El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond C1
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'15.97"N, Longitude: 104°37'13.09"W

Assessor's Parcel #: 5500000278 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2018

Project acreage: 275 acres Design Ponding Acres: 1.80 acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond C1 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs . The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond C1 - fully developed conditions with full spectrum outlet**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.040	ft/ft
Watershed Length =	2400	ft
Watershed Area =	57.70	acres
Watershed Imperviousness =	65.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =		percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

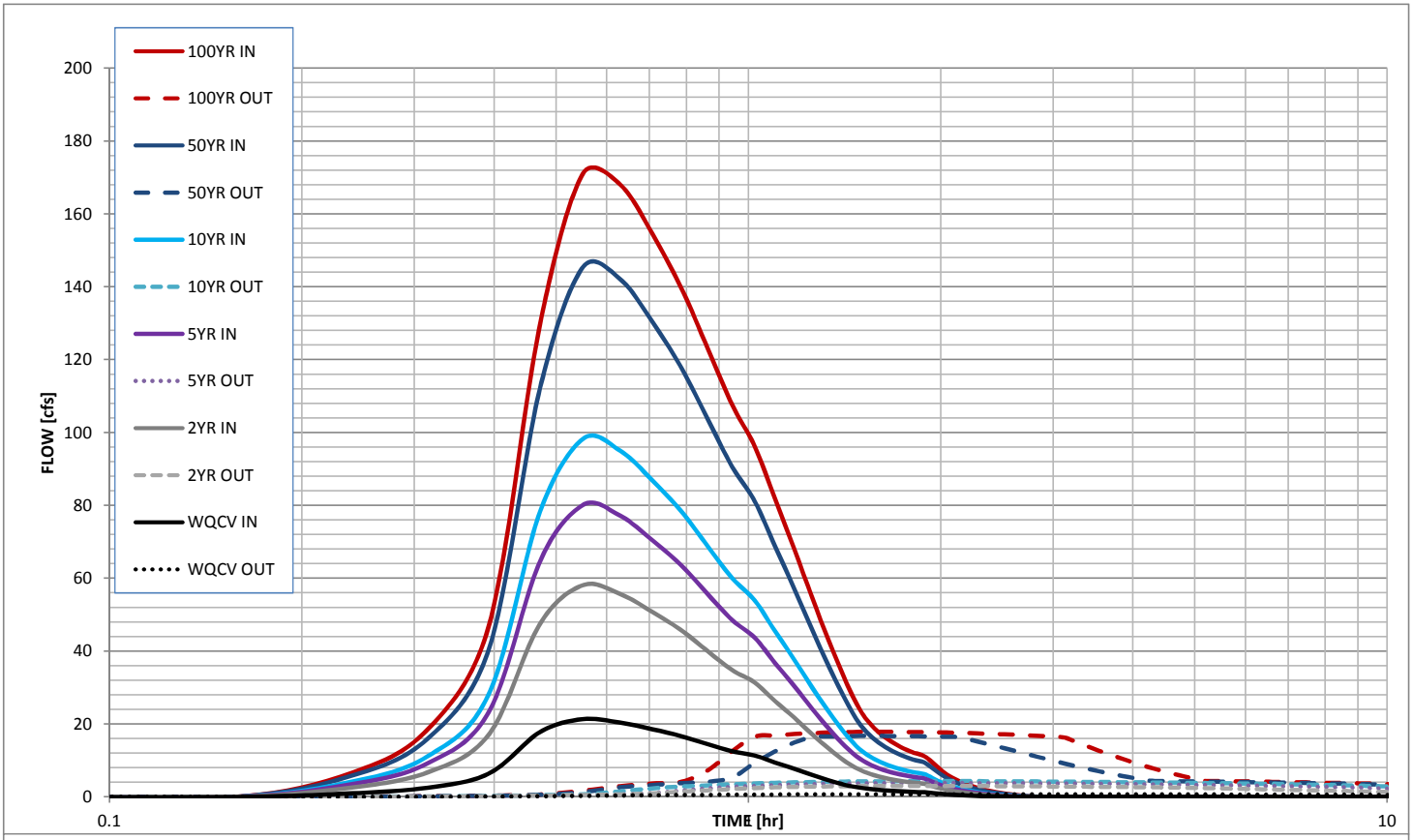
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	4,020	0.00	0.00
0.33	10,492	0.33	0.14
1.00	23,632	1.00	0.35
2.00	53,900	2.00	0.77
3.00	57,925	3.00	2.61
4.00	62,019	4.00	3.63
5.00	66,200	5.00	4.40
6.00	70,500	6.00	16.44
7.00	74,920	7.00	17.91
8.00	78,760	8.00	19.26
9.00	80,000	9.00	20.53
10.00	82,000	10.00	21.72
11.00	84,000	11.00	22.86

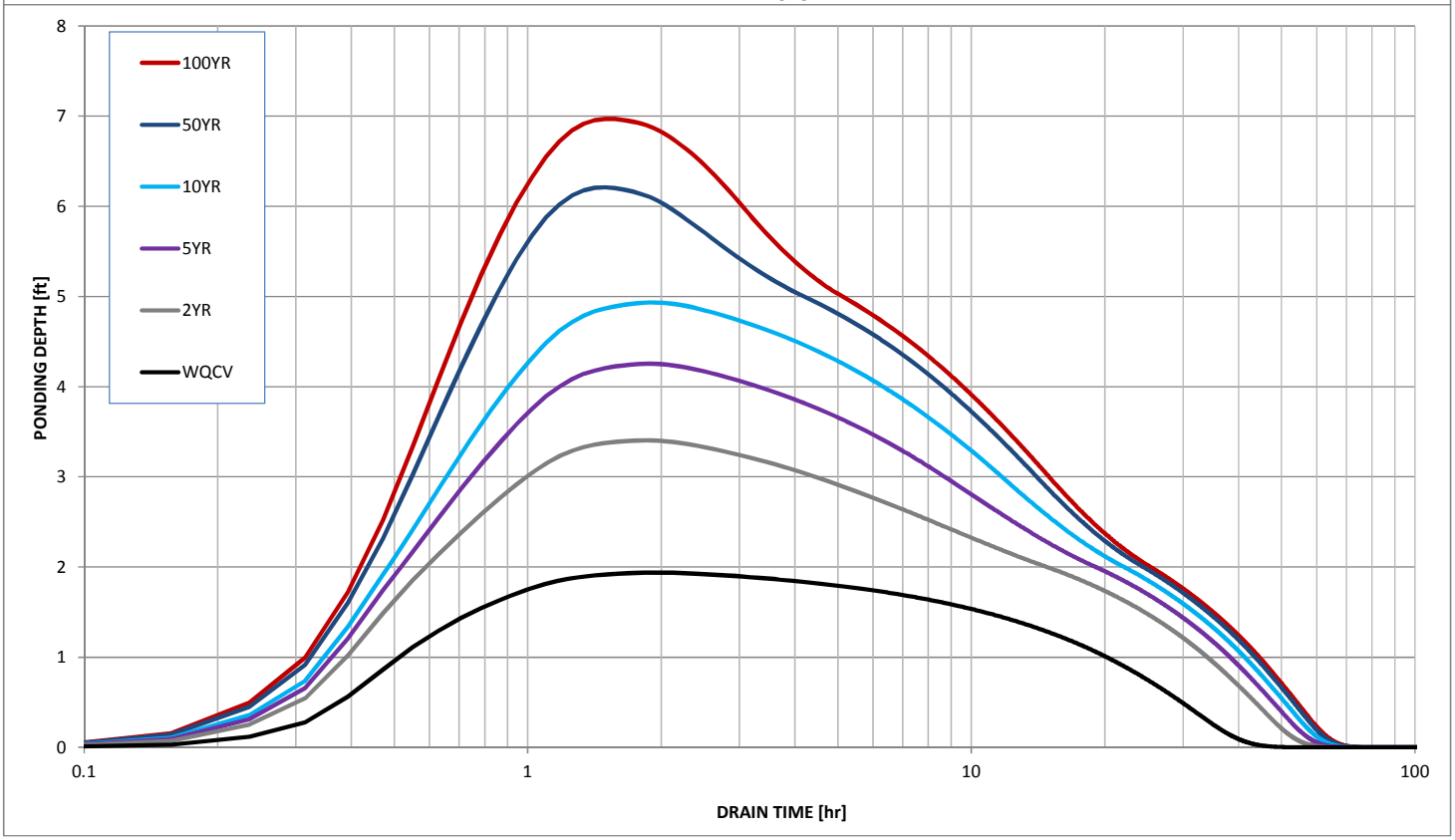
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	1.222	3.370	4.678	5.763	8.625	10.193	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	1.222	3.370	4.677	5.762	8.617	10.188	acre-ft
Time to Drain 97% of Inflow Volume =	35.2	43.7	**45.7**	47.0	45.7	44.9	hours
Time to Drain 99% of Inflow Volume =	39.5	49.4	52.2	54.2	54.3	**54.2**	hours
Maximum Ponding Depth =	1.94	3.40	4.25	4.93	6.21	6.97	ft
Maximum Ponded Area =	1.19	1.37	1.45	1.51	1.64	**1.72**	acres
Maximum Volume Stored =	1.120	3.020	4.221	5.221	7.232	8.507	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond C2.2
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'21.69"N, Longitude: 104°37'06.67"W

Assessor's Parcel #: 5500000405 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2019

Project acreage: 275 acres Design Ponding Acres: 0.91 acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond C2.2 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs . The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond C2.2 - fully developed conditions with full spectrum outlet**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.045	ft/ft
Watershed Length =	2500	ft
Watershed Area =	40.00	acres
Watershed Imperviousness =	65.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =		percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

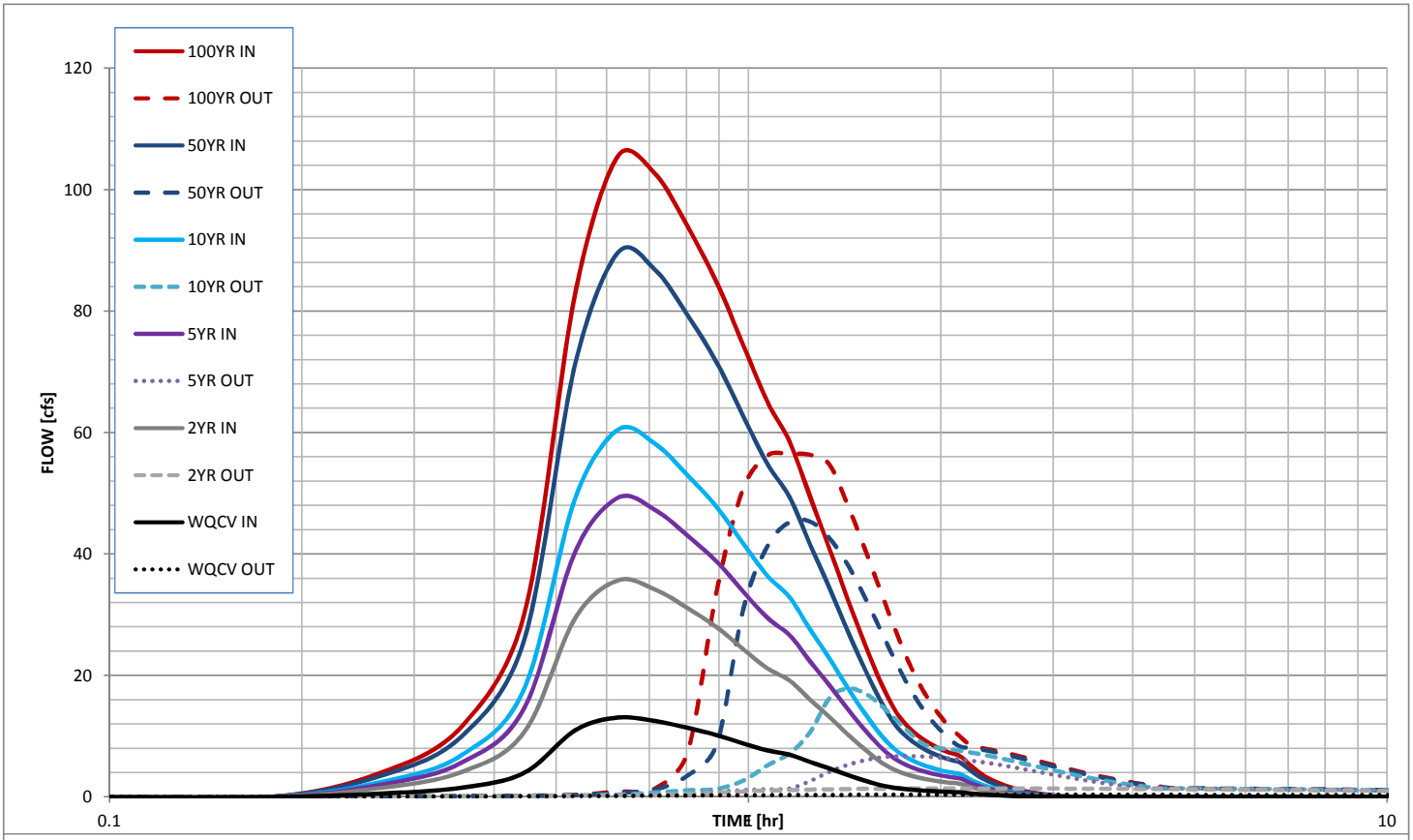
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	30	0.00	0.00
0.33	200	0.33	0.05
1.00	2,363	1.00	0.10
2.00	23,792	2.00	0.23
3.00	25,787	3.00	0.40
4.00	27,855	4.00	1.05
5.00	29,992	5.00	1.42
6.00	32,230	6.00	8.30
7.00	34,712	7.00	56.00
8.00	37,000	8.00	61.00
9.00	40,000	9.00	65.00
10.00	53,000	10.00	170.00
11.00	56,000	11.00	355.00

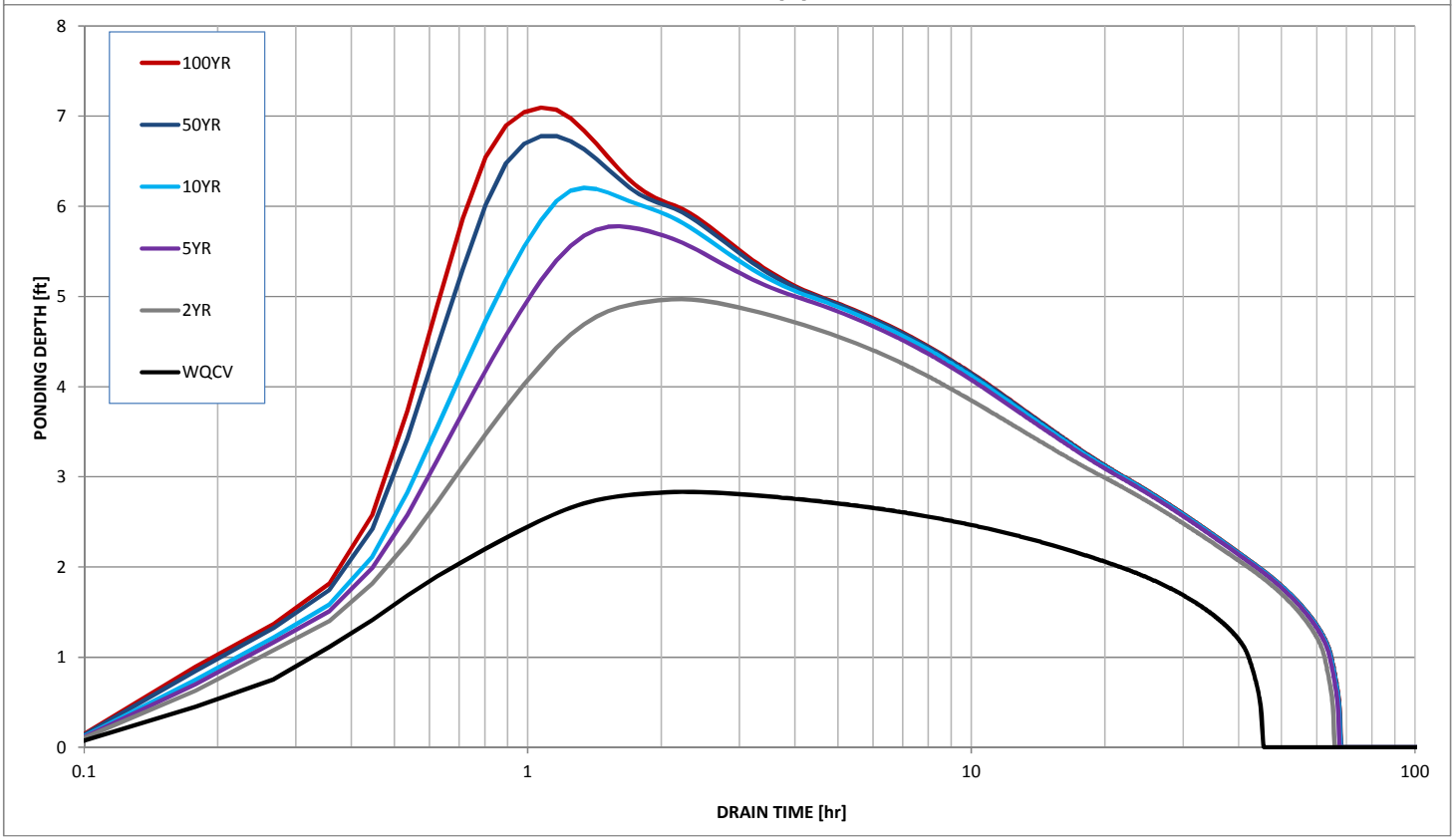
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	0.847	2.336	3.243	3.995	5.979	7.066	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.846	2.336	3.242	3.994	5.972	7.061	acre-ft
Time to Drain 97% of Inflow Volume =	41.6	57.7	**57.3**	56.0	52.1	50.2	hours
Time to Drain 99% of Inflow Volume =	43.8	62.2	62.9	62.5	60.9	**60.0**	hours
Maximum Ponding Depth =	2.83	4.97	5.78	6.21	6.78	7.09	ft
Maximum Ponded Area =	0.58	0.69	0.73	0.75	0.78	**0.80**	acres
Maximum Volume Stored =	0.783	2.141	2.712	3.031	3.471	3.716	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond C2.3
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'15.97"N, Longitude: 104°37'13.09"W

Assessor's Parcel #: 5500000287 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2019

Project acreage: 275 acres Design Ponding Acres: 0.84 acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond C2.3 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs . The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond C2.3 - fully developed conditions with full spectrum outlet**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.050	ft/ft
Watershed Length =	905	ft
Watershed Area =	18.70	acres
Watershed Imperviousness =	65.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =		percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

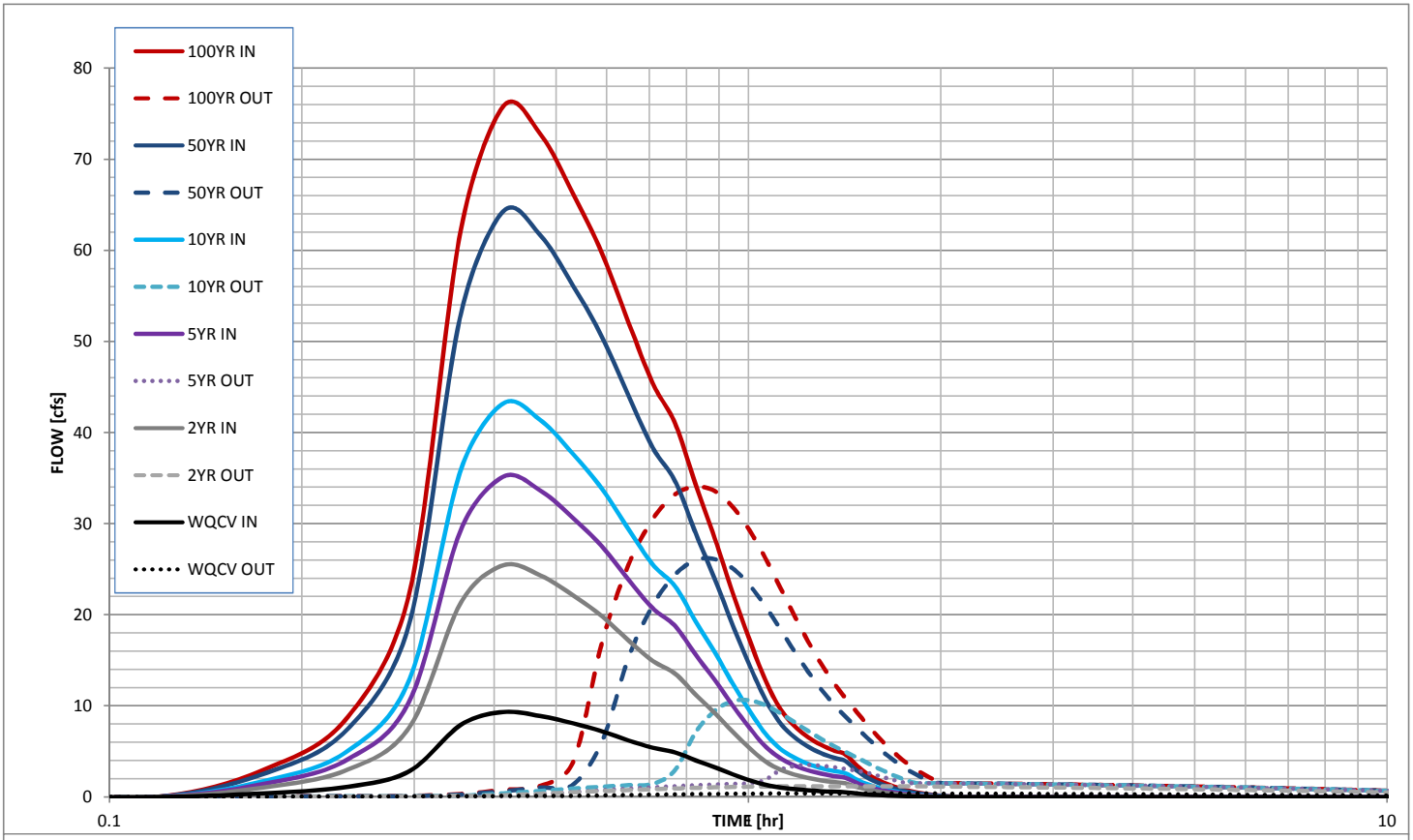
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	30	0.00	0.00
0.33	500	0.33	0.05
1.00	22,141	1.00	0.13
2.00	24,321	2.00	0.85
3.00	26,601	3.00	1.54
4.00	28,983	4.00	34.00
5.00	31,466	5.00	43.00
6.00	34,050	6.00	50.00
7.00	36,742	7.00	56.00
8.00	38,000	8.00	127.00

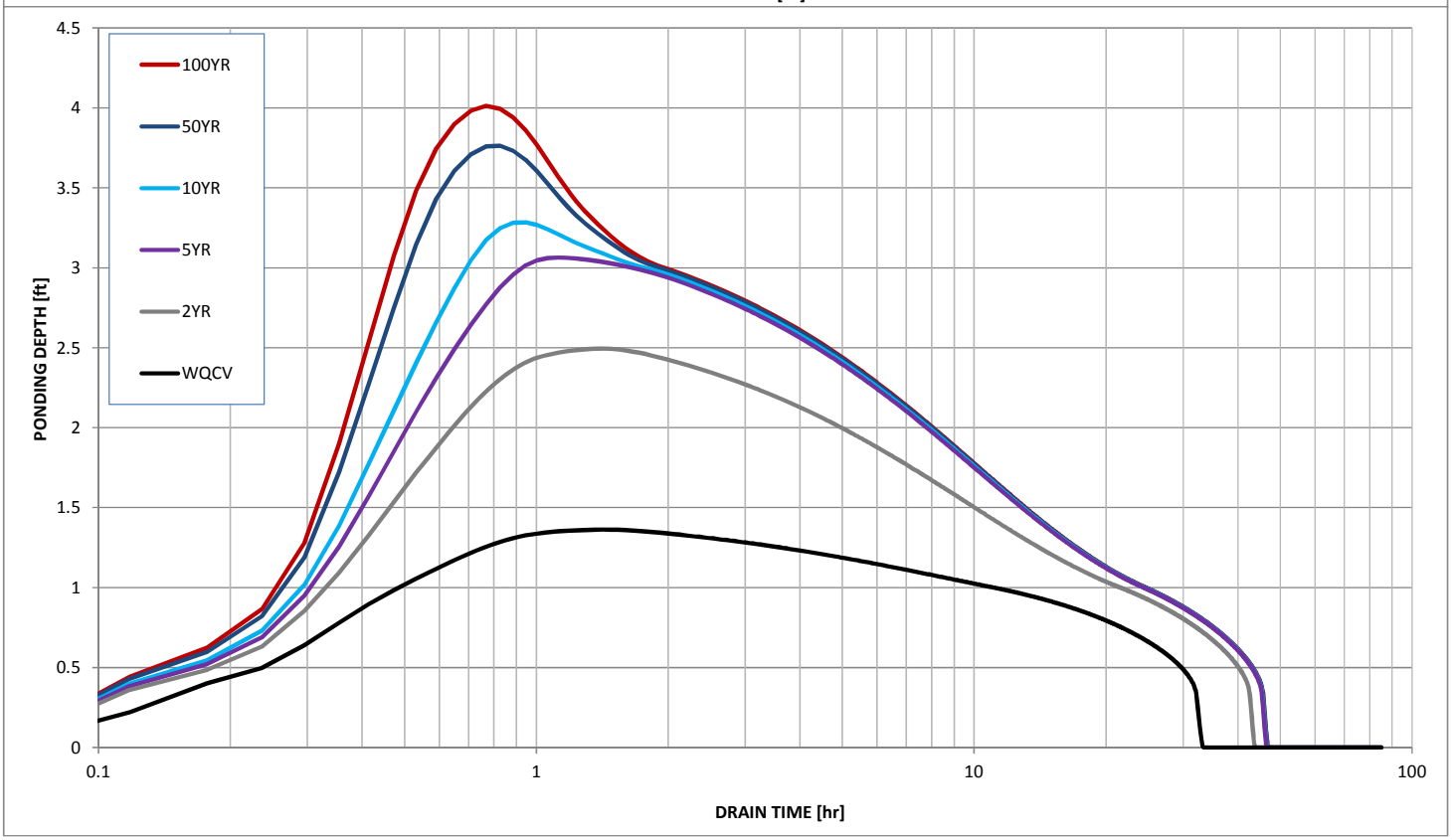
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	0.396	1.092	1.516	1.868	2.795	3.304	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.396	1.092	1.516	1.867	2.794	3.303	acre-ft
Time to Drain 97% of Inflow Volume =	30.2	37.2	**38.3**	37.0	33.7	32.1	hours
Time to Drain 99% of Inflow Volume =	31.7	40.8	42.8	42.3	41.0	**40.3**	hours
Maximum Ponding Depth =	1.36	2.49	3.06	3.28	3.76	4.01	ft
Maximum Ponded Area =	0.53	0.58	0.61	0.63	0.65	**0.67**	acres
Maximum Volume Stored =	0.359	0.988	1.327	1.467	1.772	1.934	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond C3
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'30.54"N, Longitude: 104°36'55.94"W

Assessor's Parcel #: 5500000274 Section: 13 Township: 15 South Range: 65 West

Expected Completion date: August, 2019

Project acreage: 275 acres Design Ponding Acres: 1.50acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond C3 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs . The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond C3 - fully developed conditions with full spectrum outlet**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.040	ft/ft
Watershed Length =	1250	ft
Watershed Area =	30.00	acres
Watershed Imperviousness =	52.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =	30.0%	percent
Percentage Hydrologic Soil Groups C/D =	70.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

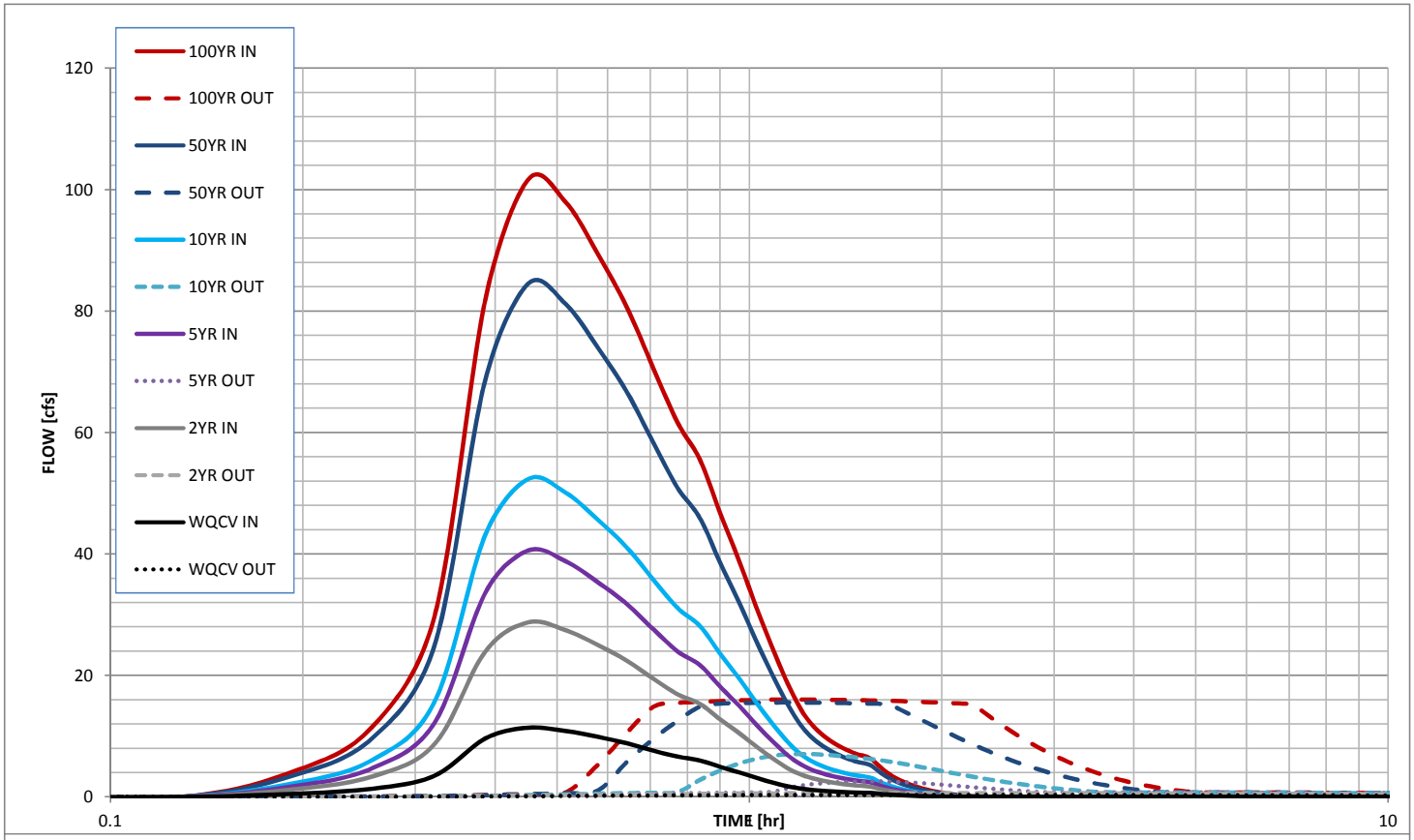
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	262	0.00	0.00
0.33	4,657	0.33	0.06
1.00	13,580	1.00	0.15
2.00	33,254	2.00	0.40
3.00	46,803	3.00	0.76
4.00	50,425	4.00	15.30
5.00	54,123	5.00	16.20
6.00	57,909	6.00	17.00
7.00	61,796	7.00	17.80
8.00	70,319	8.00	85.00

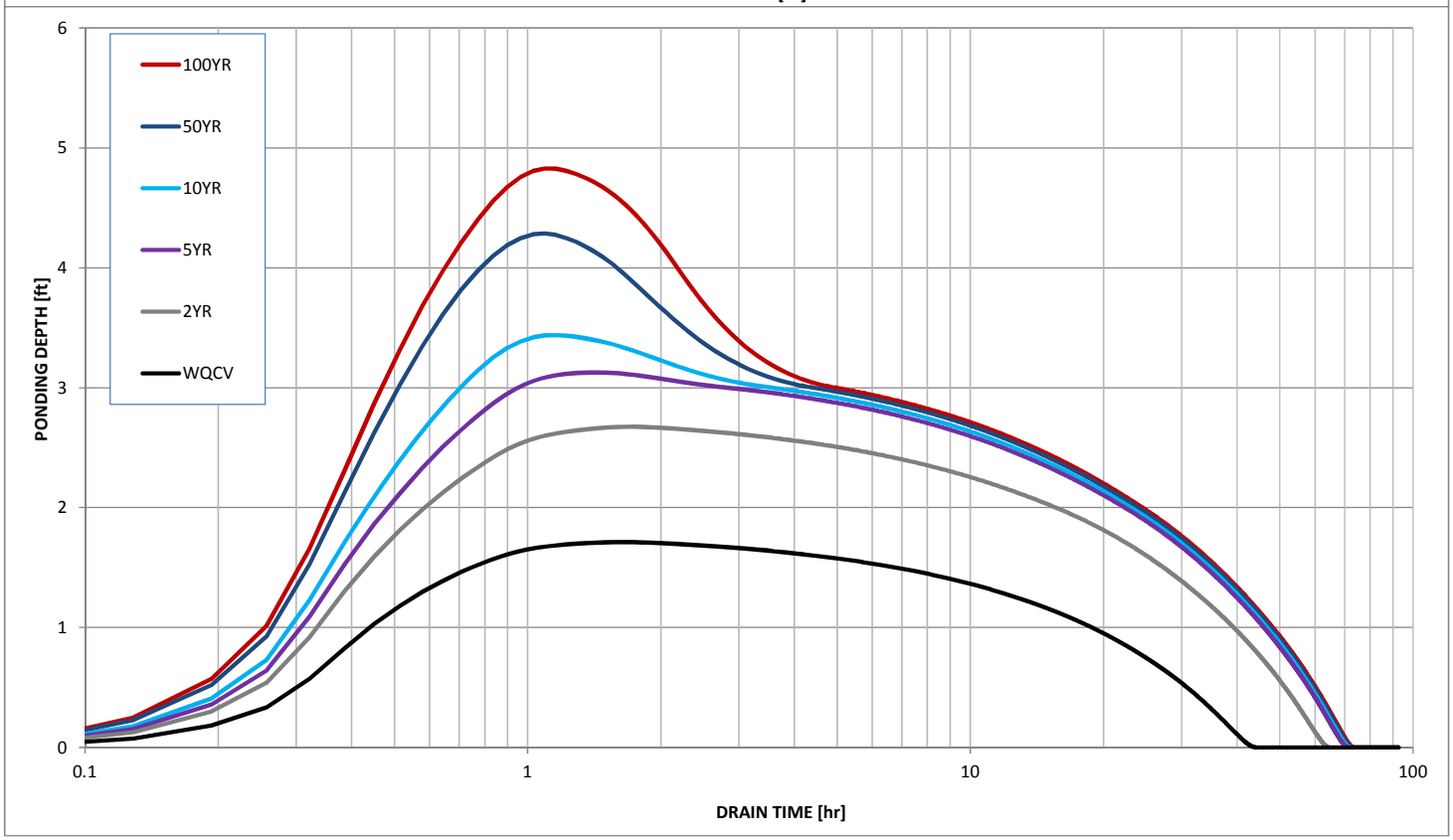
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	0.529	1.349	1.911	2.475	4.024	4.860	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.529	1.348	1.911	2.474	4.024	4.859	acre-ft
Time to Drain 97% of Inflow Volume =	35.4	51.5	**55.8**	54.6	50.8	49.1	hours
Time to Drain 99% of Inflow Volume =	38.7	56.5	61.9	61.6	59.8	**59.2**	hours
Maximum Ponding Depth =	1.71	2.67	3.13	3.44	4.29	4.83	ft
Maximum Ponded Area =	0.63	0.97	1.08	1.11	1.18	**1.23**	acres
Maximum Volume Stored =	0.489	1.272	1.747	2.084	3.061	3.711	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond C5
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'25.73"N, Longitude: 104°37'42.67"W

Assessor's Parcel #: 5500000402 Section: 14 Township: 15 South Range: 65 West

Expected Completion date: August, 2018

Project acreage: 275 acres Design Ponding Acres: 2.9 acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond C5 is an Extended Detention Basin including water quality capture volume for Lorson East Phase 1. The detention pond has been designed in accordance with full spectrum design.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards achieved.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: Pond C5

Facility Location & Jurisdiction: Lorson East, El Paso County, CO

User Input: Watershed Characteristics

Watershed Slope =	0.018	ft/ft
Watershed Length =	3200	ft
Watershed Area =	171.00	acres
Watershed Imperviousness =	63.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =		percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

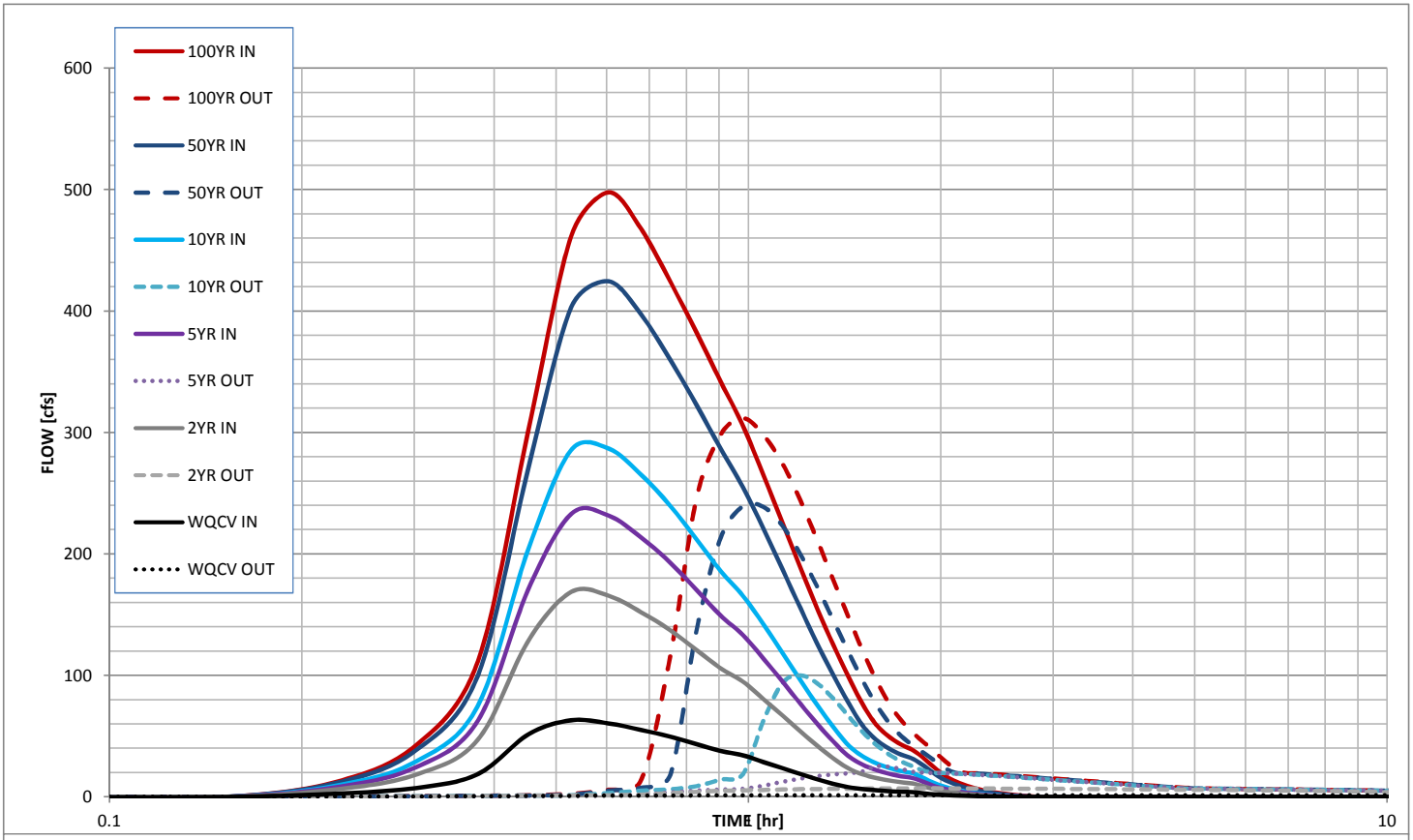
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	50	0.00	0.00
0.33	100	0.33	0.17
1.00	1,000	1.00	0.31
2.00	18,898	2.00	0.68
3.00	77,432	3.00	1.11
4.00	110,270	4.00	1.47
5.00	115,455	5.00	4.97
6.00	120,720	6.00	6.92
7.00	126,045	7.00	20.00
8.00	131,696	8.00	300.00
9.00	136,745	9.00	660.00
10.00	141,857	10.00	1084.00

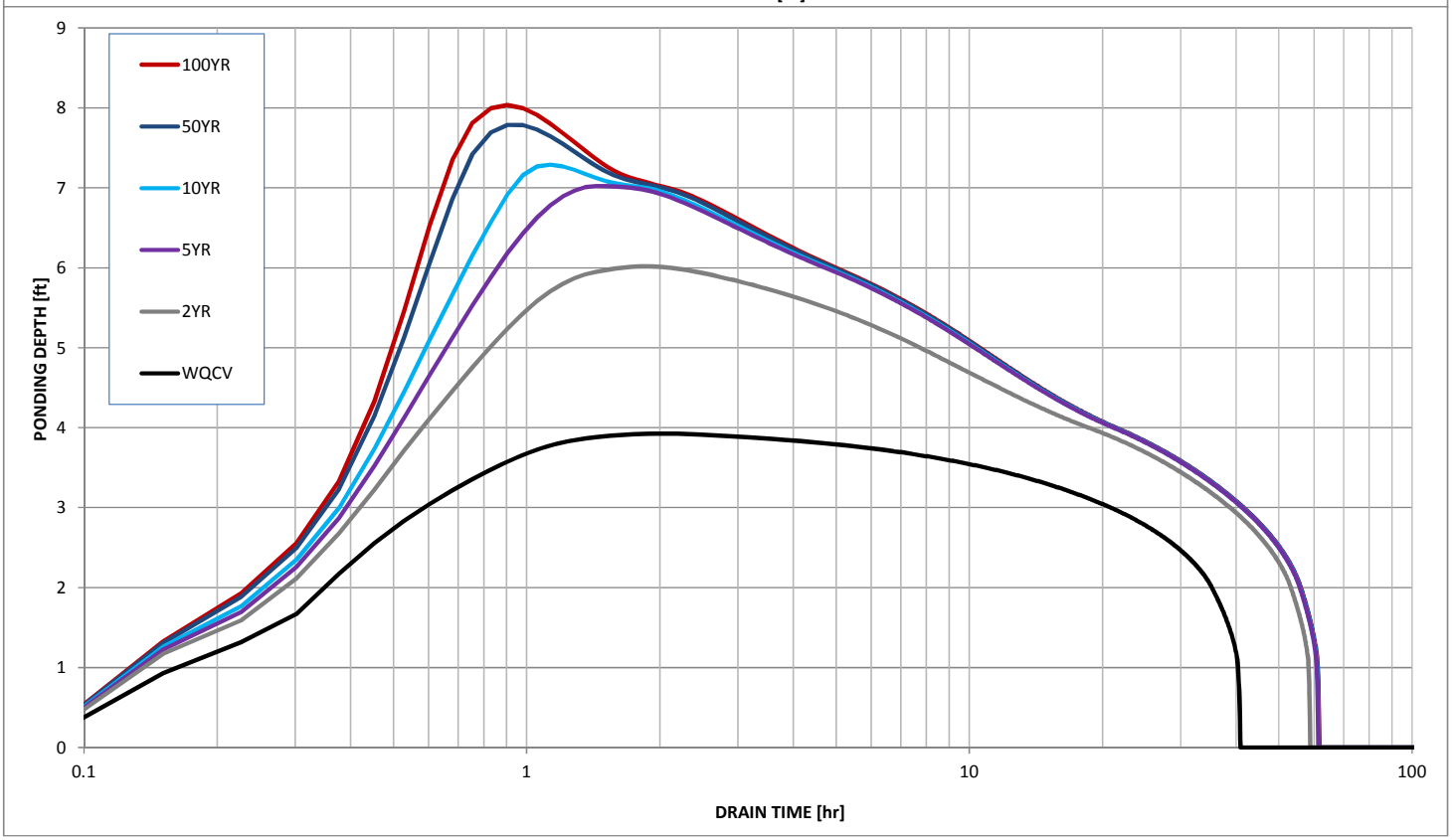
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	3.515	9.641	13.459	16.659	25.205	29.878	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	3.514	9.632	13.455	16.650	25.201	29.878	acre-ft
Time to Drain 97% of Inflow Volume =	37.9	52.4	**53.0**	51.8	48.4	46.7	hours
Time to Drain 99% of Inflow Volume =	39.6	56.1	57.7	57.2	55.7	**55.0**	hours
Maximum Ponding Depth =	3.93	6.02	7.02	7.29	7.79	8.04	ft
Maximum Ponded Area =	2.47	2.77	2.90	2.93	2.99	**3.03**	acres
Maximum Volume Stored =	3.300	8.831	11.685	12.455	13.921	14.666	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond D2
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°44'06.26"N, Longitude: 104°37'50.17"W

Assessor's Parcel #: 5500000402 Section: 14 Township: 15 South Range: 65 West

Expected Completion date: August, 2018

Project acreage: 275 acres Design Ponding Acres: 2.03 acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond D2 is an Extended Detention Basin including water quality capture volume for Lorson East Phase 1. The detention pond has been designed in accordance with full spectrum design.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards achieved.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond D2**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.025	ft/ft
Watershed Length =	2200	ft
Watershed Area =	89.00	acres
Watershed Imperviousness =	55.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =		percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

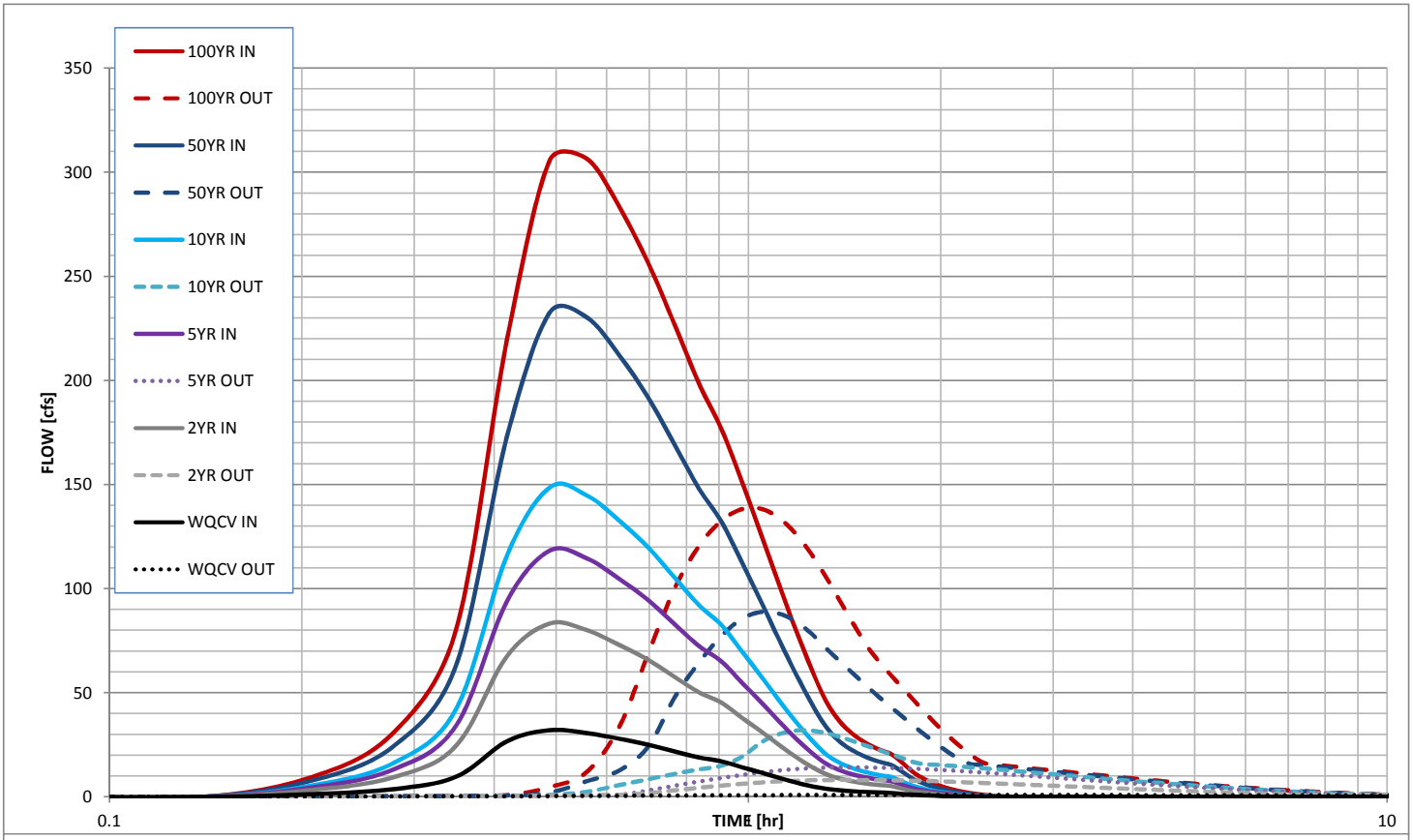
User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	20	0.00	0.00
0.33	100	0.33	0.08
1.00	1,074	1.00	0.23
2.00	48,988	2.00	0.49
3.00	72,821	3.00	1.10
4.00	76,610	4.00	8.28
5.00	80,493	5.00	15.94
6.00	84,486	6.00	69.94
7.00	88,582	7.00	138.09
8.00	92,768	8.00	250.49
9.00	97,074	9.00	471.55
10.00	102,033	10.00	790.99
11.00	106,000	11.00	1211.23

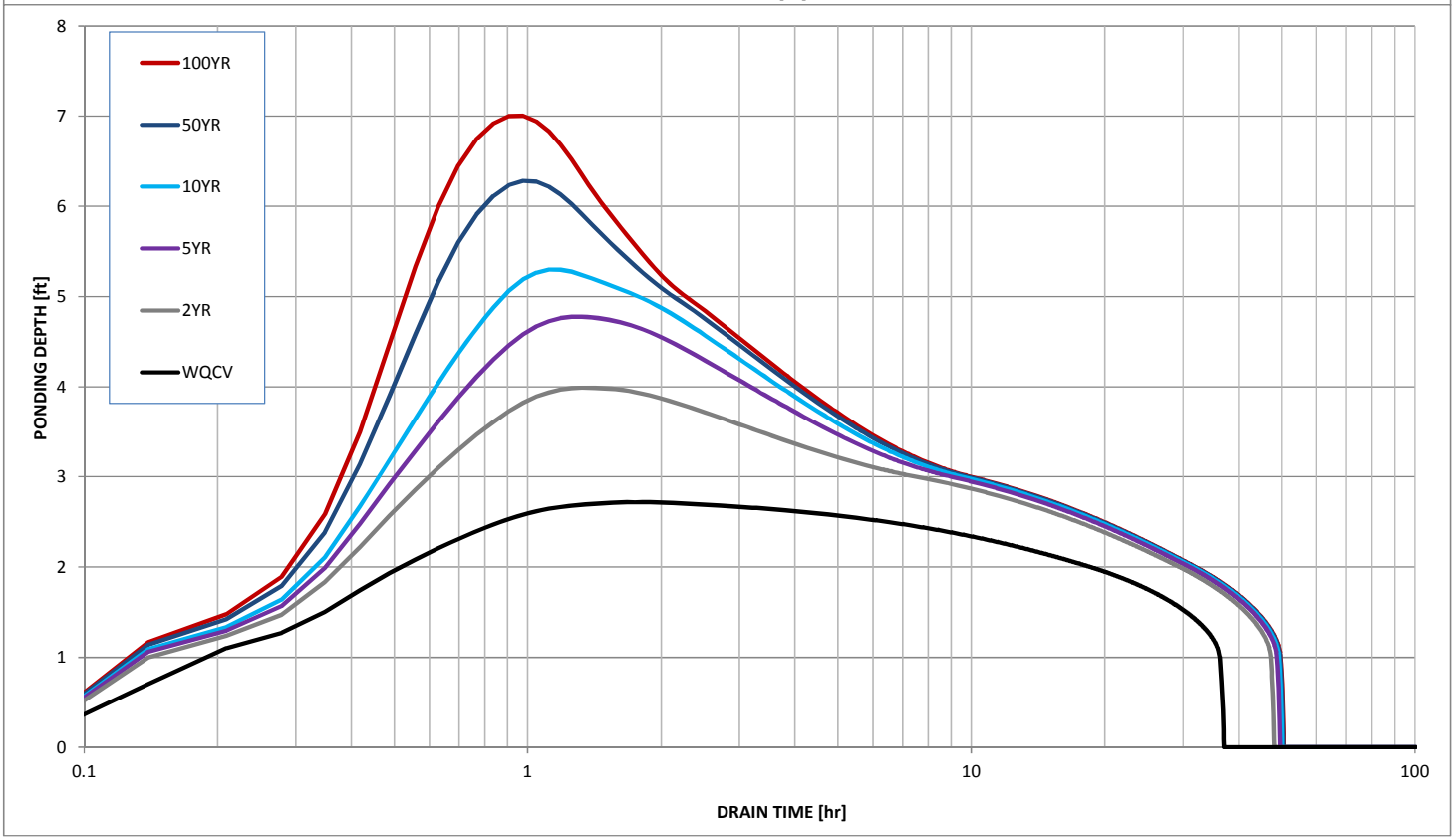
After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.68	in
Calculated Runoff Volume =	1.635	4.303	6.164	7.797	12.380	16.458	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	1.634	4.302	6.162	7.790	12.373	16.451	acre-ft
Time to Drain 97% of Inflow Volume =	34.5	42.4	**42.1**	41.0	37.2	34.1	hours
Time to Drain 99% of Inflow Volume =	36.0	45.8	46.5	46.4	45.0	**43.7**	hours
Maximum Ponding Depth =	2.72	3.99	4.78	5.30	6.28	7.00	ft
Maximum Ponded Area =	1.51	1.76	1.83	1.87	1.97	**2.03**	acres
Maximum Volume Stored =	1.514	3.667	5.063	6.036	7.927	9.372	acre-ft

Stormwater Detention and Infiltration Design Data Sheet





El Paso County MS4 Post Construction Detention / Water Quality Facility Documentation Form

This document **must be completed and submitted** with required attachments to the County for projects requiring a detention and/or a water quality facility. A separate completed form must be submitted for each facility.

Project name: Lorson Ranch East – Pond E1
Owner name: Lorson Ranch Metropolitan District
Location Address: 212 N. Wahsatch Avenue, Suite 301
Latitude and Longitude:
Latitude: 38°43'56.38"N, Longitude: 104°37'31.32"W

Assessor's Parcel #: 5500000282 Section: 24 Township: 15 South Range: 65 West

Expected Completion date: August, 2019

Project acreage: 275 acres Design Ponding Acres: 1.10acres Design Storm: 100-year

Design Engineer Email Address: rich@ceg1.com

To ensure compliance with C.R.S. 37-92-602(8), the completed Stormwater Detention and Infiltration Design Data Sheet **must be attached**. The form can be found here: https://maperture.digitaldataservices.com/gvh/?viewer=cswdif# (click on Download SDI Design Data Sheet)

List all permanent water quality control measure(s) (EDBs, rain gardens, etc):
Pond E1 is an Extended Detention Basin with only existing undeveloped overland flows entering the pond. An outlet structure for Water quality capture volume will be added when upstream development occurs . The detention pond has been sized in accordance with future full spectrum designs requirements for fully developed tributary areas. The interim outlet structure is a RCP storm sewer.

For all projects for which the constrained redevelopment sites standard is applied, provide an explanation of why it is not practicable to meet the full design standards. Answer: full design standards will be achieved when tributary area is developed and a full spectrum outlet structure is constructed.

Attach Operations and Maintenance (O&M) Plan describing the operation and maintenance procedures that ensure the long-term observation, maintenance, and operation of control measure(s), including routine inspection frequencies and maintenance activities. If multiple, different water quality control measures are used at the same location, a separate O & M Plan must be provided for each facility.

Attach Private Detention Basin / Stormwater Quality Best Management Practice Maintenance Agreement and Easement addressing maintenance of BMPs that shall be binding on all subsequent owners of the permanent BMPs.

Attachments:

Stormwater Detention and Infiltration Design Data Sheet
O & M Plan
Maintenance and Access Agreement

Review Engineer

EPC Project File No.

Stormwater Detention and Infiltration Design Data Sheet

Workbook Protected Worksheet Protected

Stormwater Facility Name: **Pond E1 - fully developed conditions with full spectrum outlet**

Facility Location & Jurisdiction: **Lorson Ranch East, El Paso County, CO**

User Input: Watershed Characteristics

Watershed Slope =	0.038	ft/ft
Watershed Length =	1600	ft
Watershed Area =	56.50	acres
Watershed Imperviousness =	50.0%	percent
Percentage Hydrologic Soil Group A =		percent
Percentage Hydrologic Soil Group B =	6.0%	percent
Percentage Hydrologic Soil Groups C/D =	94.0%	percent

Location for 1-hr Rainfall Depths (use dropdown): User Input

WQCV Treatment Method = Extended Detention

User Defined Stage [ft]	User Defined Area [ft^2]	User Defined Stage [ft]	User Defined Discharge [cfs]
0.00	200	0.00	0.00
0.33	500	0.33	0.06
1.00	2,550	1.00	0.12
2.00	25,900	2.00	0.28
3.00	31,341	3.00	0.49
4.00	33,851	4.00	2.13
5.00	36,442	5.00	3.00
6.00	39,105	6.00	27.00
7.00	41,838	7.00	28.00
8.00	44,644	8.00	29.70
9.00	47,527	9.00	31.40
10.00	50,487	10.00	32.00

After completing and printing this worksheet to a pdf, go to:
https://maperture.digitaldataservices.com/gvh/?viewer=cswdif
create a new stormwater facility, and
attach the pdf of this worksheet to that record.

Routed Hydrograph Results

Design Storm Return Period =	WQCV	2 Year	5 Year	10 Year	50 Year	100 Year	
One-Hour Rainfall Depth =	0.53	1.16	1.44	1.68	2.16	2.42	in
Calculated Runoff Volume =	0.971	2.447	3.557	4.587	7.545	9.136	acre-ft
OPTIONAL Override Runoff Volume =							acre-ft
Inflow Hydrograph Volume =	0.971	2.447	3.556	4.586	7.540	9.134	acre-ft
Time to Drain 97% of Inflow Volume =	39.0	47.9	**47.6**	45.9	42.0	40.2	hours
Time to Drain 99% of Inflow Volume =	41.2	52.0	52.8	52.1	50.8	**50.2**	hours
Maximum Ponding Depth =	2.88	4.58	5.44	5.98	8.16	9.36	ft
Maximum Ponded Area =	0.70	0.81	0.86	0.90	1.03	**1.12**	acres
Maximum Volume Stored =	0.917	2.216	2.930	3.403	5.502	6.794	acre-ft

Stormwater Detention and Infiltration Design Data Sheet