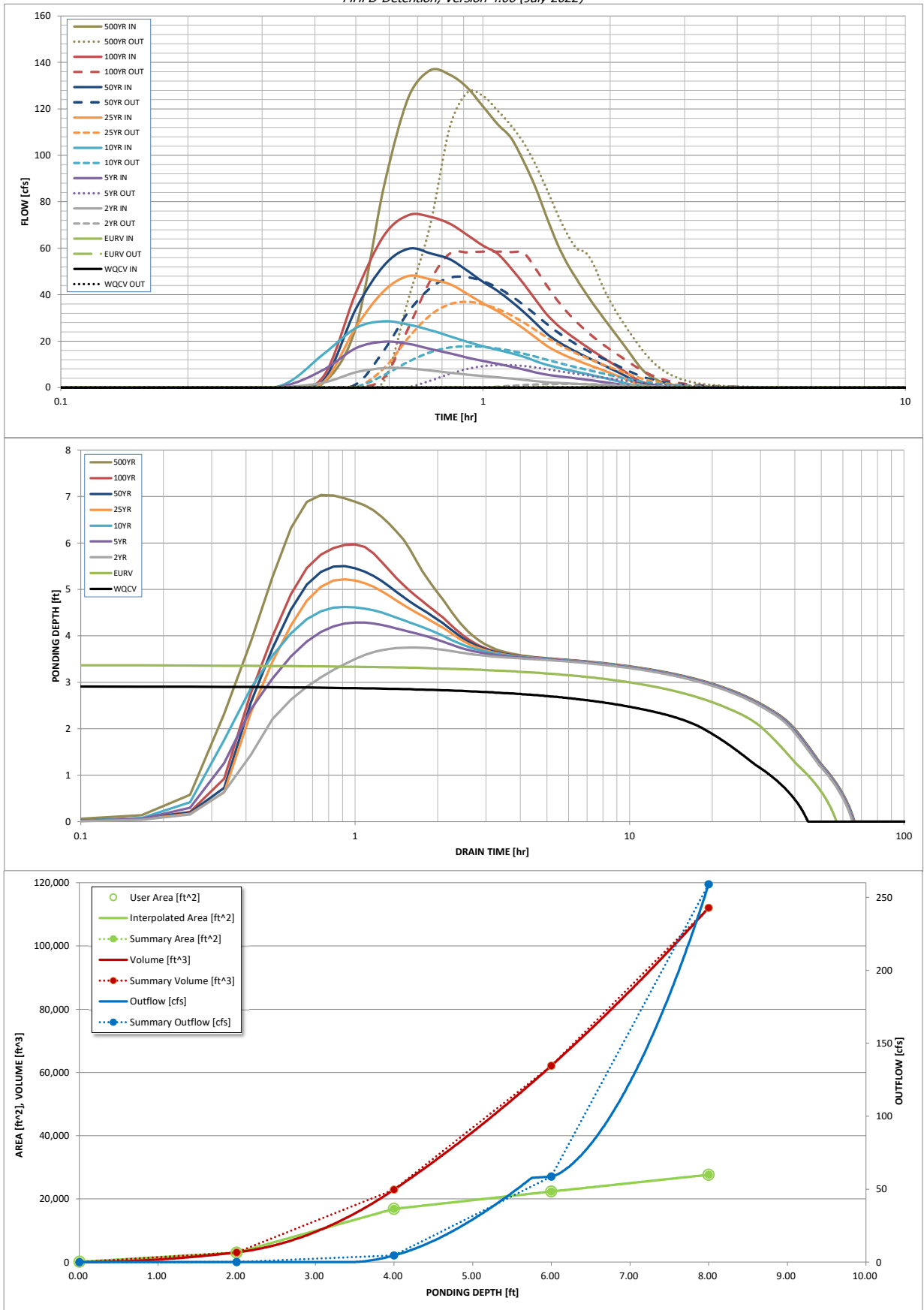
## Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.85
One-Hour Rainfall Depth (in) =	0.201	0.315	0.541	1.291	2.054	3.459	4.396	5.766	11.146
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.541	1.291	2.054	3.459	4.396	5.766	11.146
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	6.1	17.2	26.0	45.5	57.2	71.6	133.9
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.13	0.23	0.54	0.94	1.18	1.42	2.76
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A	8.4	19.7	28.6	48.0	59.8	74.3	136.6
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	1.6	9.7	17.8	36.9	47.6	58.6	126.9
Peak Inflow Q (cfs) =	N/A	N/A	N/A	0.9	0.7	0.8	0.8	0.8	0.9
Peak Outflow Q (cfs) =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	0.05	0.3	0.6	1.3	1.6	2.0	2.1
Structure Controlling Flow =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 1 (fps) =	39	49	54	46	41	34	30	25	7
Max Velocity through Grate 2 (fps) =	42	53	60	56	53	48	45	42	33
Time to Drain 97% of Inflow Volume (hours) =	2.92	3.38	3.75	4.29	4.63	5.22	5.50	5.97	7.03
Time to Drain 99% of Inflow Volume (hours) =	0.22	0.29	0.35	0.40	0.43	0.46	0.48	0.51	0.58
Maximum Ponding Depth (ft) =	0.202	0.317	0.431	0.638	0.779	1.046	1.178	1.406	1.987
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

# DETENTION BASIN OUTLET STRUCTURE DESIGN

*MHFD-Detention, Version 4.06 (July 2022)*



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

# DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: \_\_\_\_\_

## Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0:15:00	0.00	0.00	0.04	0.07	0.09	0.06	0.07	0.07	0.15
	0:20:00	0.00	0.00	0.17	0.53	0.98	0.17	0.20	0.24	1.71
	0:25:00	0.00	0.00	2.06	7.44	14.04	1.94	2.56	4.22	25.79
	0:30:00	0.00	0.00	6.58	16.97	25.62	25.93	33.77	40.74	86.94
	0:35:00	0.00	0.00	8.37	19.75	28.59	41.71	52.67	65.59	125.12
	0:40:00	0.00	0.00	8.29	18.84	27.07	48.05	59.82	74.25	136.60
	0:45:00	0.00	0.00	7.31	16.64	24.77	46.61	57.77	73.56	134.74
	0:50:00	0.00	0.00	6.42	14.79	22.16	44.63	55.37	70.63	129.26
	0:55:00	0.00	0.00	5.61	12.95	19.72	40.44	50.43	65.81	121.03
	1:00:00	0.00	0.00	4.96	11.45	17.83	36.26	45.54	61.13	113.40
	1:05:00	0.00	0.00	4.45	10.21	16.28	32.85	41.60	57.59	107.42
	1:10:00	0.00	0.00	3.90	9.03	14.78	29.09	37.10	51.34	97.17
	1:15:00	0.00	0.00	3.34	7.81	13.29	25.30	32.53	44.54	85.98
	1:20:00	0.00	0.00	2.79	6.56	11.38	21.53	27.76	37.75	73.33
	1:25:00	0.00	0.00	2.32	5.59	9.83	17.98	23.21	31.53	61.97
	1:30:00	0.00	0.00	2.04	4.99	8.67	15.42	19.99	27.03	53.40
	1:35:00	0.00	0.00	1.82	4.49	7.68	13.43	17.44	23.54	46.62
	1:40:00	0.00	0.00	1.63	3.97	6.79	11.77	15.30	20.57	40.76
	1:45:00	0.00	0.00	1.43	3.46	5.96	10.27	13.37	17.91	35.51
	1:50:00	0.00	0.00	1.24	2.96	5.17	8.91	11.62	15.46	30.69
	1:55:00	0.00	0.00	1.05	2.48	4.37	7.61	9.94	13.16	26.16
	2:00:00	0.00	0.00	0.85	2.00	3.56	6.35	8.32	11.01	21.92
	2:05:00	0.00	0.00	0.66	1.52	2.75	5.11	6.72	8.96	17.78
	2:10:00	0.00	0.00	0.46	1.05	1.97	3.88	5.13	6.91	13.69
	2:15:00	0.00	0.00	0.28	0.62	1.29	2.66	3.56	4.90	9.83
	2:20:00	0.00	0.00	0.14	0.35	0.89	1.58	2.19	3.11	6.70
	2:25:00	0.00	0.00	0.09	0.25	0.68	0.98	1.43	2.05	4.71
	2:30:00	0.00	0.00	0.07	0.19	0.53	0.62	0.96	1.37	3.34
	2:35:00	0.00	0.00	0.05	0.15	0.41	0.40	0.64	0.89	2.32
	2:40:00	0.00	0.00	0.04	0.11	0.31	0.25	0.42	0.55	1.56
	2:45:00	0.00	0.00	0.03	0.09	0.23	0.16	0.28	0.32	1.00
	2:50:00	0.00	0.00	0.02	0.06	0.17	0.10	0.18	0.16	0.60
	2:55:00	0.00	0.00	0.02	0.05	0.12	0.06	0.12	0.08	0.35
	3:00:00	0.00	0.00	0.01	0.03	0.08	0.04	0.08	0.06	0.24
	3:05:00	0.00	0.00	0.01	0.02	0.05	0.03	0.06	0.04	0.17
	3:10:00	0.00	0.00	0.01	0.02	0.04	0.02	0.05	0.04	0.14
	3:15:00	0.00	0.00	0.01	0.01	0.03	0.02	0.03	0.03	0.11
	3:20:00	0.00	0.00	0.00	0.01	0.02	0.01	0.03	0.02	0.08
	3:25:00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.06
	3:30:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.04
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

