MENAR HYDROSYSTEMS ENGINEERING, P.S.C.

HYDROLOGY • HYDRAULICS • SEDIMENT TRANSPORT

WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Landfill North (LN)** **CONDITION:** **EXISTING**

BASIN AREA (Ac) = 14.78

BASIN AREA (mi^2) = 0.0231

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Costa-Pitahay (CuF), D	Grass	82	0.51	41.82
Costa-Pitahay (CuF), D	Open Spaces	89	0.57	50.73
Landfill (LfC), D	Open Spaces	89	12.19	1084.91
Pithaya-Limestone (PsF), D	Grass	82	1.51	123.82
				0
				0
				0
				0
		Totals	14.78	1301

CN	88

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WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Landfill South (LS)** **CONDITION:** **EXIS & PROP**

BASIN AREA (Ac) = 6.91

BASIN AREA (mi^2) = 0.0108

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Landfill (LfC), D	Open Spaces	89	6.71	597.19
Pithaya-Limestone (PsF), D	Open Spaces	89	0.20	17.8
				0
				0
				0
				0
				0
				0
		Totals	6.91	615

CN	89

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WORKSHEET: CURVE NUMBER

Project: Yauco Landfill By: YACD Date: Sept 24 2008

Location: Yauco, PR Checked: MMF Date: Sept 24 2008

BASIN NAME: Landfill East (LE) **CONDITION: EXISTING**

BASIN AREA (Ac) = 7.50

BASIN AREA (mi^2) = 0.0117

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Landfill (LfC), D	Grass	82	0.86	70.52
Landfill (LfC), D	Open Spaces	89	5.27	469.03
Pithaya-Limestone (PsF), D	Grass	82	1.10	90.2
Pithaya-Limestone (PsF), D	Open Spaces	89	0.27	24.03
				0
				0
				0
				0
		Totals	7.50	654

CN	87

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WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Landfill West (LW)** **CONDITION:** **EXIS & PROP**

BASIN AREA (Ac) = 1.92

BASIN AREA (mi^2) = 0.0030

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Landfill (LfC), D	Open Spaces	89	1.92	170.88
				0
				0
				0
				0
				0
				0
				0
		Totals	1.92	171

CN	89

WORKSHEET: CURVE NUMBER

Project: Yauco Landfill By: YACD Date: Sept 24 2008

Location: Yauco, PR Checked: MMF Date: Sept 24 2008

BASIN NAME: **Basin North (BASN)** **CONDITION:** **PROPOSED**

BASIN AREA (Ac) = 43.84

BASIN AREA (mi^2) = 0.0685

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Costa-Pitahay (CuF), D	Grass	82	21.07	1727.74
Costa-Pitahay (CuF), D	Open Spaces	89	9.29	826.81
El Papayo (EpF), D	Grass	82	2.34	191.88
Guayacan (GyC), D	Grass	82	3.14	257.48
Landfill (LfC), D	Open Spaces	89	2.07	184.23
Melones (MnC), D	Grass	82	0.12	9.84
Pithaya-Limestone (PsF), D	Grass	82	5.81	574
				0
		Totals	43.84	3772

CN	86

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WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Basin East (BASE)** **CONDITION:** **PROPOSED**

BASIN AREA (Ac) = 58.01

BASIN AREA (mi^2) = 0.0906

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Pithaya-Limestone (PsF), D	Grass	82	54.92	4503.44
Pithaya-Limestone (PsF), D	Open Spaces	89	3.09	275.01
				0
				0
				0
				0
				0
				0
		Totals	58.01	4779

CN	82

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WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Landfill North (LN)** **CONDITION:** **PROPOSED**

BASIN AREA (Ac) = 21.21

BASIN AREA (mi^2) = 0.0331

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Landfill (LfC), D	Open Spaces	89	21.21	1887.69
				0
				0
				0
				0
				0
				0
				0
		Totals	21.21	1888

CN	89

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WORKSHEET: CURVE NUMBER

Project:	Yauco Landfill	By:	YACD	Date:	Sept 24 2008
Location:	Yauco, PR	Checked:	MMF	Date:	Sept 24 2008

BASIN NAME: **Landfill East (LE)** **CONDITION:** **PROPOSED**

BASIN AREA (Ac) = 15.64

BASIN AREA (mi^2) = 0.0244

SOILS NAME (SYMBOL), HYDROLOGIC SOIL GROUP	LAND USE	CN	AREA, (Ac)	PRODUCT OF AREA x CN
Landfill (LfC), D	Open Spaces	89	15.64	1391.96
				0
				0
				0
				0
				0
				0
				0
		Totals	15.64	1392

CN	89

WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: EXISTING **BASIN NAME: BASN**

L = 793.4 meters x 3.28 = 2,603.02 feet

S = 175.7 (top) – 74.2 (bottom) = 101.50 ÷ 793.4 = 0.1279

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(2603.02)^{0.77}}{(0.1279)^{0.385}}$$

Total = 0.122 x 60 = 7.32 minutes*

Tc = 7 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: 17°59'51.99 N **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: **EXIS & PROP** **BASIN NAME:** **BASW**

L = 528.2 meters x 3.28 = 1,732.94 feet

S = 167.0 (top) – 116.5 (bottom) = 50.50 ÷ 528.2 = 0.0956

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(1732.94)^{0.77}}{(0.0956)^{0.385}}$$

Total = 0.100 x 60 = 6 minutes*

Tc = 6 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: **17°59'51.99 N** **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

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WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: EXISTING **BASIN NAME: BASE**

L = 758.7 meters x 3.28 = 2,489.17 feet

S = 176.6 (top) – 113.5 (bottom) = 63.10 ÷ 758.7 = 0.0832

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(2489.17)^{0.77}}{(0.0832)^{0.385}}$$

Total = 0.140 x 60 = 8.4 minutes*

Tc = 8 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: 17°59'51.99 N **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

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WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: **EXIS & PROP** **BASIN NAME:** **BASS**

L = 213 meters x 3.28 = 698.82 feet

S = 132.2 (top) – 94.0 (bottom) = 38.20 ÷ 213 = 0.1793

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(698.82)^{0.77}}{(0.1793)^{0.385}}$$

Total = 0.039 x 60 = 2.34 minutes*

Tc = 5 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: **17°59'51.99 N** **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: **EXIS & PROP** **BASIN NAME:** **BASSE**

L = 152 meters x 3.28 = 498.69 feet

S = 137.8 (top) – 95.0 (bottom) = 42.80 ÷ 152 = 0.2816

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(498.69)^{0.77}}{(0.2816)^{0.385}}$$

Total = 0.025 x 60 = 1.5 minutes*

Tc = 5 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: **17°59'51.99 N** **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: **EXIS & PROP** **BASIN NAME:** **BASSW**

L = 369 meters x 3.28 = 1,210.63 feet

S = 157.0 (top) – 95.0 (bottom) = 62.00 ÷ 369 = 0.1680

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(1210.63)^{0.77}}{(0.1680)^{0.385}}$$

Total = 0.061 x 60 = 3.66 minutes*

Tc = 5 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: **17°59'51.99 N** **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56

WORKSHEET: TIME OF CONCENTRATION (Tc)

CONDITION: EXISTING **BASIN NAME: LN**

L = 277.8 meters x 3.28 = 911.42 feet

S = 149 (top) – 116 (bottom) = 33.00 ÷ 414 = 0.0797

Equation

$$Tc = \frac{0.00013L^{0.77}}{S^{0.385}}$$

$$Tc = 0.00013 \times \frac{(911.42)^{0.77}}{(0.0797)^{0.385}}$$

Total = 0.065 x 60 = 3.9 minutes*

Tc = 5 Minutes

*If the total is less than 5 minutes use 5 min.

RAINFALL INCHES

Latitude: 17°59'51.99 N **Longitude: 66°51'47.03" W**

Rainfall Event

Duration, hr	0.083	0.25	1	2	3	6	12	24
Rainfall, in 2-YR	0.64	1.13	2.68	3.37	3.55	4.06	4.47	5.15
Rainfall, in 100-YR	1.03	1.81	4.31	6.19	7.14	9.69	13.34	17.56