

Attachment 1: Sewer Deflection Curves

This attachment provides methods to calculate phosphorus and nitrogen (nutrient) load reductions for sewer deflection projects. Sewer deflection, or partial sewer separation is an approach that involves diverting a portion of stormwater *back to* an existing combined sewer (CS) for discharge to a wastewater treatment plant. Stormwater not diverted to the treatment plant is discharged to receiving waters without additional treatment. The performance curves represent weir-based and in-line deflection device configurations and can also be created using orifice management rules for diverting the first flush only.¹

These 44 curves can be used to estimate the performance of other deflection devices and can be applied using the following steps:

1. Delineate the deflection device drainage area (i.e., the upstream contributing area to the orifice structure) and calculate the directly connected impervious area (DCIA) within the drainage (ac). Estimate the annual phosphorus and/or nitrogen load directed to the deflection device according to Attachment 3 of Appendix F.
2. Identify the stormwater network within the deflection device drainage area and create the F-table representing depth (foot) and storage capacity (acre-inch) based on the pipe dimensions.
3. Estimate runoff capture depth (inch) as the storage capacity divided by the DCIA.
4. Based on the device's configuration (i.e., inline diversion with no temporary storage or device with temporary storage), choose the appropriate performance curve based on the device characteristics (pipe slope, orifice diameter, weir height) and read the percentage reductions based on the estimated runoff capture depth. Curves should be chosen by picking the one closer to the lower end or by interpolating between two curves if necessary.

¹ Additional information about the generation of the sewer deflection curves can be found in Development of Performance Curves for Partial Sewer Separation, Subtask 3B Technical Memorandum: Development of, and Modeling Approach for Conceptual Generic Representation of City of Cambridge, MA Sewer Deflection Devices, June 30, 2024 found on the EPA Region 1 Stormwater Tools website at <https://www.epa.gov/npdes-permits/stormwater-tools-new-england#swbmp>.

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Table 1: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.04%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.04%) SCM Performance Table: Long-Term Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	49%	59%	64%	66%	67%	69%	71%	73%
Cumulative Phosphorus Load Reduction	57%	65%	68%	70%	71%	72%	74%	75%
Cumulative Nitrogen Load Reduction	55%	64%	67%	69%	70%	71%	73%	75%

Figure 1: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.04%) SCM Performance Curve

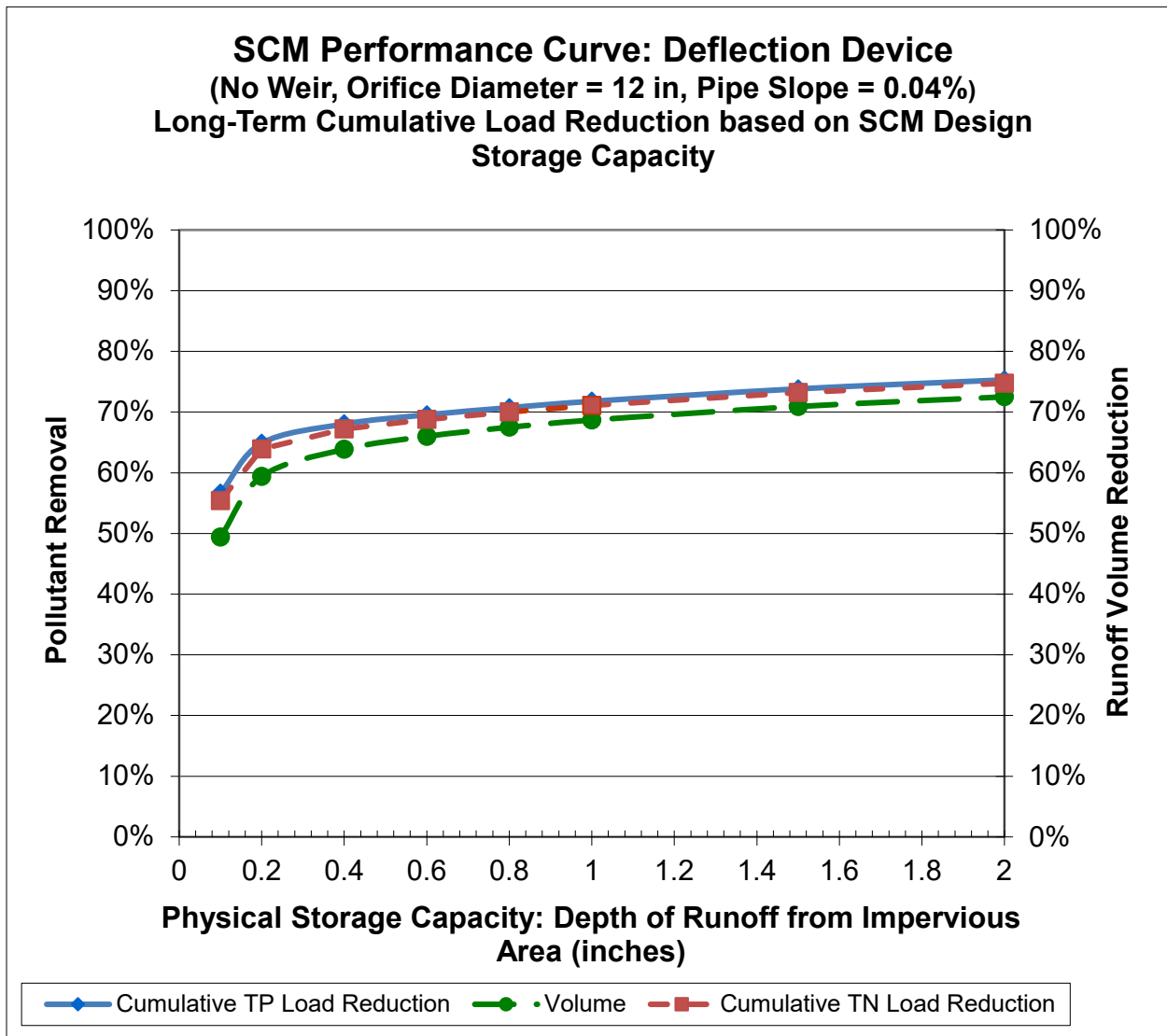


Table 2: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.189%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.189%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	39%	46%	50%	51%	53%	54%	56%	57%
Cumulative Phosphorus Load Reduction	44%	51%	53%	55%	55%	56%	58%	60%
Cumulative Nitrogen Load Reduction	43%	50%	53%	54%	55%	56%	58%	59%

Figure 2: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.189%) SCM Performance Curve

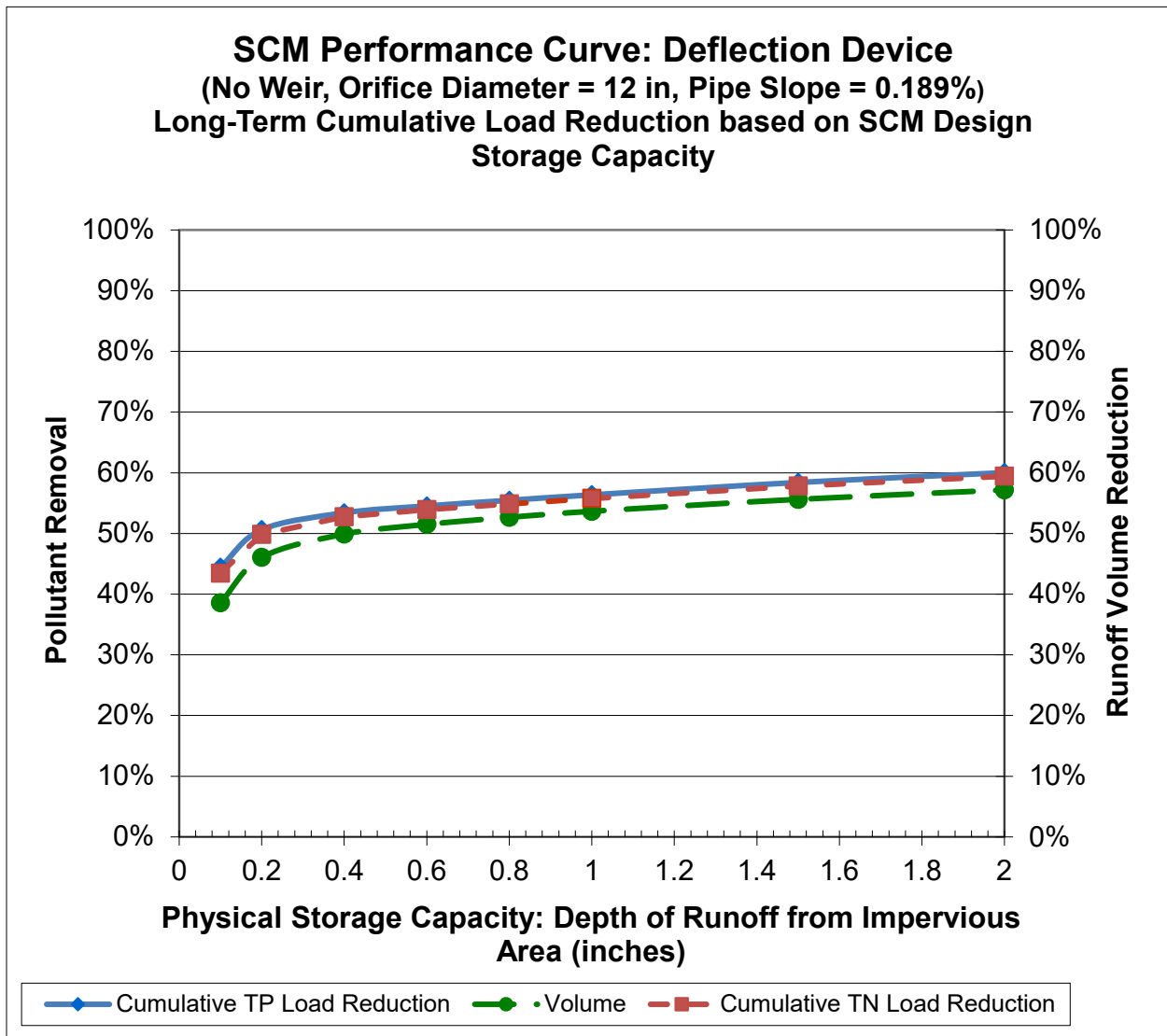


Table 3: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.5%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.5%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	32%	37%	41%	42%	43%	44%	45%	47%
Cumulative Phosphorus Load Reduction	36%	41%	44%	45%	45%	46%	48%	49%
Cumulative Nitrogen Load Reduction	36%	41%	43%	44%	45%	46%	47%	49%

Figure 3: Deflection Device (No Weir, Orifice Diameter = 12 in, Pipe Slope = 0.5%) SCM Performance Curve

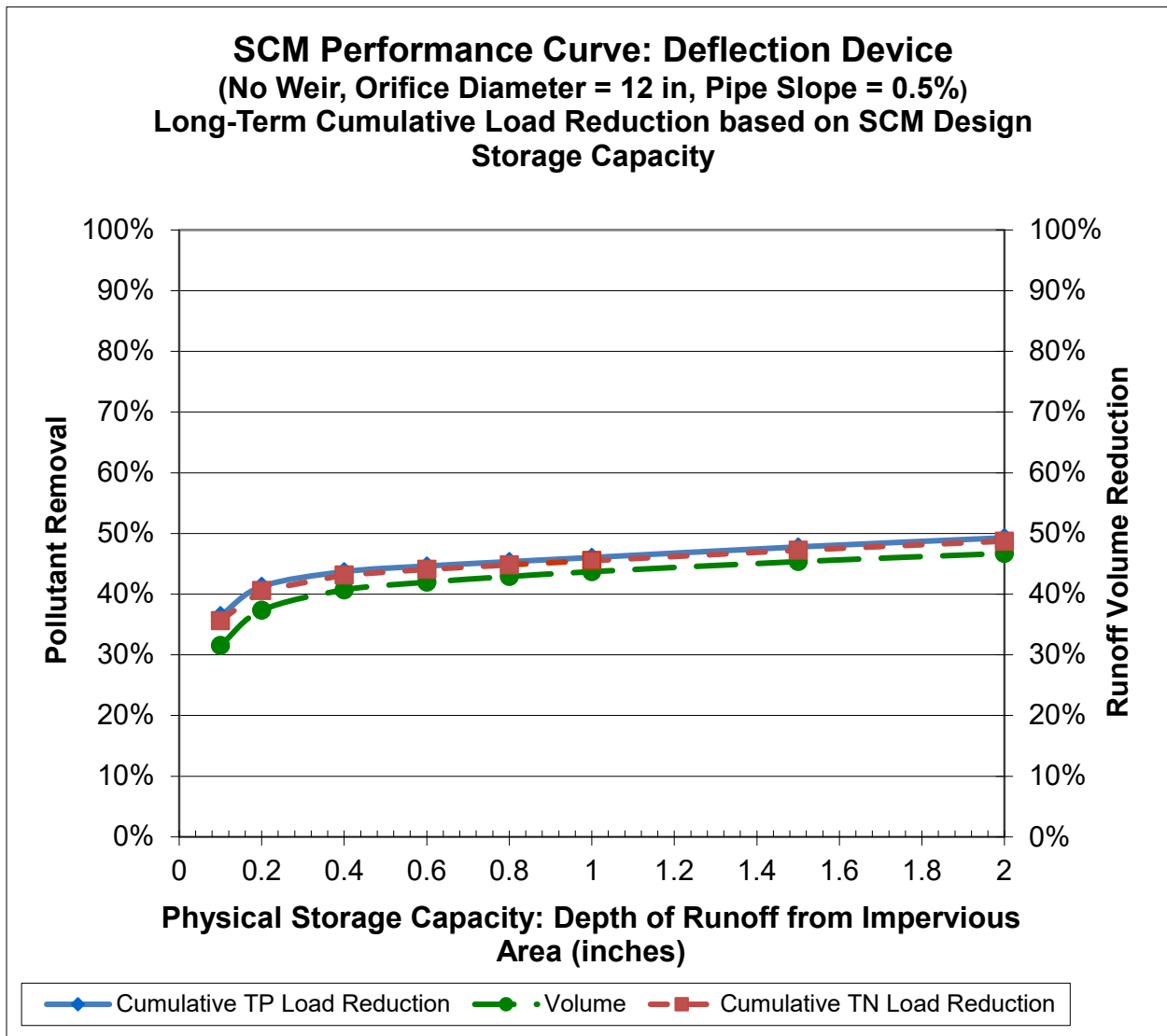


Table 4: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.04%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.04%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	53%	64%	71%	73%	74%	75%	76%	77%
Cumulative Phosphorus Load Reduction	61%	70%	74%	75%	76%	77%	79%	80%
Cumulative Nitrogen Load Reduction	59%	69%	73%	75%	76%	76%	78%	79%

Figure 4: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.04%) SCM Performance Curve

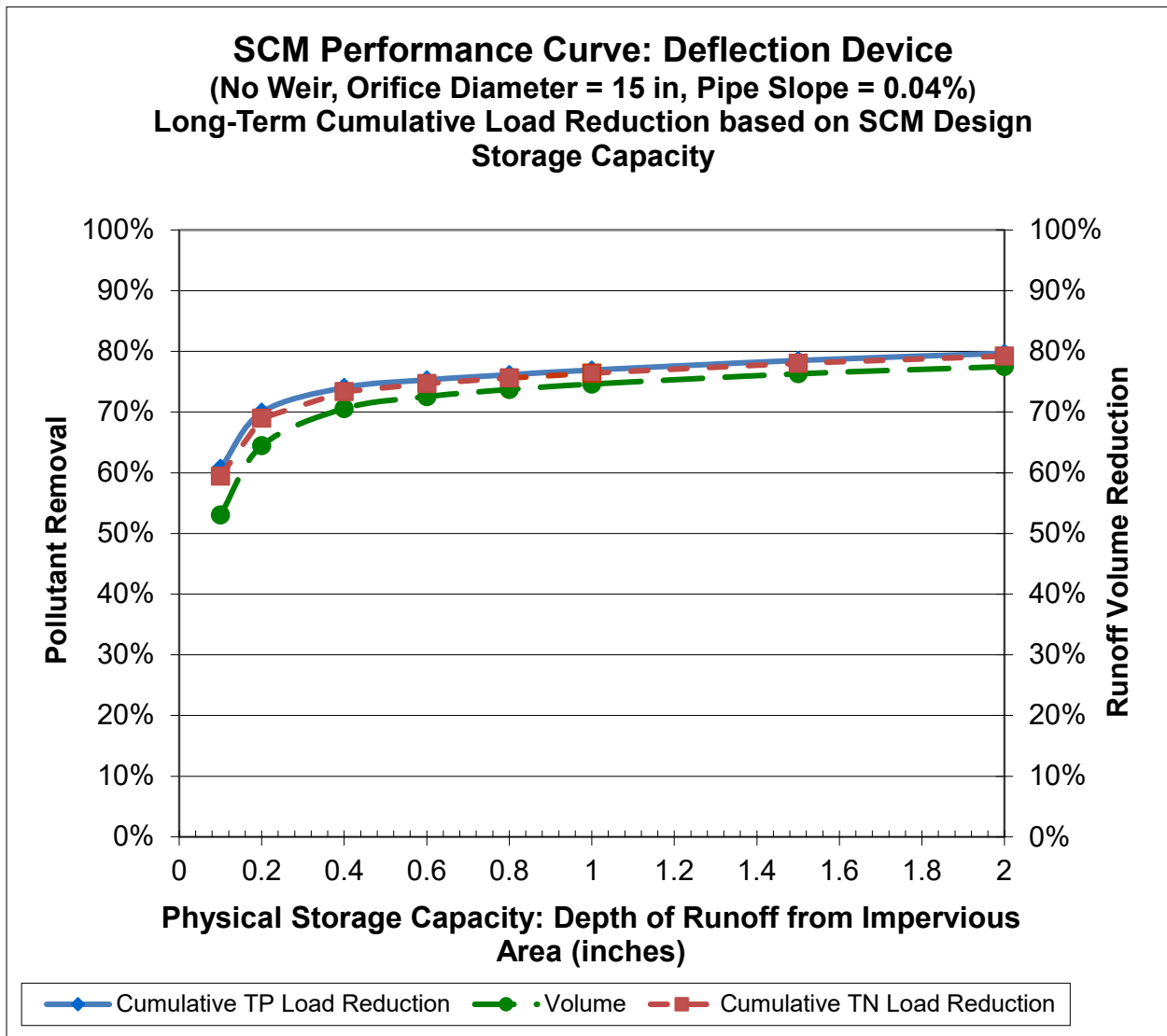


Table 5: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.189%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.189%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	43%	51%	56%	58%	59%	60%	62%	63%
Cumulative Phosphorus Load Reduction	49%	56%	60%	61%	62%	62%	64%	66%
Cumulative Nitrogen Load Reduction	48%	55%	59%	60%	61%	62%	64%	65%

Figure 5: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.189%) SCM Performance Curve

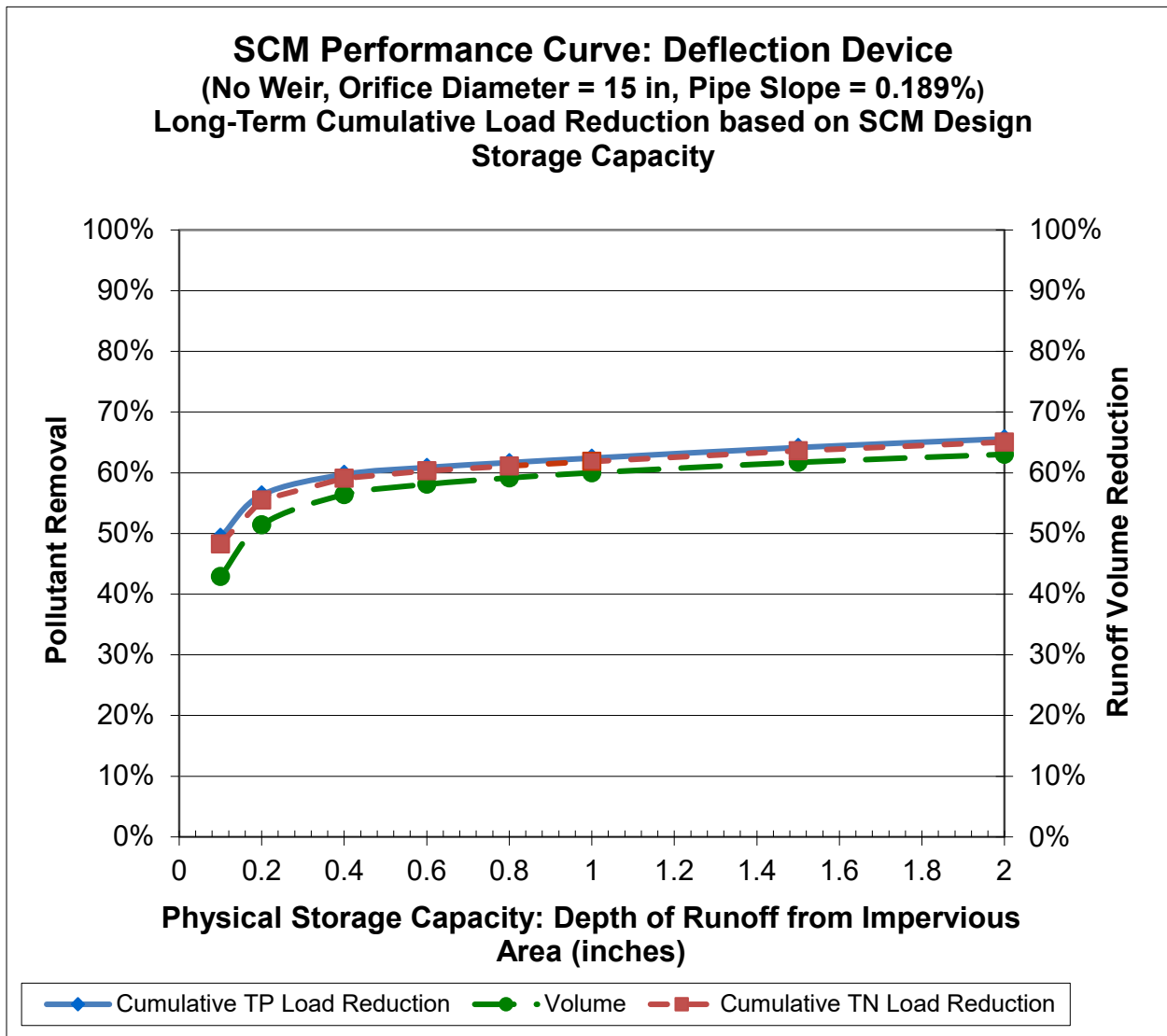


Table 6: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.5%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.5%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	36%	43%	47%	48%	49%	50%	51%	53%
Cumulative Phosphorus Load Reduction	41%	47%	50%	51%	51%	52%	54%	55%
Cumulative Nitrogen Load Reduction	41%	46%	49%	50%	51%	52%	53%	55%

Figure 6: Deflection Device (No Weir, Orifice Diameter = 15 in, Pipe Slope = 0.5%) SCM Performance Curve

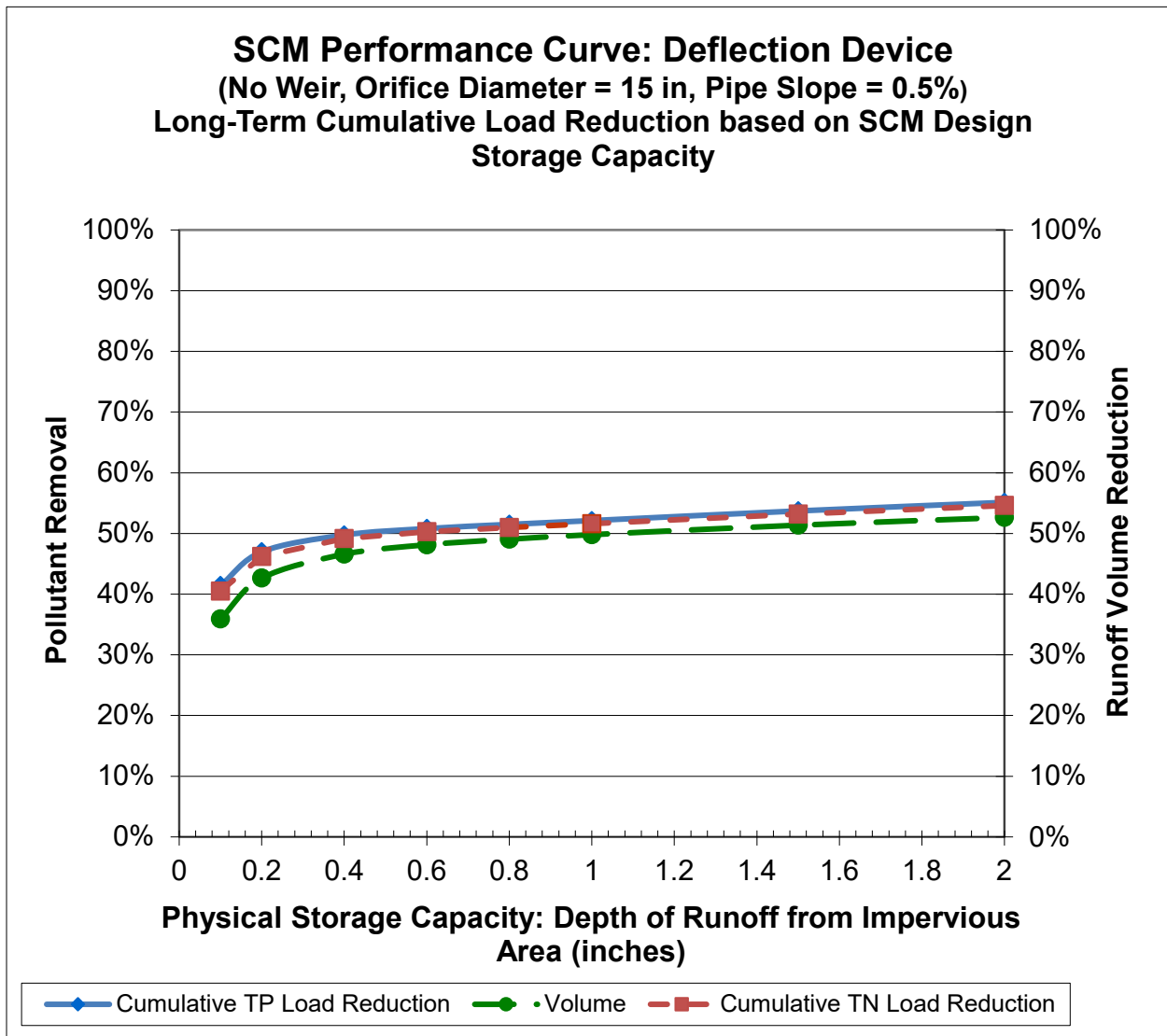


Table 7: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.04%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.04%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	56%	68%	75%	77%	78%	79%	80%	81%
Cumulative Phosphorus Load Reduction	64%	73%	78%	79%	80%	81%	82%	83%
Cumulative Nitrogen Load Reduction	62%	72%	77%	79%	79%	80%	81%	82%

Figure 7: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.04%) SCM Performance Curve

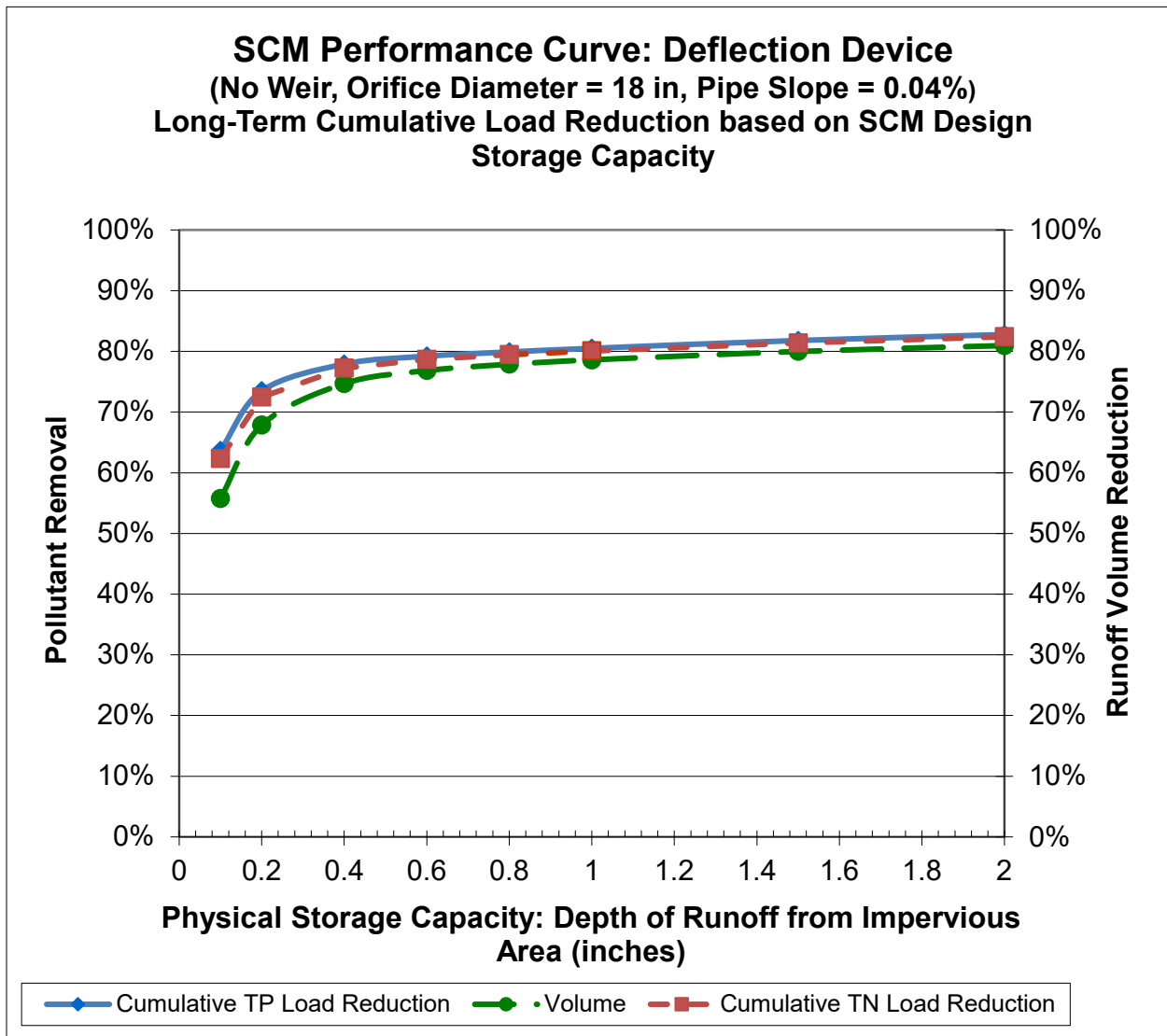


Table 8: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.189%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.189%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	56%	68%	75%	77%	78%	79%	80%	81%
Cumulative Phosphorus Load Reduction	64%	73%	78%	79%	80%	81%	82%	83%
Cumulative Nitrogen Load Reduction	62%	72%	77%	79%	79%	80%	81%	82%

Figure 8: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.189%) SCM Performance Curve

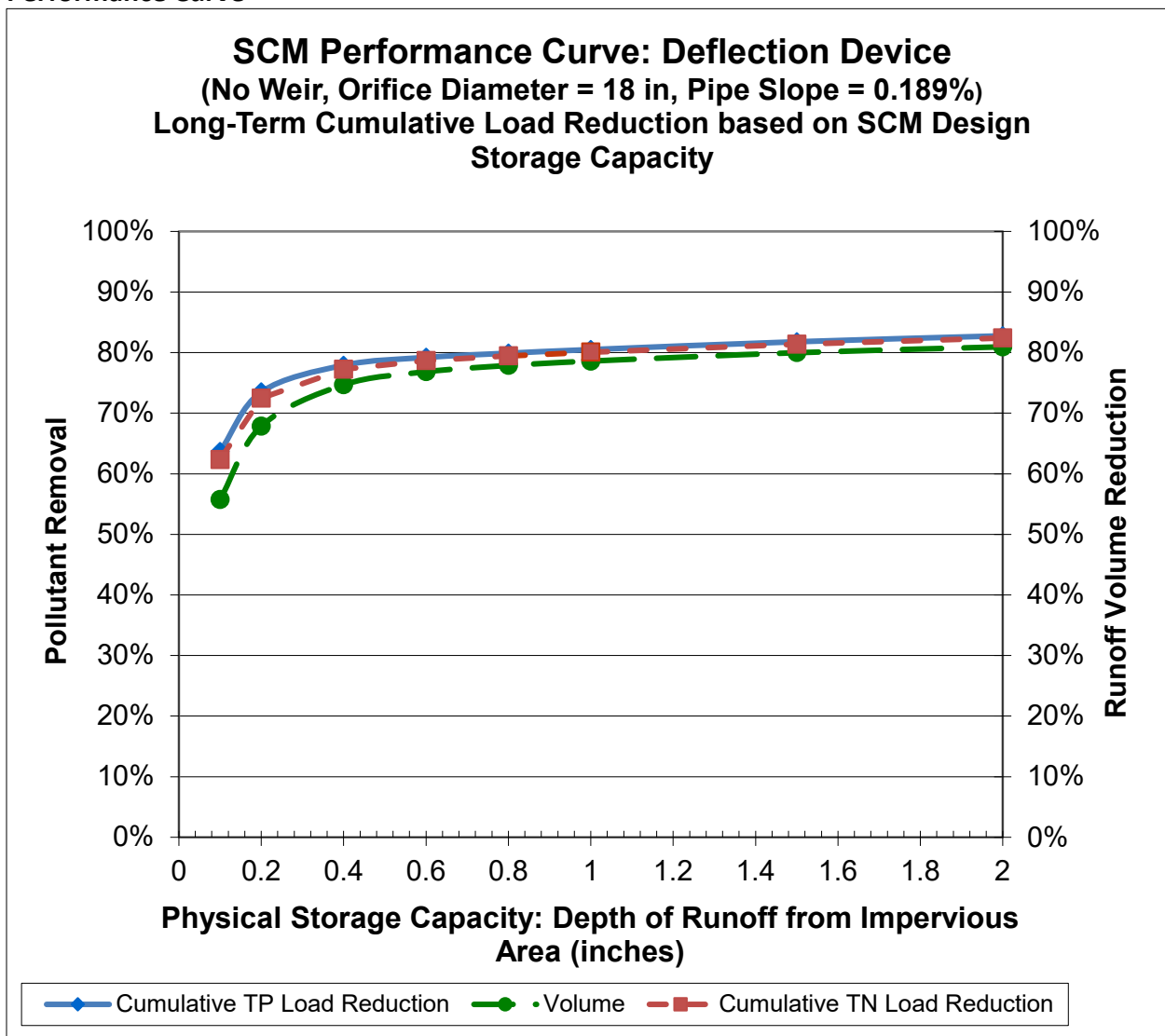


Table 9: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.5%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.5%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	40%	47%	51%	53%	54%	55%	56%	57%
Cumulative Phosphorus Load Reduction	45%	52%	55%	56%	56%	57%	59%	60%
Cumulative Nitrogen Load Reduction	44%	51%	54%	55%	56%	57%	58%	59%

Figure 9: Deflection Device (No Weir, Orifice Diameter = 18 in, Pipe Slope = 0.5%) SCM Performance Curve

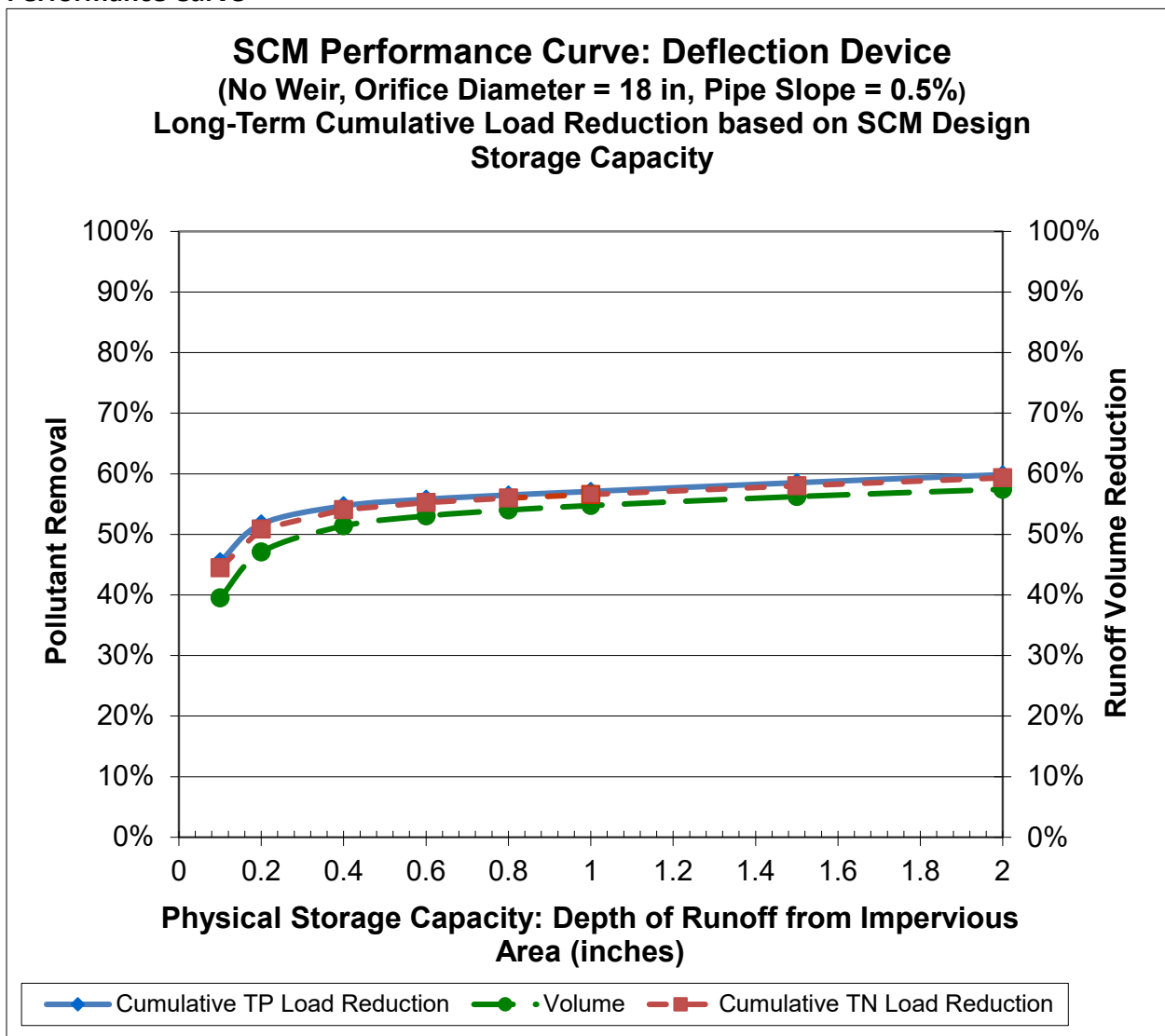


Table 10: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.04%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.04%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	29%	32%	36%	39%	41%	43%	47%	51%
Cumulative Phosphorus Load Reduction	34%	37%	41%	44%	46%	49%	53%	56%
Cumulative Nitrogen Load Reduction	33%	36%	40%	43%	45%	48%	52%	55%

Figure 10: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.04%) SCM Performance Curve

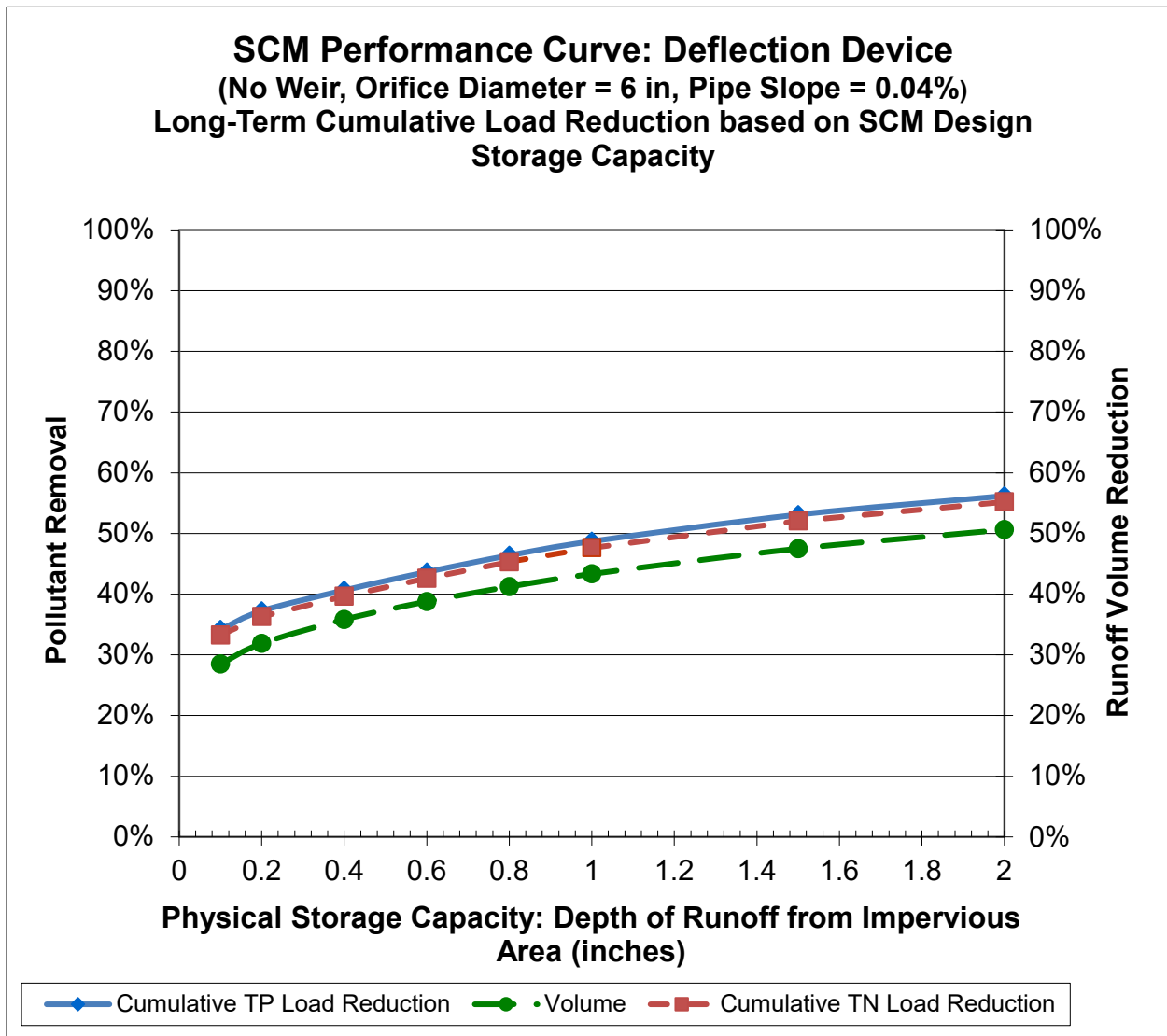


Table 11: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.189%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.189%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	22%	24%	27%	29%	30%	31%	34%	36%
Cumulative Phosphorus Load Reduction	26%	28%	30%	32%	34%	35%	38%	40%
Cumulative Nitrogen Load Reduction	26%	28%	30%	31%	33%	34%	37%	40%

Figure 11: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.189%) SCM Performance Curve

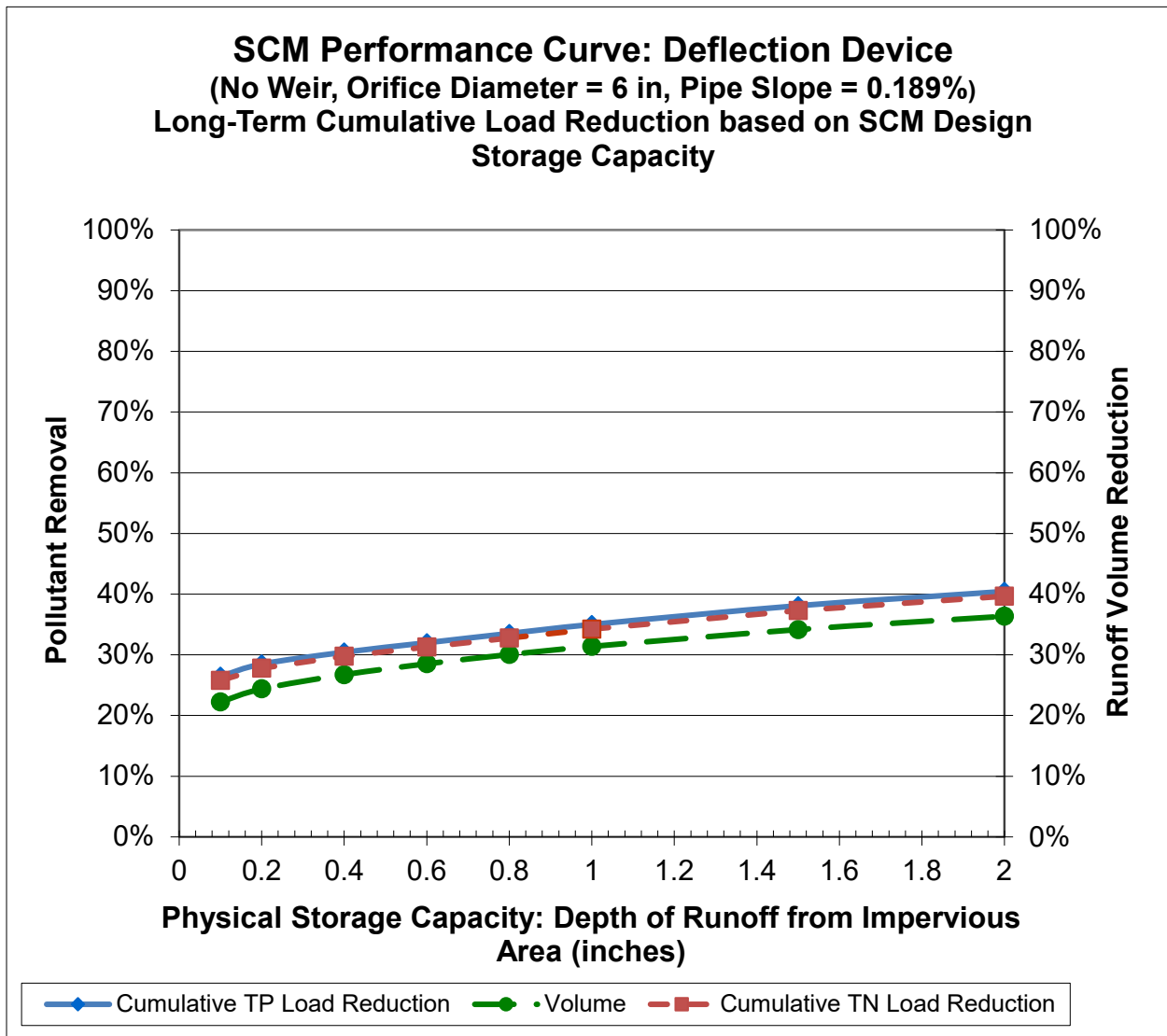


Table 12: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.5%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.5%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	18%	20%	22%	23%	24%	25%	27%	28%
Cumulative Phosphorus Load Reduction	22%	23%	25%	26%	26%	27%	30%	31%
Cumulative Nitrogen Load Reduction	21%	23%	24%	25%	26%	27%	29%	31%

Figure 12: Deflection Device (No Weir, Orifice Diameter = 6 in, Pipe Slope = 0.5%) SCM Performance Curve

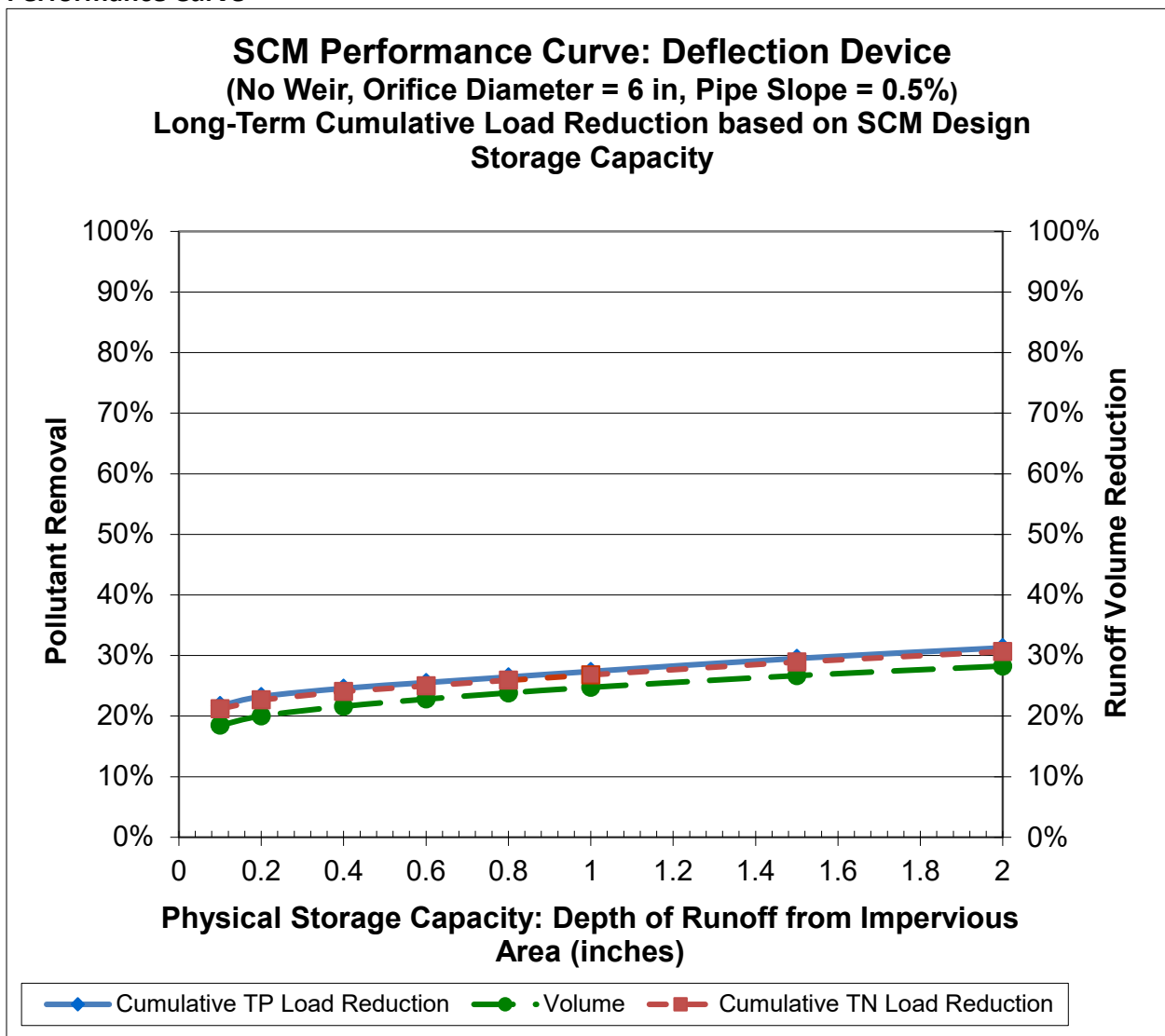


Table 13: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.04%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.04%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	43%	49%	53%	55%	57%	59%	62%	64%
Cumulative Phosphorus Load Reduction	50%	55%	58%	60%	62%	63%	66%	68%
Cumulative Nitrogen Load Reduction	49%	54%	57%	59%	61%	63%	66%	68%

Figure 13: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.04%) SCM Performance Curve

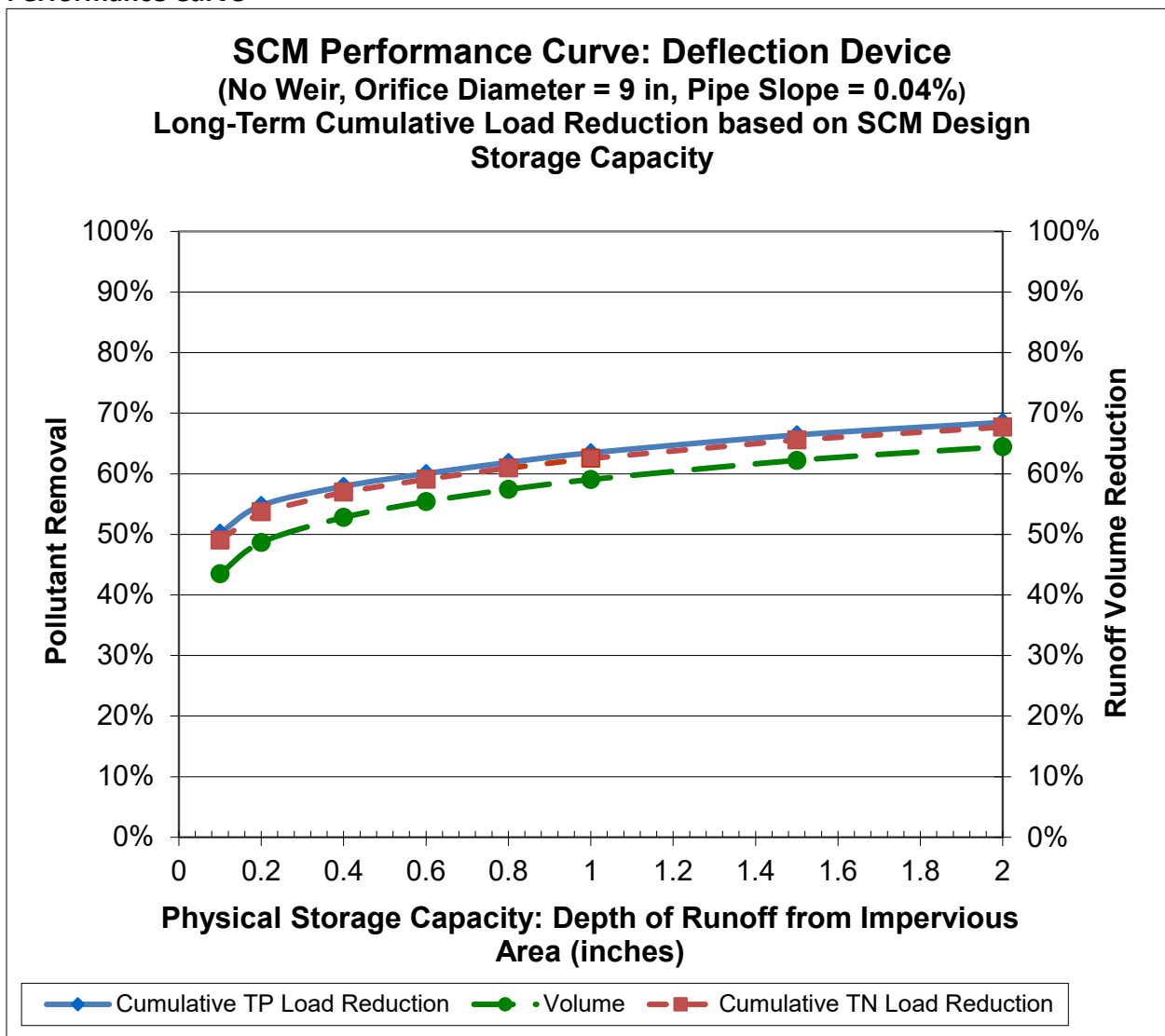


Table 14: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.189%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.189%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	33%	38%	40%	42%	43%	45%	47%	49%
Cumulative Phosphorus Load Reduction	38%	42%	44%	46%	47%	48%	50%	52%
Cumulative Nitrogen Load Reduction	37%	41%	44%	45%	46%	47%	50%	52%

Figure 14: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.189%) SCM Performance Curve

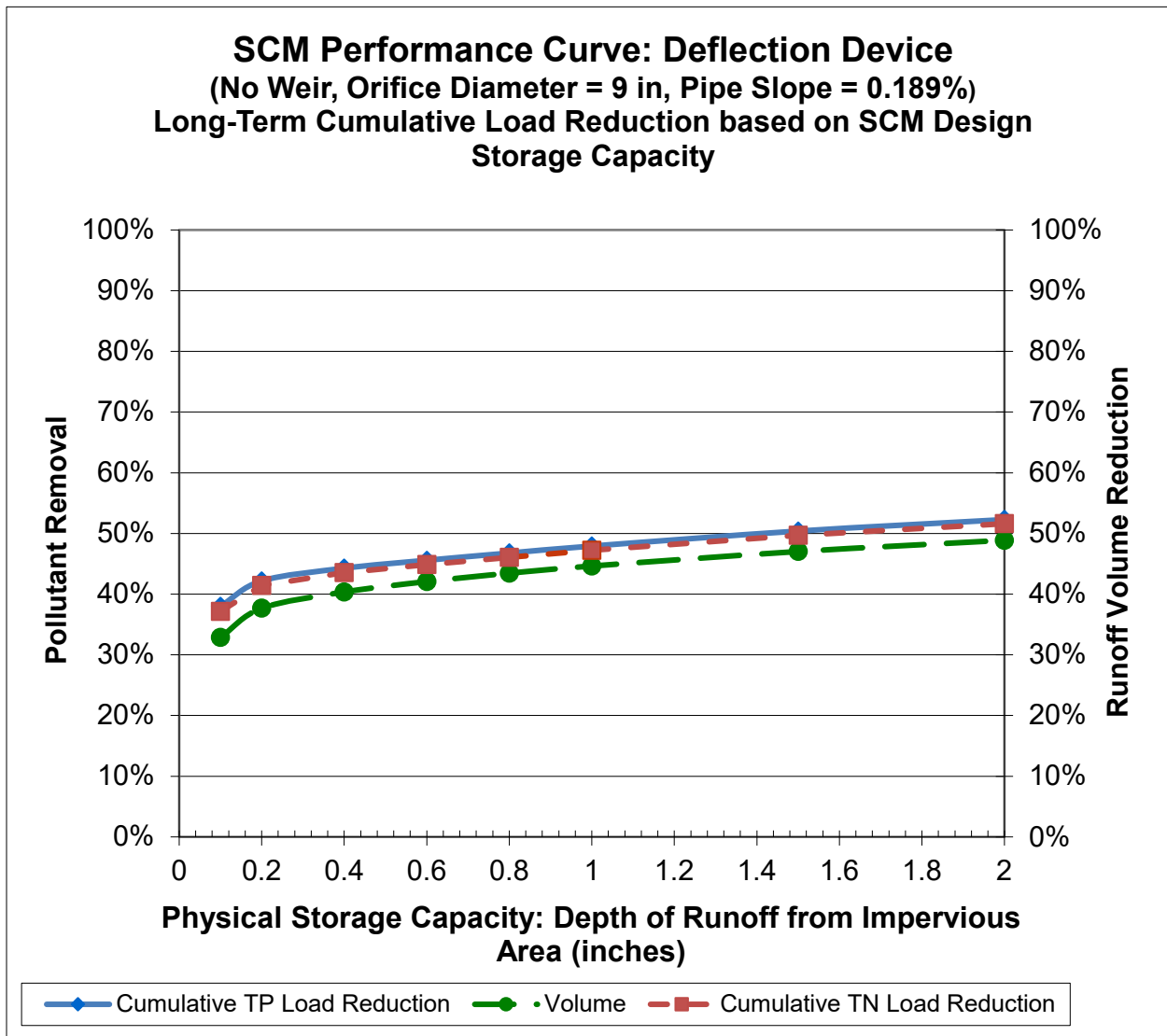


Table 15: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.5%) SCM Performance Table

Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.5%) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	26%	31%	33%	34%	35%	36%	38%	39%
Cumulative Phosphorus Load Reduction	30%	34%	36%	37%	37%	38%	40%	42%
Cumulative Nitrogen Load Reduction	30%	34%	35%	36%	37%	38%	40%	41%

Figure 15: Deflection Device (No Weir, Orifice Diameter = 9 in, Pipe Slope = 0.5%) SCM Performance Curve

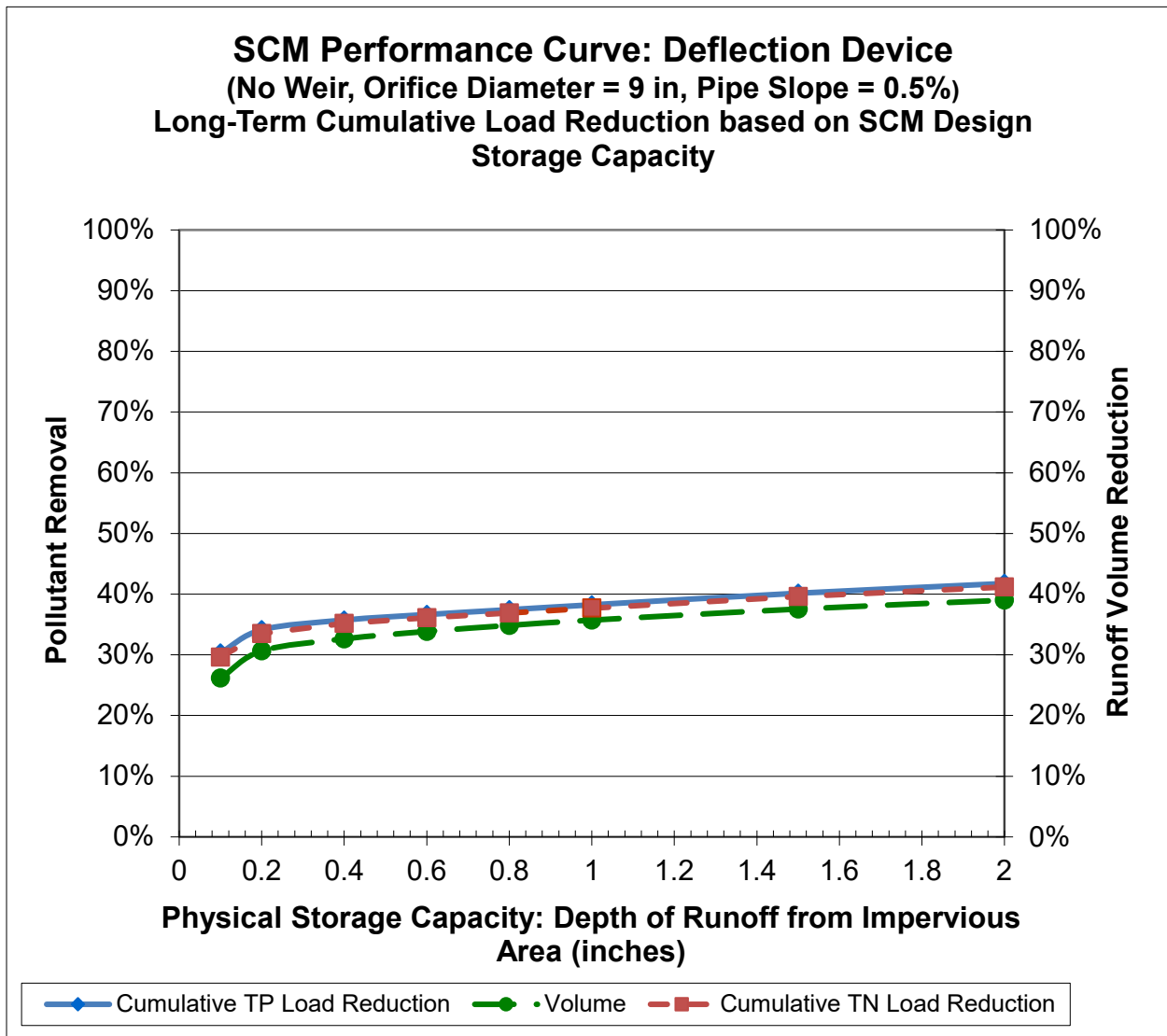


Table 16: Deflection Device (Orifice Diameter = 6 in, Weir Height = 0.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 0.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	32%	36%	41%	46%	50%	53%	61%	67%
Cumulative Phosphorus Load Reduction	41%	45%	49%	53%	57%	61%	70%	76%
Cumulative Nitrogen Load Reduction	40%	44%	48%	51%	56%	60%	68%	74%

Figure 16: Deflection Device (Orifice Diameter = 6 in, Weir Height = 0.5 ft) SCM Performance Curve

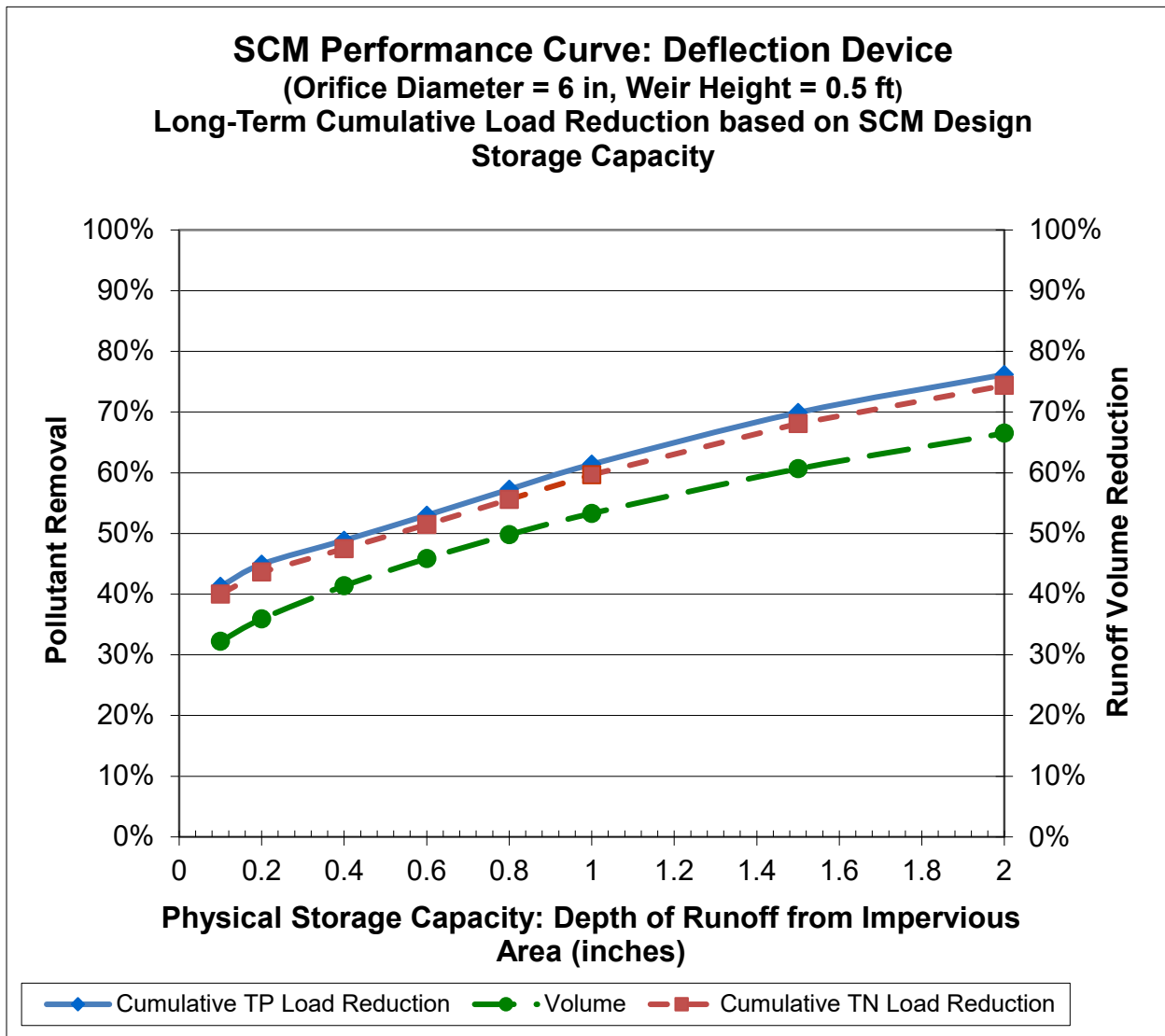


Table 17: Deflection Device (Orifice Diameter = 6 in, Weir Height = 1 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 1 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	41%	47%	55%	61%	67%	71%	79%	85%
Cumulative Phosphorus Load Reduction	52%	58%	64%	71%	76%	81%	88%	92%
Cumulative Nitrogen Load Reduction	50%	56%	63%	69%	74%	79%	86%	91%

Figure 17: Deflection Device (Orifice Diameter = 6 in, Weir Height = 1 ft) SCM Performance Curve

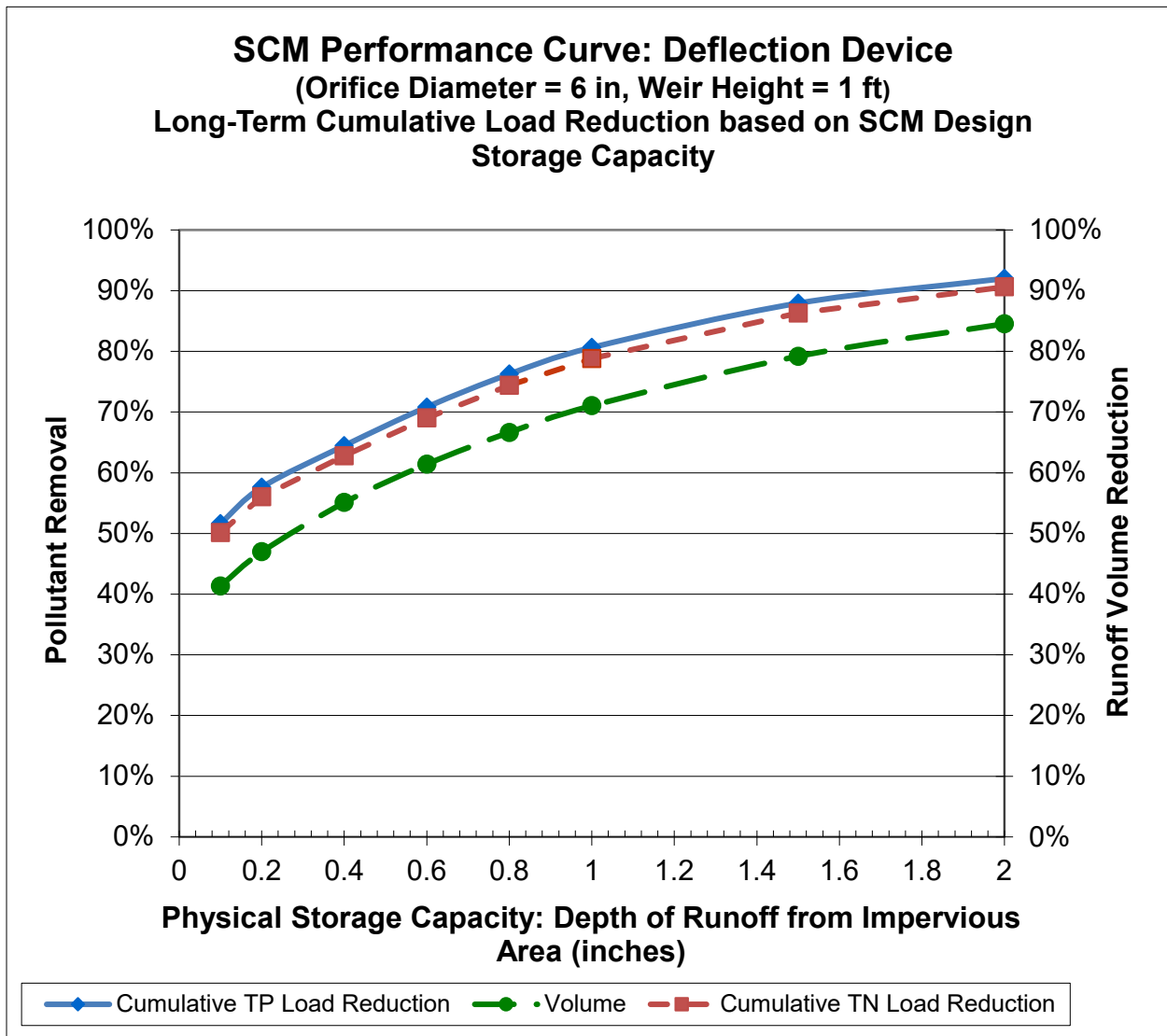


Table 18: Deflection Device (Orifice Diameter = 6 in, Weir Height = 1.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 1.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	47%	54%	63%	70%	76%	80%	87%	91%
Cumulative Phosphorus Load Reduction	58%	66%	74%	80%	85%	89%	94%	96%
Cumulative Nitrogen Load Reduction	57%	64%	72%	78%	83%	87%	92%	95%

Figure 18: Deflection Device (Orifice Diameter = 6 in, Weir Height = 1.5 ft) SCM Performance Curve

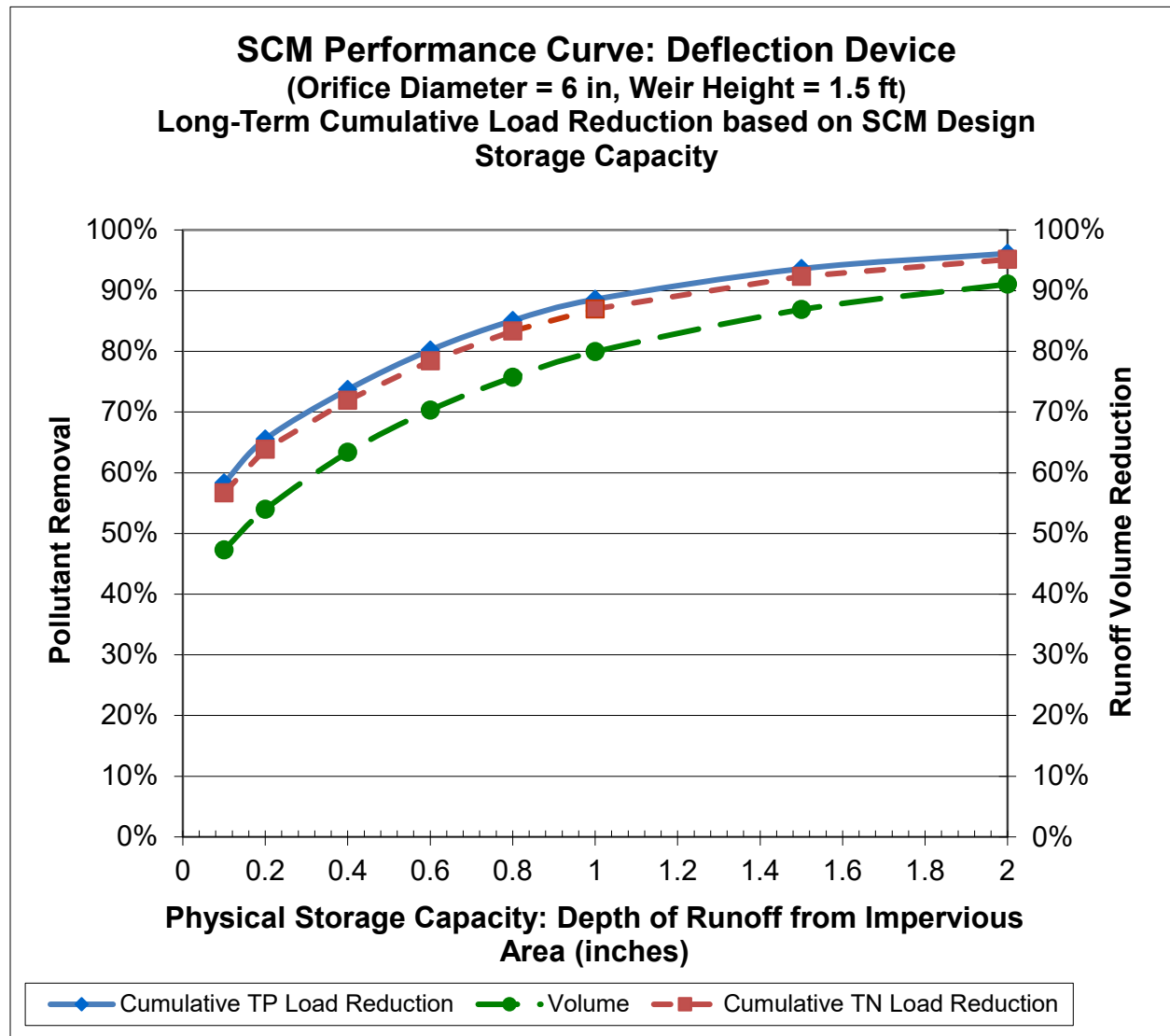


Table 19: Deflection Device (Orifice Diameter = 6 in, Weir Height = 2 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 2 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	52%	59%	69%	76%	81%	85%	91%	94%
Cumulative Phosphorus Load Reduction	63%	71%	80%	86%	90%	92%	96%	98%
Cumulative Nitrogen Load Reduction	61%	69%	78%	84%	88%	91%	95%	97%

Figure 19: Deflection Device (Orifice Diameter = 6 in, Weir Height = 2 ft) SCM Performance Curve

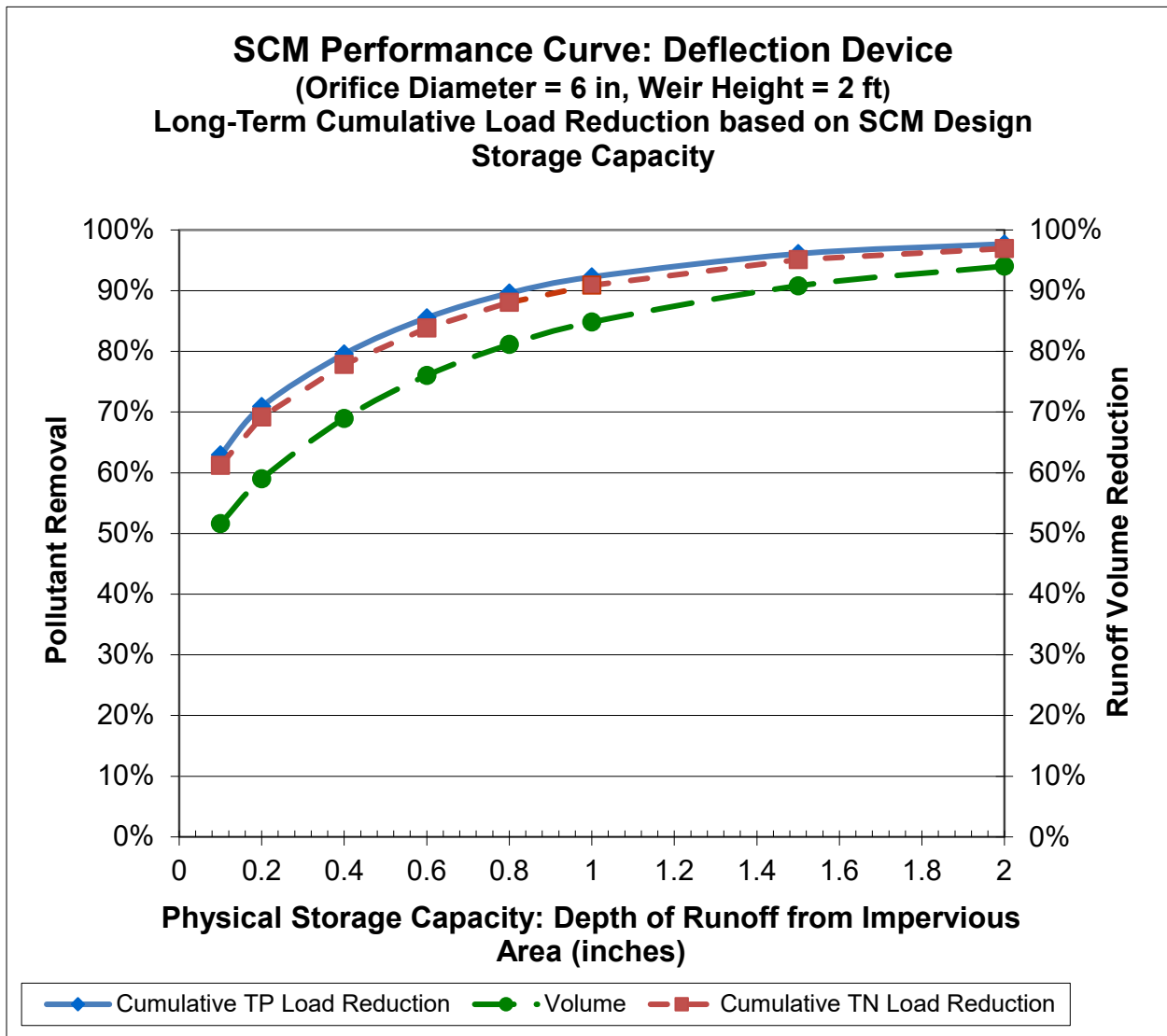


Table 20: Deflection Device (Orifice Diameter = 6 in, Weir Height = 2.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 2.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	55%	63%	73%	80%	84%	88%	93%	95%
Cumulative Phosphorus Load Reduction	66%	75%	84%	89%	92%	94%	97%	98%
Cumulative Nitrogen Load Reduction	64%	73%	82%	87%	91%	93%	96%	98%

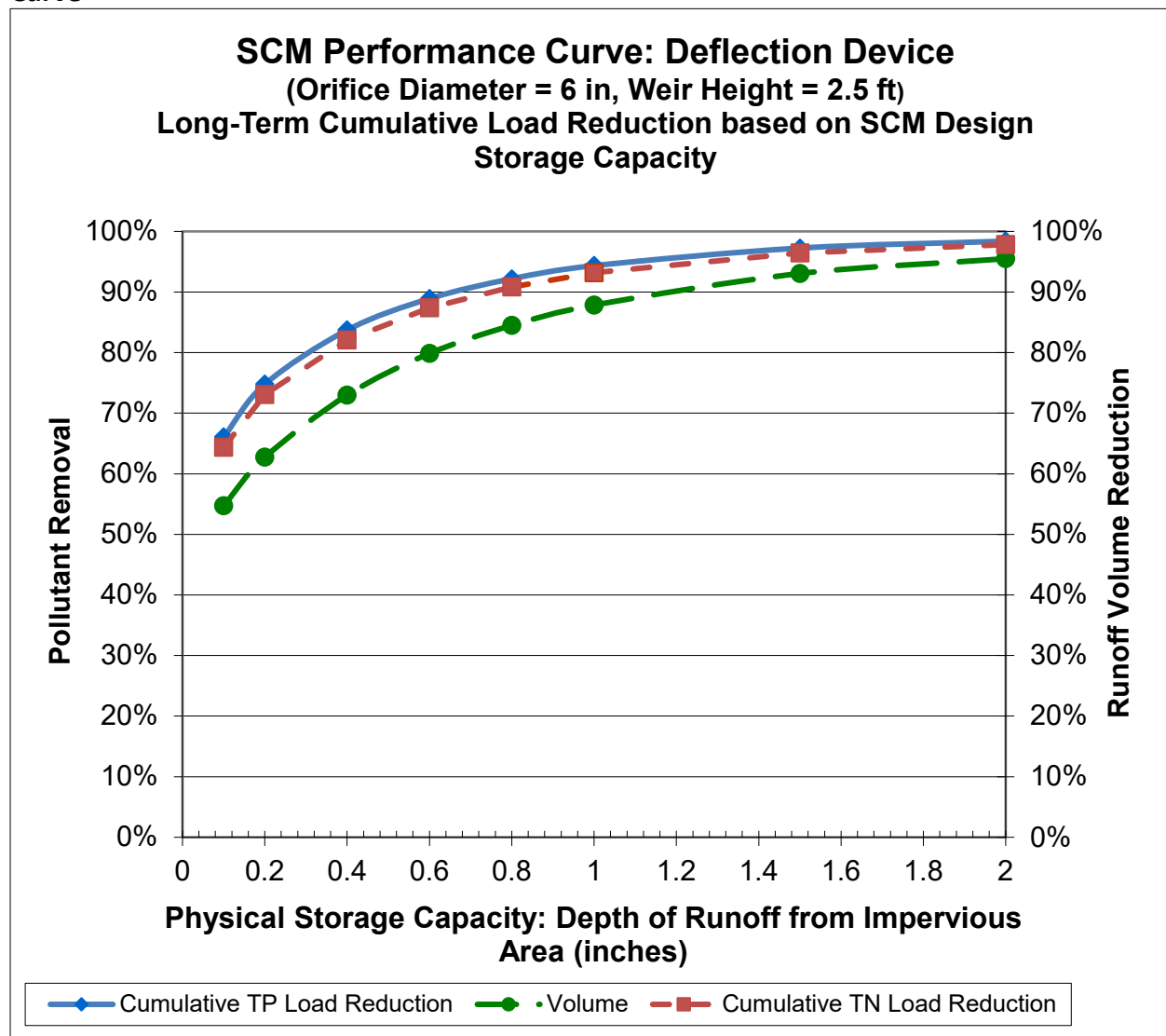
Figure 20: Deflection Device (Orifice Diameter = 6 in, Weir Height = 2.5 ft) SCM Performance Curve

Table 21: Deflection Device (Orifice Diameter = 6 in, Weir Height = 3 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 3 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	57%	65%	76%	82%	87%	90%	94%	96%
Cumulative Phosphorus Load Reduction	68%	78%	87%	91%	94%	96%	98%	99%
Cumulative Nitrogen Load Reduction	67%	76%	85%	90%	93%	95%	97%	98%

Figure 21: Deflection Device (Orifice Diameter = 6 in, Weir Height = 3 ft) SCM Performance Curve

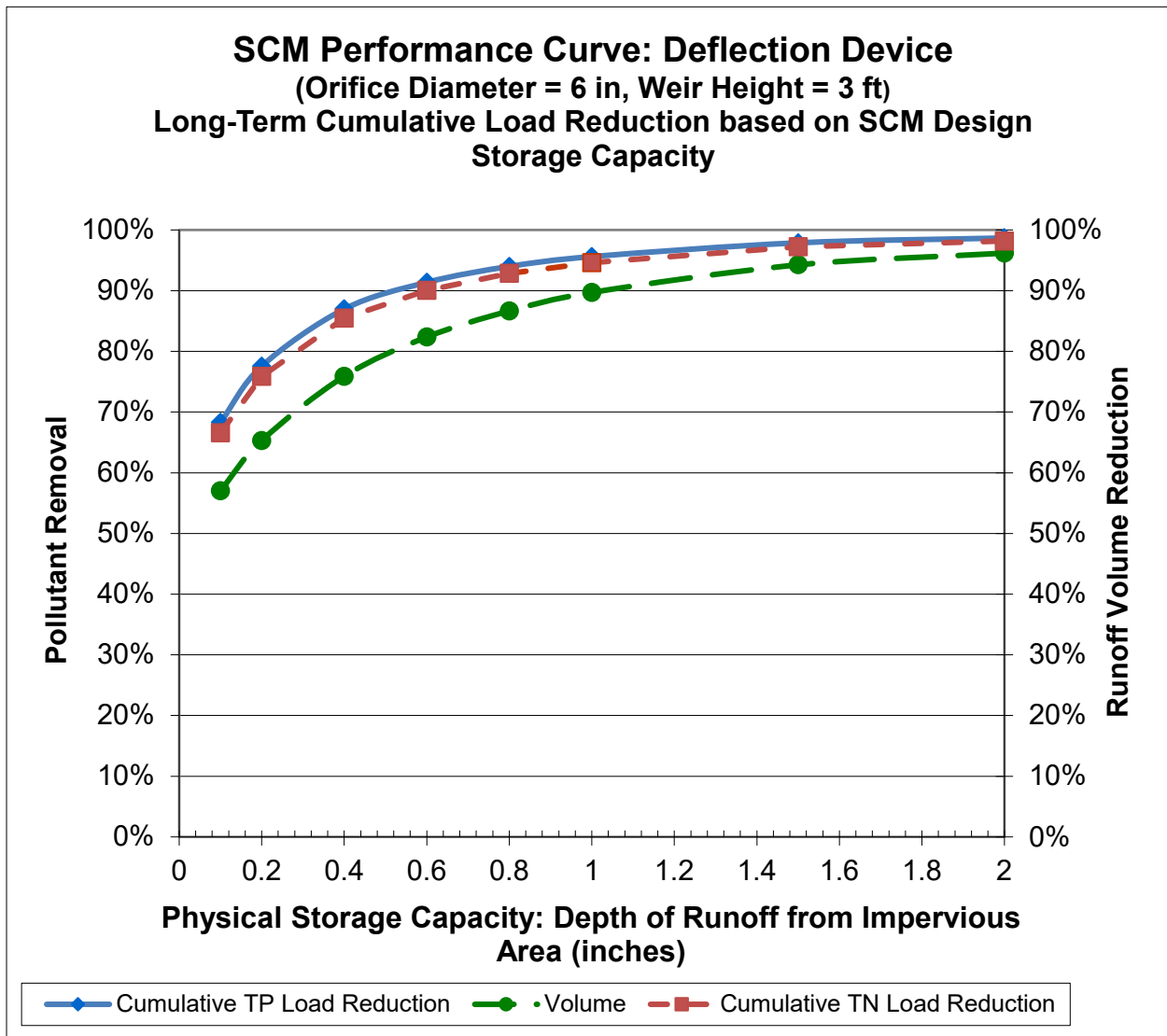


Table 22: Deflection Device (Orifice Diameter = 6 in, Weir Height = 3.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 3.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	62%	72%	80%	85%	88%	91%	95%	97%
Cumulative Phosphorus Load Reduction	72%	81%	89%	93%	95%	96%	98%	99%
Cumulative Nitrogen Load Reduction	71%	80%	87%	91%	94%	96%	98%	98%

Figure 22: Deflection Device (Orifice Diameter = 6 in, Weir Height = 3.5 ft) SCM Performance Curve

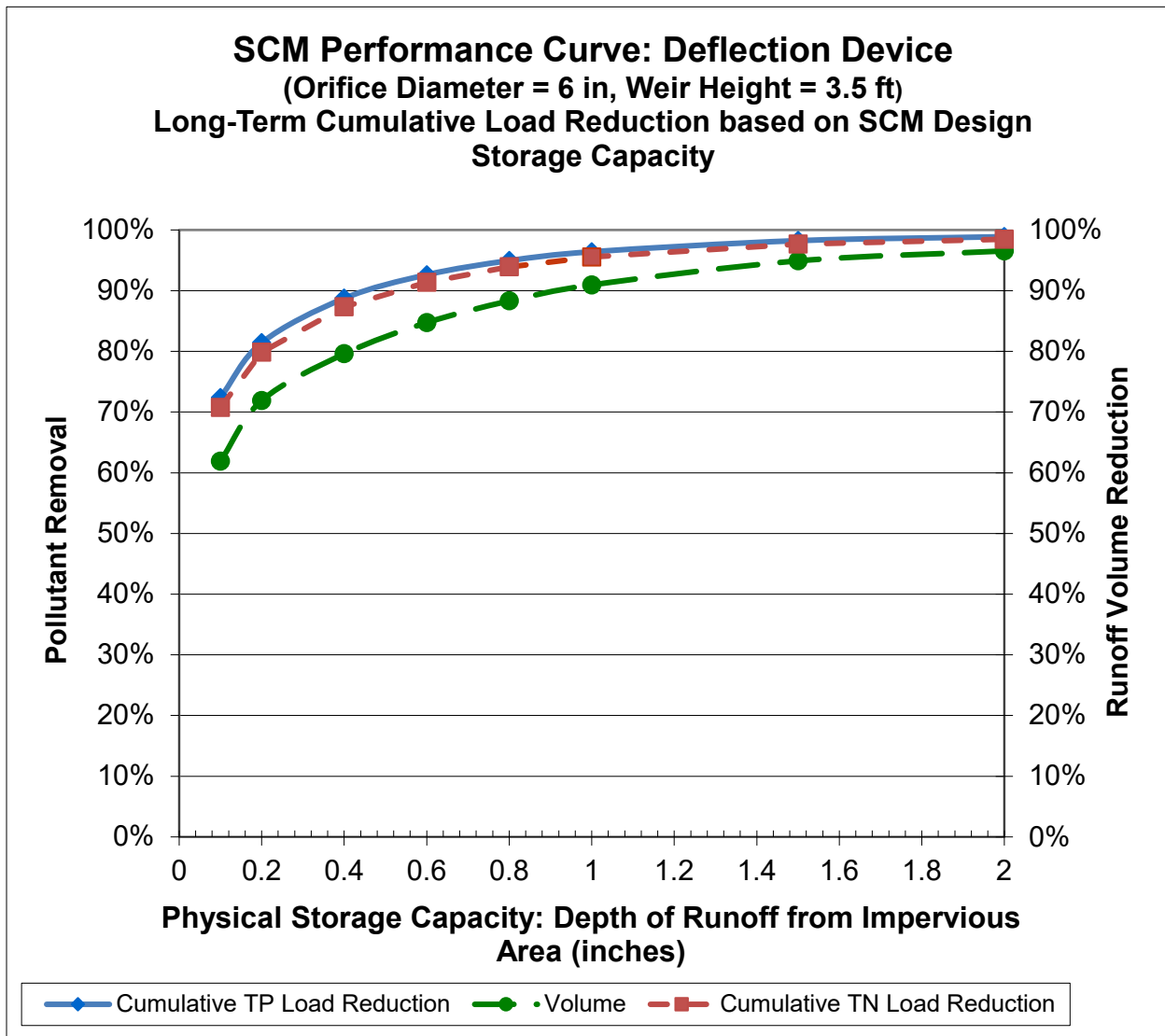


Table 23: Deflection Device (Orifice Diameter = 6 in, Weir Height = 4 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 6 in, Weir Height = 4 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	69%	85%	94%	96%	97%	98%	98%	99%
Cumulative Phosphorus Load Reduction	78%	92%	97%	98%	99%	99%	99%	100%
Cumulative Nitrogen Load Reduction	77%	90%	96%	98%	98%	99%	99%	99%

Figure 23: Deflection Device (Orifice Diameter = 6 in, Weir Height = 4 ft) SCM Performance Curve

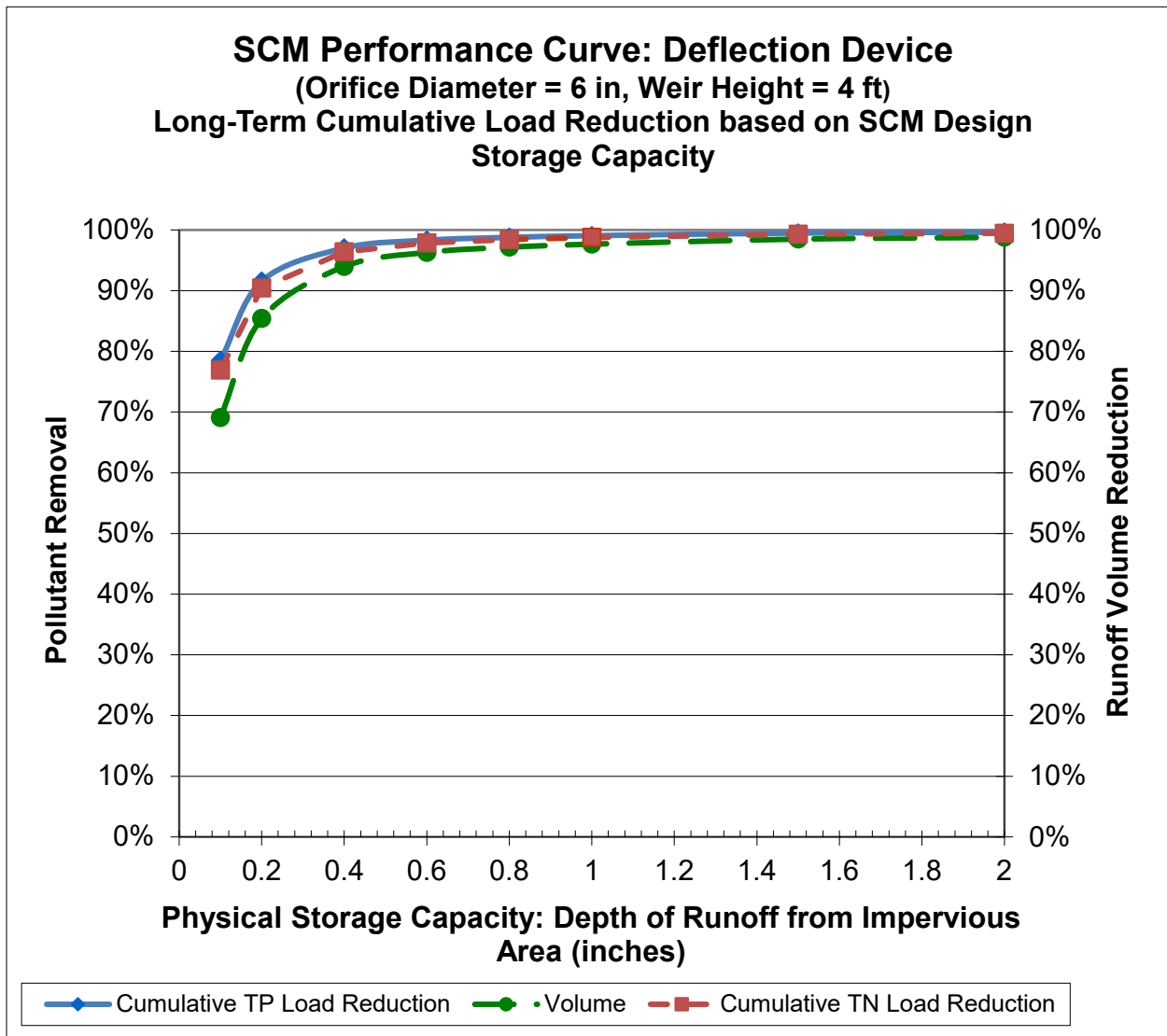


Table 24: Deflection Device (Orifice Diameter = 9 in, Weir Height = 0.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 0.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	49%	53%	58%	61%	64%	67%	73%	77%
Cumulative Phosphorus Load Reduction	59%	63%	67%	69%	72%	75%	81%	85%
Cumulative Nitrogen Load Reduction	57%	62%	65%	68%	71%	74%	79%	84%

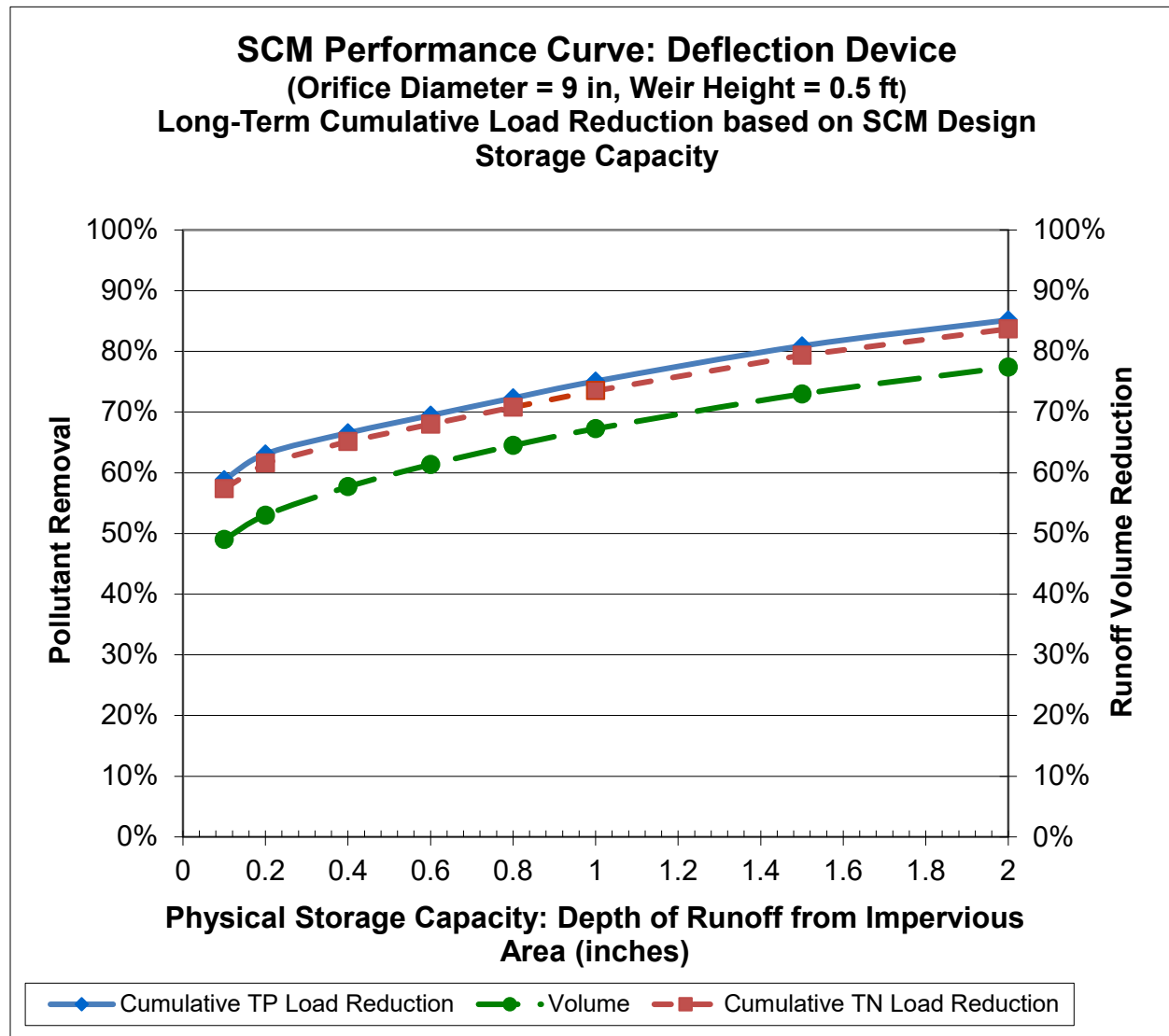
Figure 24: Deflection Device (Orifice Diameter = 9 in, Weir Height = 0.5 ft) SCM Performance Curve

Table 25: Deflection Device (Orifice Diameter = 9 in, Weir Height = 1 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 1 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	60%	66%	72%	77%	80%	83%	88%	91%
Cumulative Phosphorus Load Reduction	71%	76%	82%	85%	88%	90%	94%	96%
Cumulative Nitrogen Load Reduction	69%	75%	80%	84%	87%	89%	93%	95%

Figure 25: Deflection Device (Orifice Diameter = 9 in, Weir Height = 1 ft) SCM Performance Curve

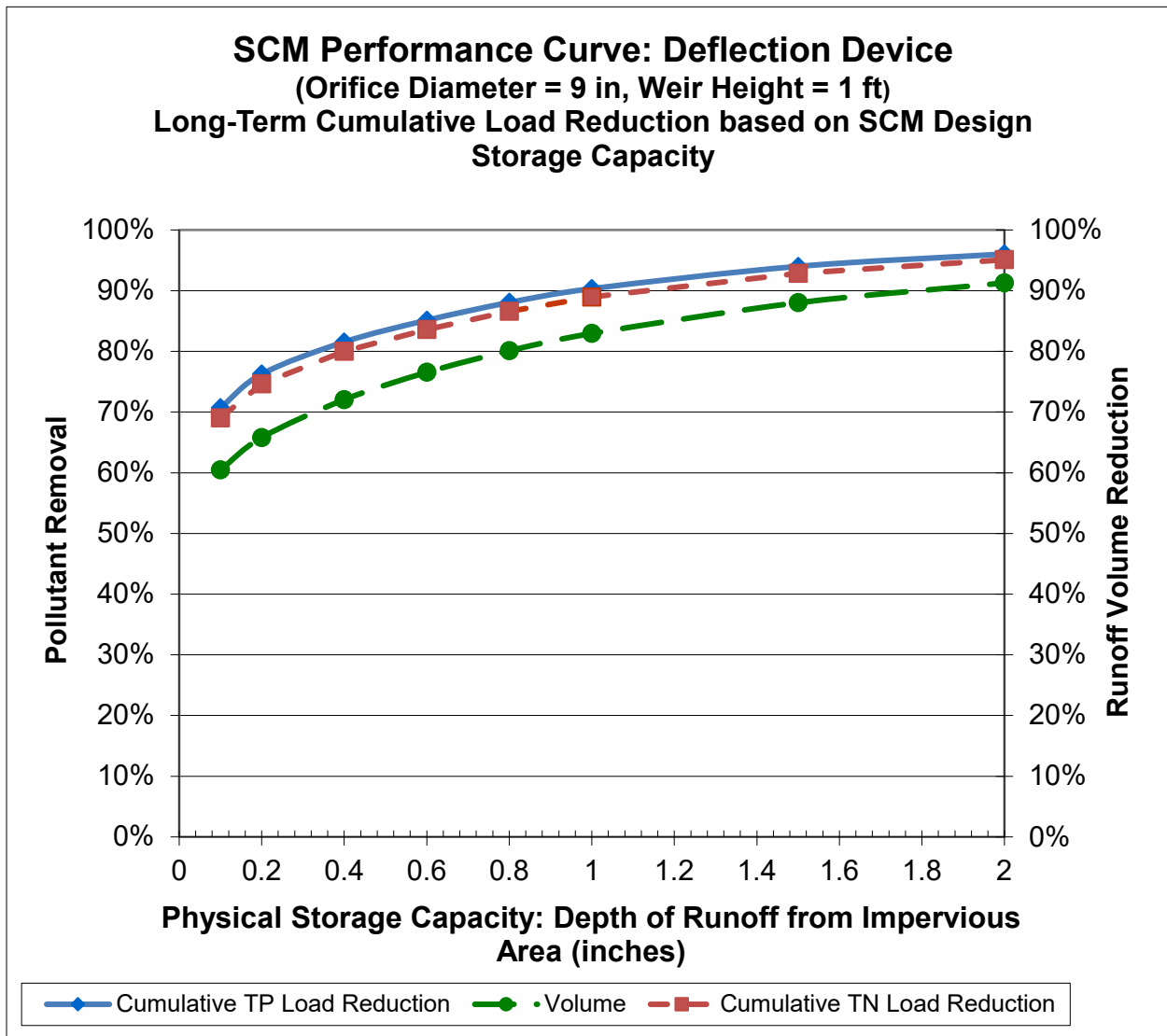


Table 26: Deflection Device (Orifice Diameter = 9 in, Weir Height = 1.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 1.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	66%	72%	79%	83%	87%	89%	93%	95%
Cumulative Phosphorus Load Reduction	76%	82%	88%	91%	93%	95%	97%	98%
Cumulative Nitrogen Load Reduction	74%	81%	86%	90%	92%	94%	96%	98%

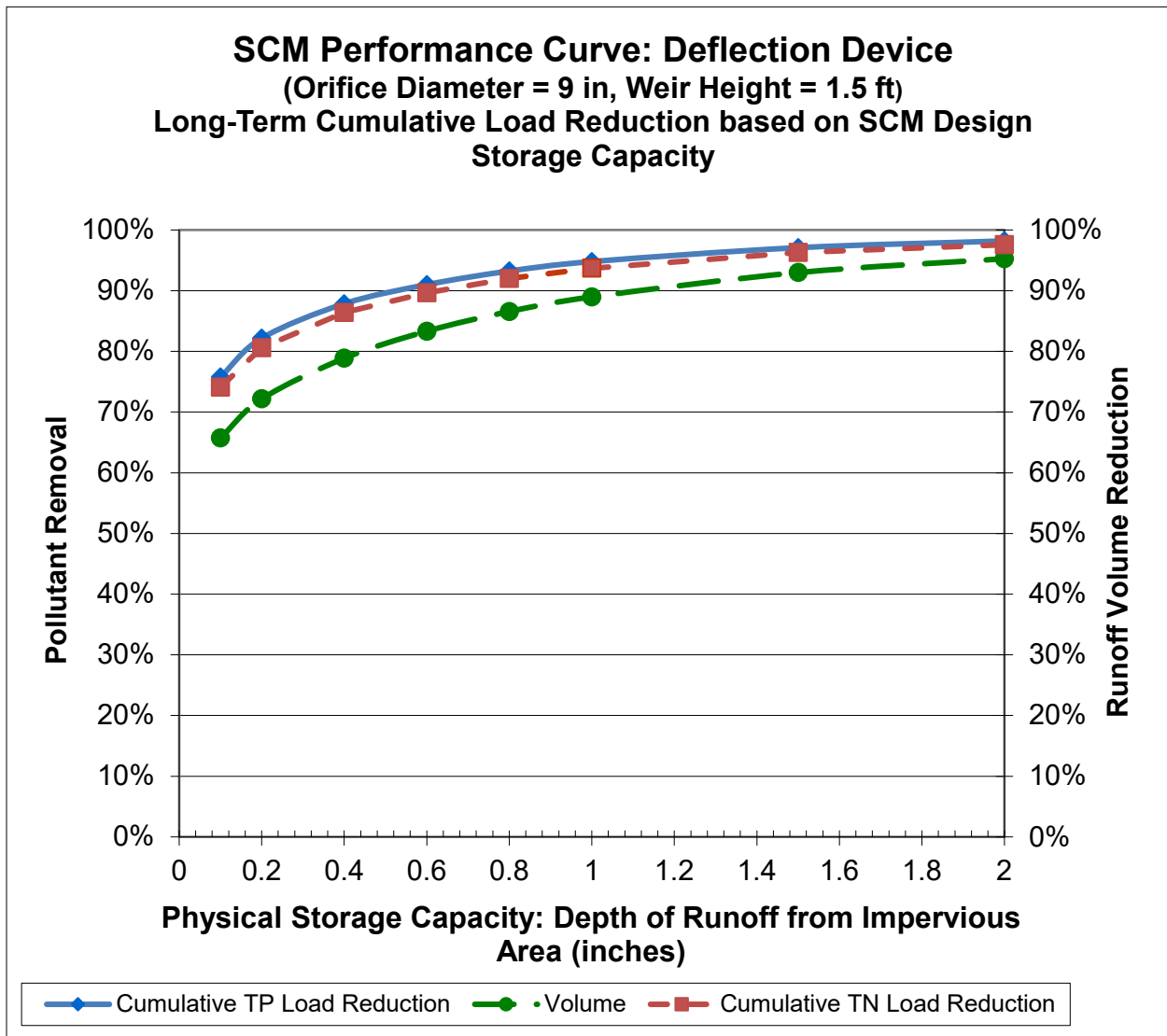
Figure 26: Deflection Device (Orifice Diameter = 9 in, Weir Height = 1.5 ft) SCM Performance Curve

Table 27: Deflection Device (Orifice Diameter = 9 in, Weir Height = 2 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 2 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	68%	76%	83%	87%	90%	92%	95%	97%
Cumulative Phosphorus Load Reduction	78%	86%	91%	94%	96%	97%	98%	99%
Cumulative Nitrogen Load Reduction	77%	84%	90%	93%	95%	96%	98%	98%

Figure 27: Deflection Device (Orifice Diameter = 9 in, Weir Height = 2 ft) SCM Performance Curve

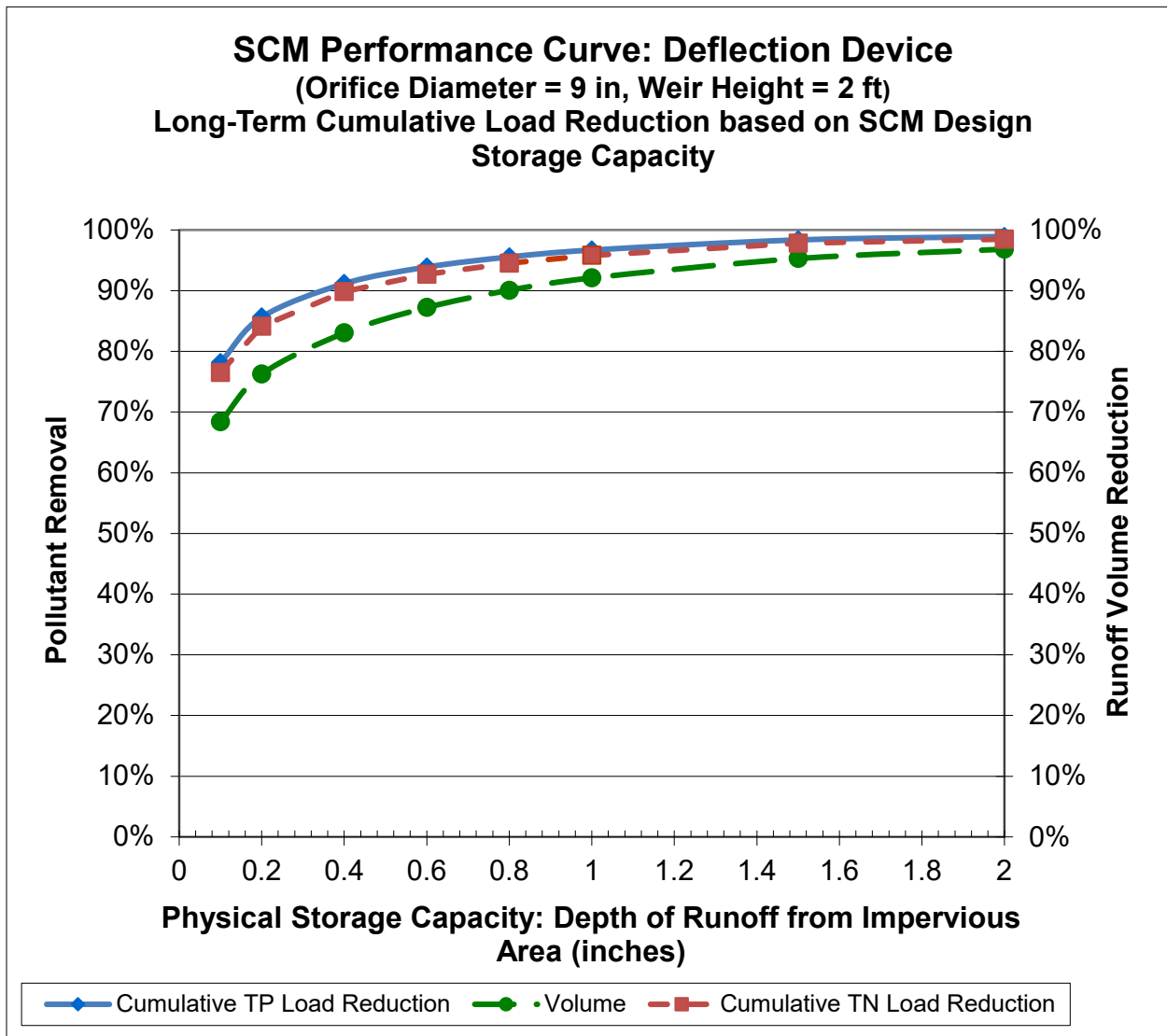


Table 28: Deflection Device (Orifice Diameter = 9 in, Weir Height = 2.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 2.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	69%	79%	86%	90%	92%	94%	96%	98%
Cumulative Phosphorus Load Reduction	79%	88%	93%	96%	97%	98%	99%	99%
Cumulative Nitrogen Load Reduction	77%	86%	92%	95%	96%	97%	98%	99%

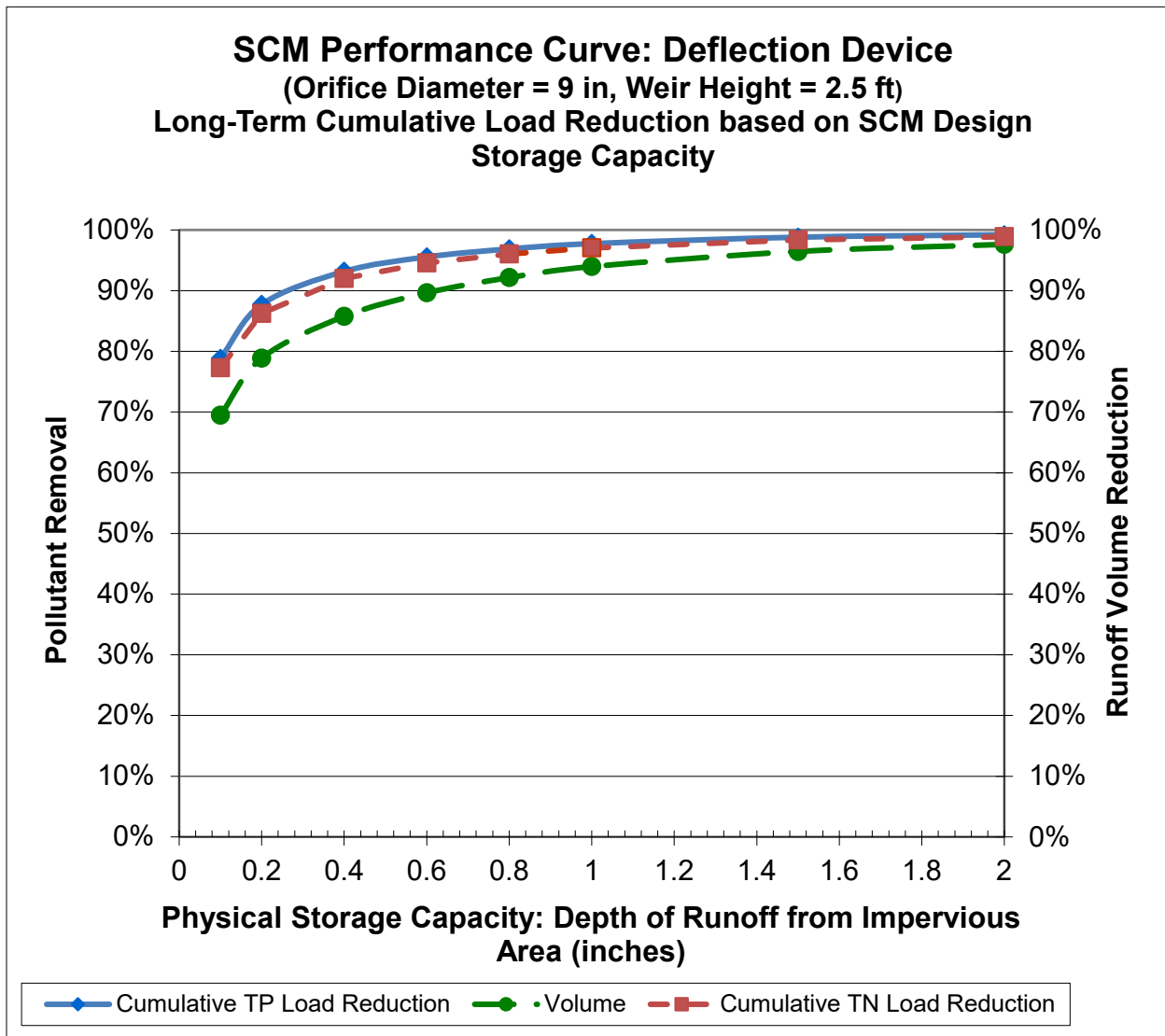
Figure 28: Deflection Device (Orifice Diameter = 9 in, Weir Height = 2.5 ft) SCM Performance Curve

Table 29: Deflection Device (Orifice Diameter = 9 in, Weir Height = 3 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 3 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	81%	88%	91%	93%	95%	97%	98%
Cumulative Phosphorus Load Reduction	79%	89%	94%	97%	98%	98%	99%	99%
Cumulative Nitrogen Load Reduction	77%	88%	93%	96%	97%	98%	99%	99%

Figure 29: Deflection Device (Orifice Diameter = 9 in, Weir Height = 3 ft) SCM Performance Curve

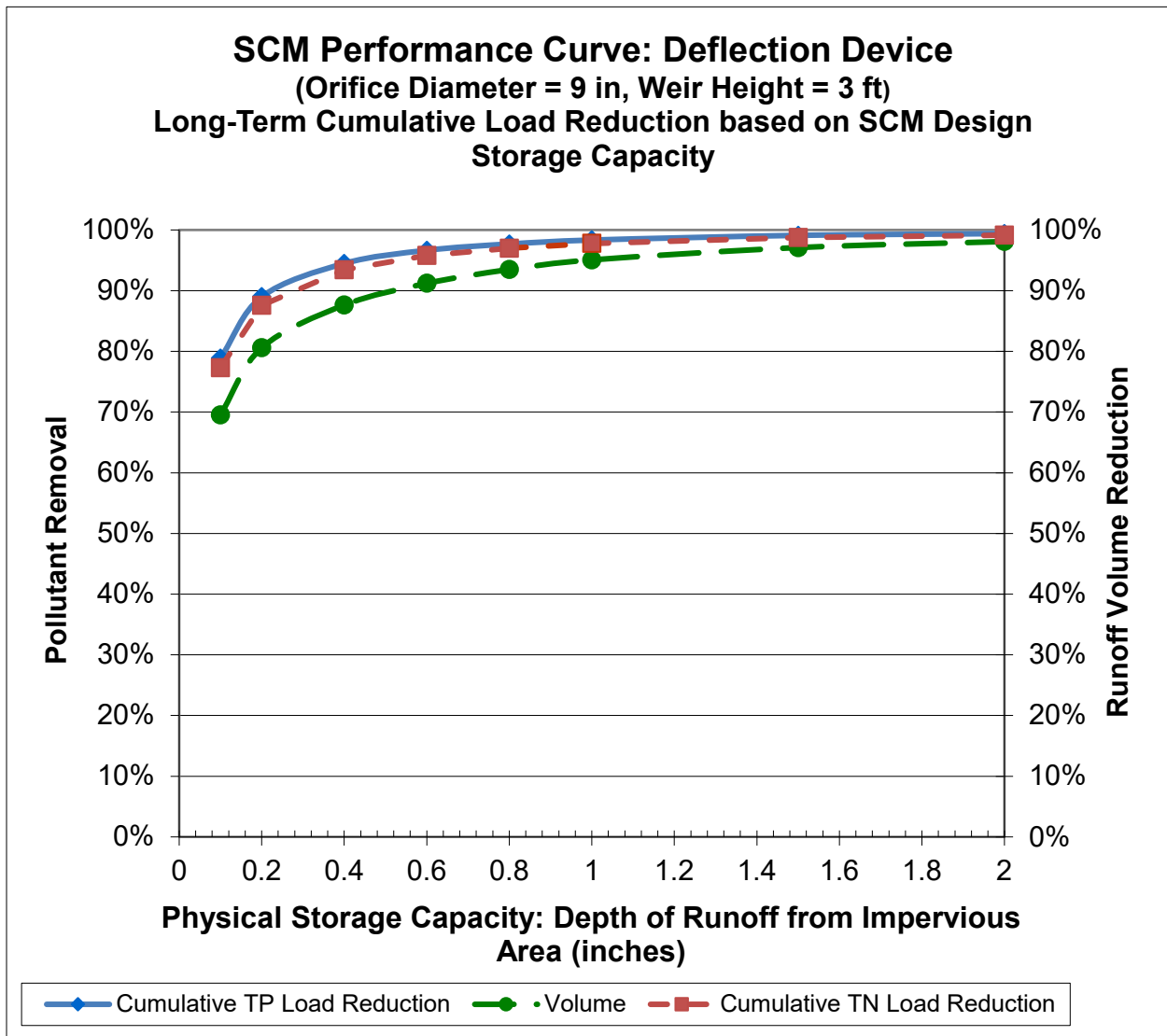


Table 30: Deflection Device (Orifice Diameter = 9 in, Weir Height = 3.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 3.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	83%	90%	93%	95%	96%	98%	98%
Cumulative Phosphorus Load Reduction	79%	90%	95%	97%	98%	99%	99%	99%
Cumulative Nitrogen Load Reduction	77%	89%	94%	96%	97%	98%	99%	99%

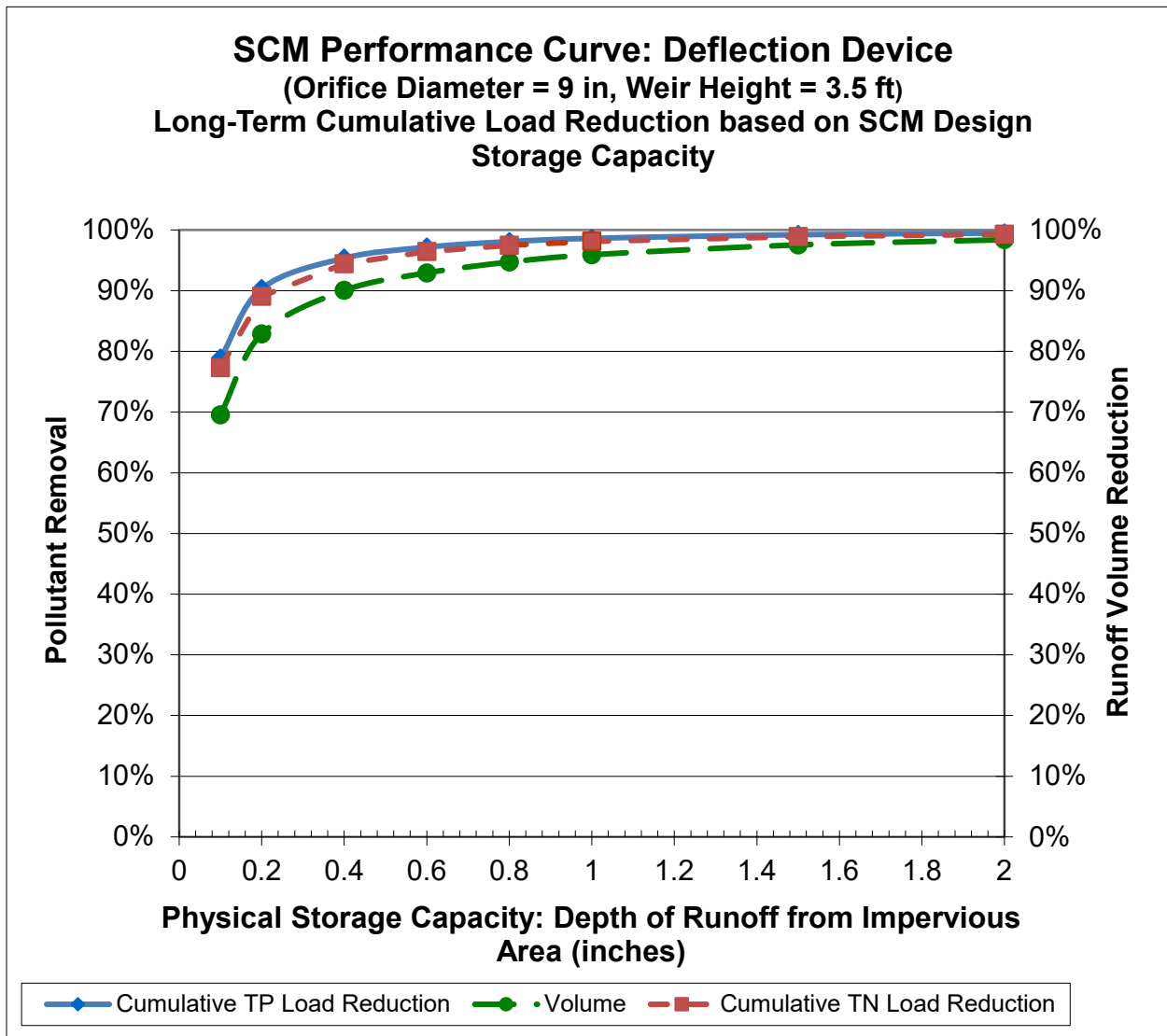
Figure 30: Deflection Device (Orifice Diameter = 9 in, Weir Height = 3.5 ft) SCM Performance Curve

Table 31: Deflection Device (Orifice Diameter = 9 in, Weir Height = 4 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 9 in, Weir Height = 4 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	86%	95%	98%	99%	99%	99%	100%
Cumulative Phosphorus Load Reduction	79%	92%	98%	99%	99%	100%	100%	100%
Cumulative Nitrogen Load Reduction	77%	91%	97%	99%	99%	99%	100%	100%

Figure 31: Deflection Device (Orifice Diameter = 9 in, Weir Height = 4 ft) SCM Performance Curve

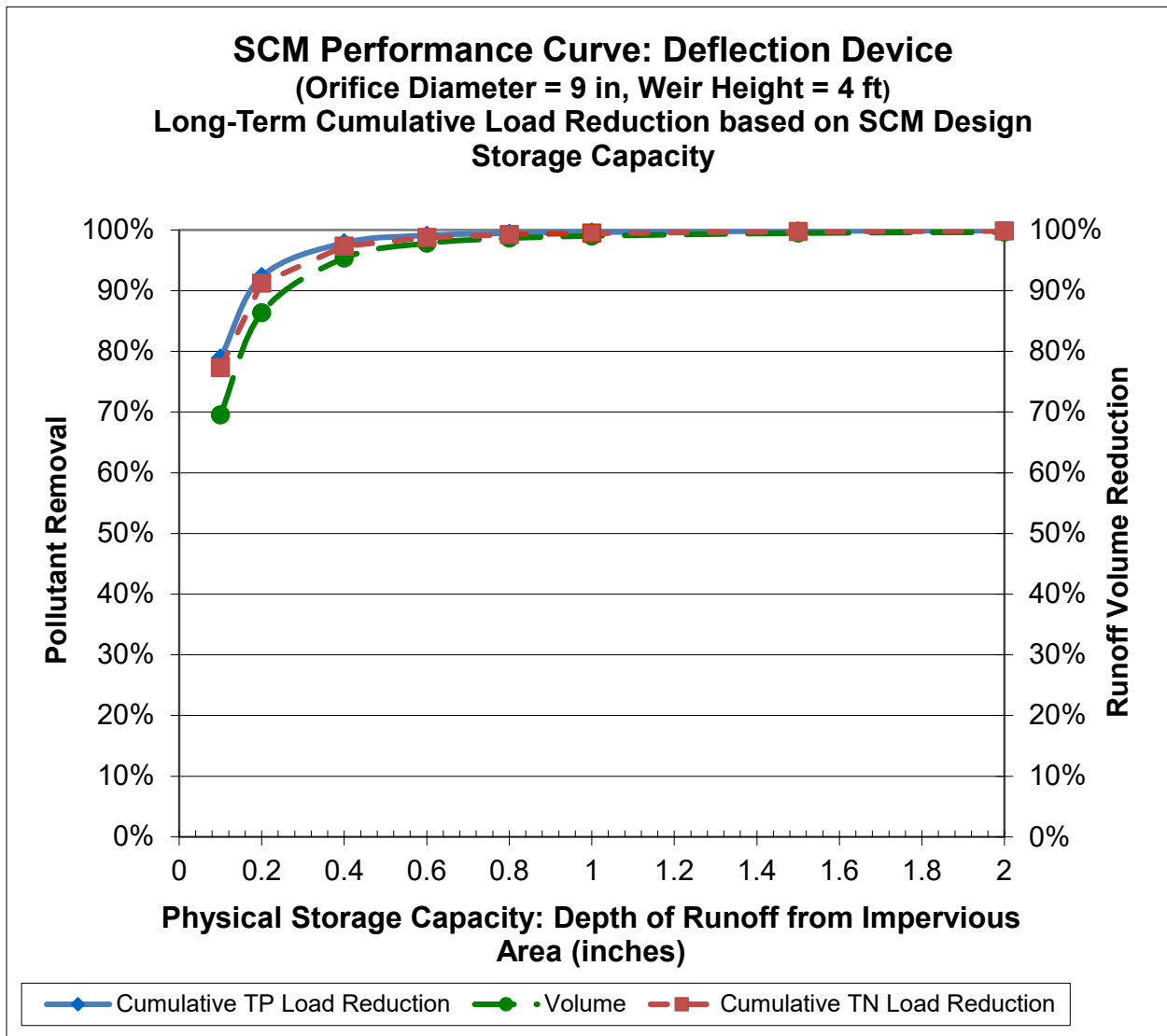


Table 32: Deflection Device (Orifice Diameter = 12 in, Weir Height = 0.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 0.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	56%	63%	68%	71%	73%	75%	80%	83%
Cumulative Phosphorus Load Reduction	66%	72%	76%	78%	80%	82%	86%	89%
Cumulative Nitrogen Load Reduction	64%	71%	75%	77%	79%	81%	85%	88%

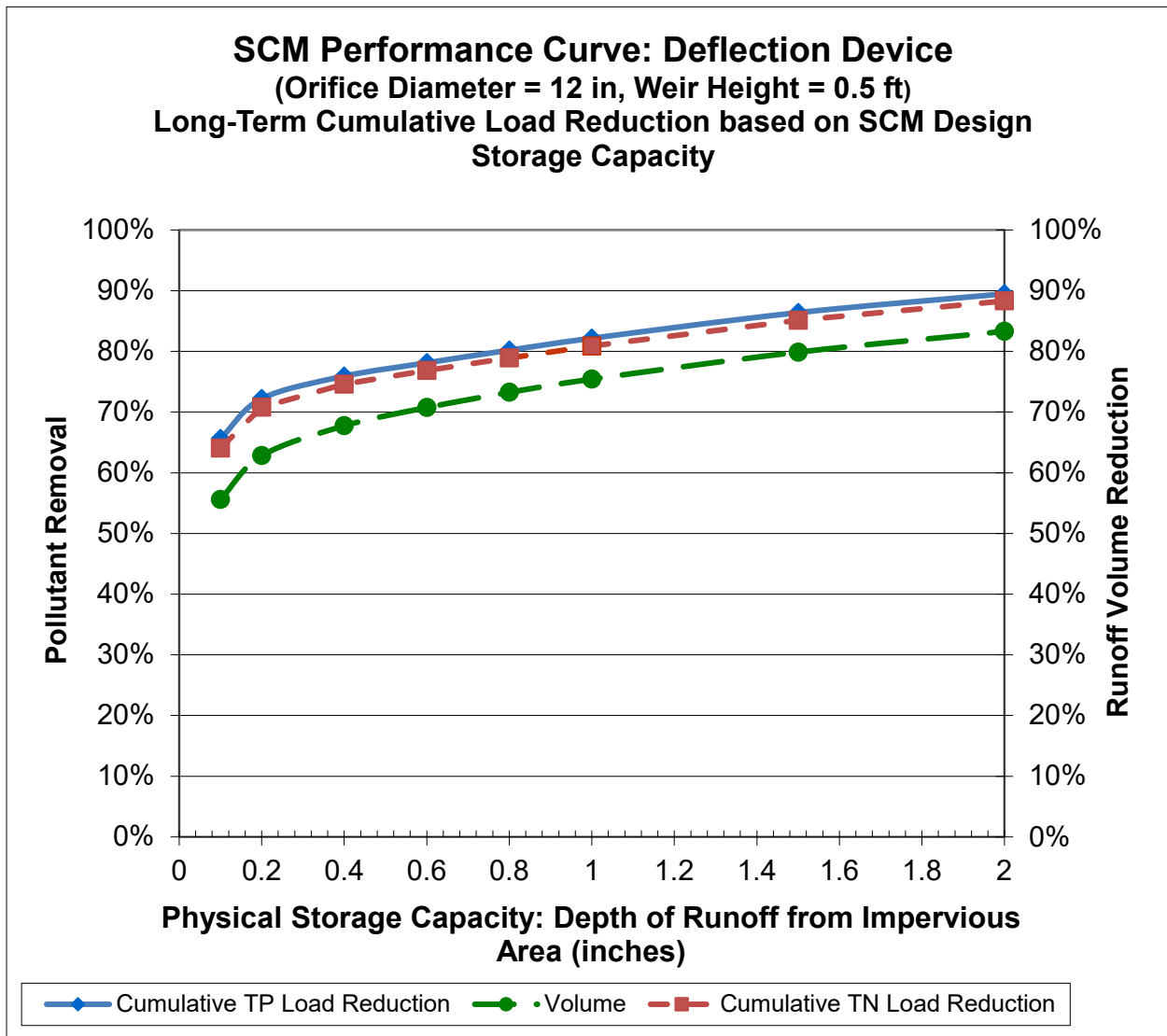
Figure 32: Deflection Device (Orifice Diameter = 12 in, Weir Height = 0.5 ft) SCM Performance Curve

Table 33: Deflection Device (Orifice Diameter = 12 in, Weir Height = 1 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 1 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	79%	83%	86%	88%	90%	93%	95%
Cumulative Phosphorus Load Reduction	79%	87%	91%	93%	94%	95%	97%	98%
Cumulative Nitrogen Load Reduction	77%	85%	89%	91%	93%	94%	96%	97%

Figure 33: Deflection Device (Orifice Diameter = 12 in, Weir Height = 1 ft) SCM Performance Curve

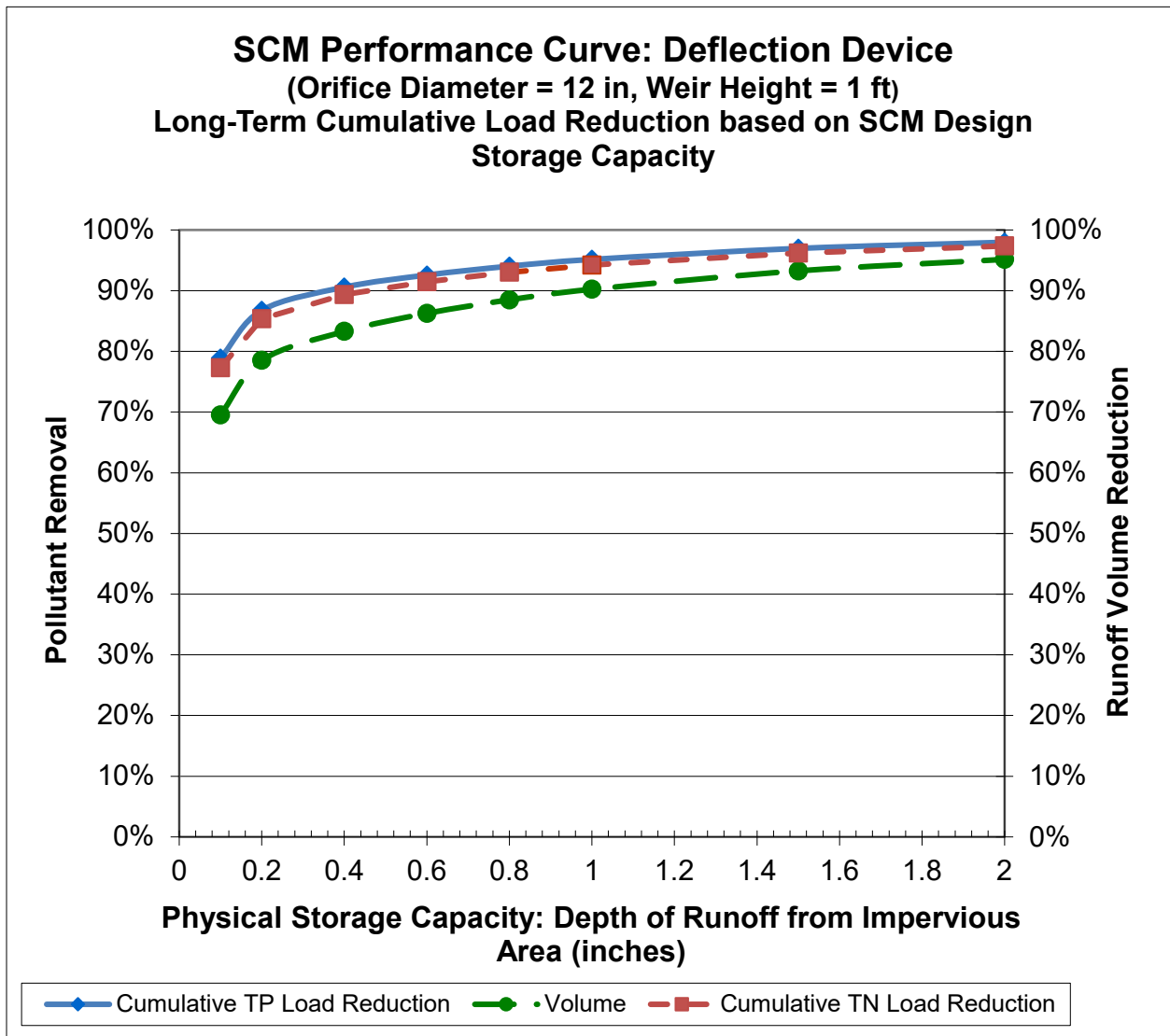


Table 34: Deflection Device (Orifice Diameter = 12 in, Weir Height = 1.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 1.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	83%	88%	91%	93%	94%	96%	98%
Cumulative Phosphorus Load Reduction	79%	90%	94%	96%	97%	98%	99%	99%
Cumulative Nitrogen Load Reduction	77%	89%	93%	95%	96%	97%	98%	99%

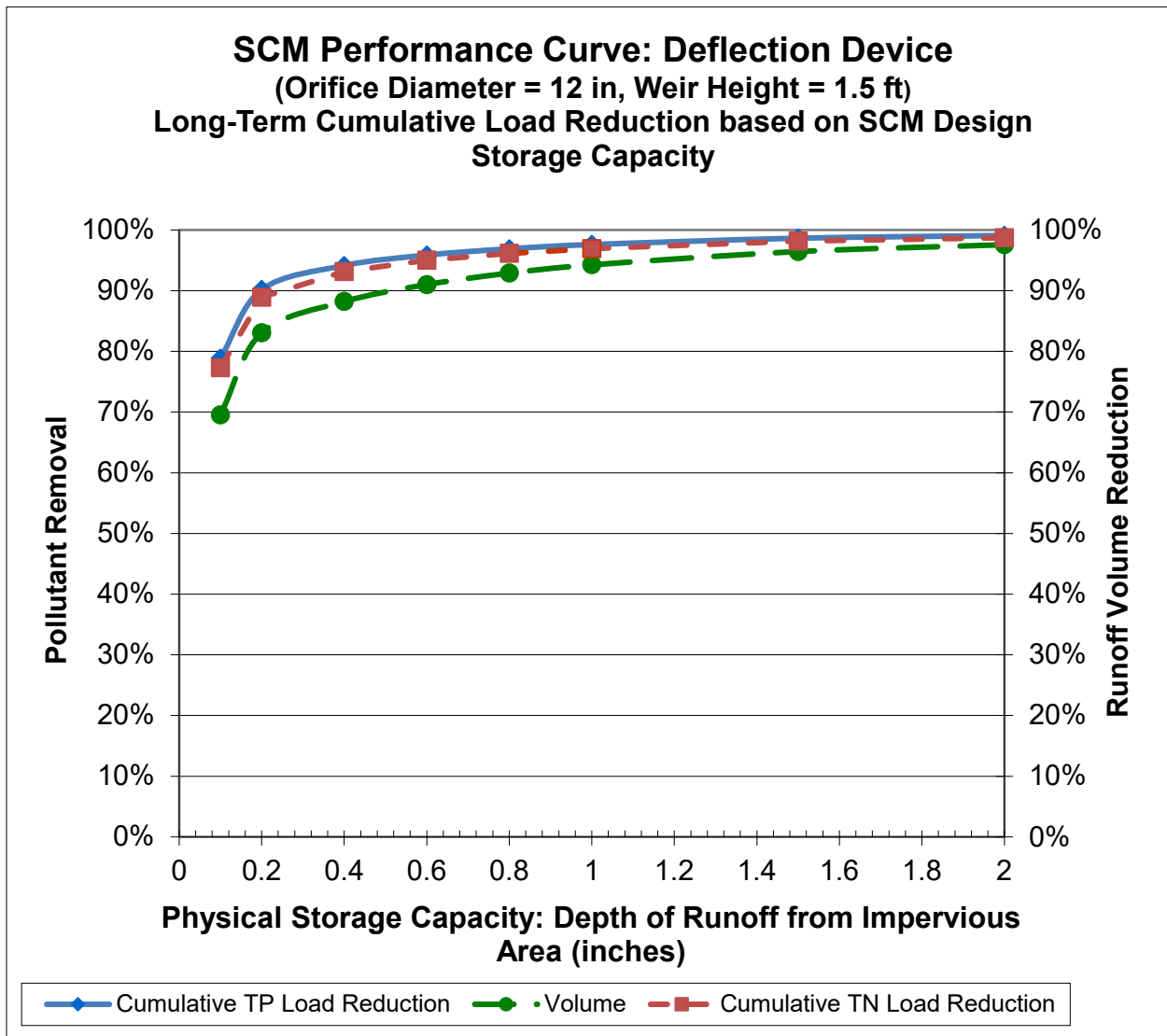
Figure 34: Deflection Device (Orifice Diameter = 12 in, Weir Height = 1.5 ft) SCM Performance Curve

Table 35: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 2 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	85%	91%	93%	95%	96%	98%	98%
Cumulative Phosphorus Load Reduction	79%	92%	96%	97%	98%	99%	99%	99%
Cumulative Nitrogen Load Reduction	77%	91%	95%	97%	97%	98%	99%	99%

Figure 35: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2 ft) SCM Performance Curve

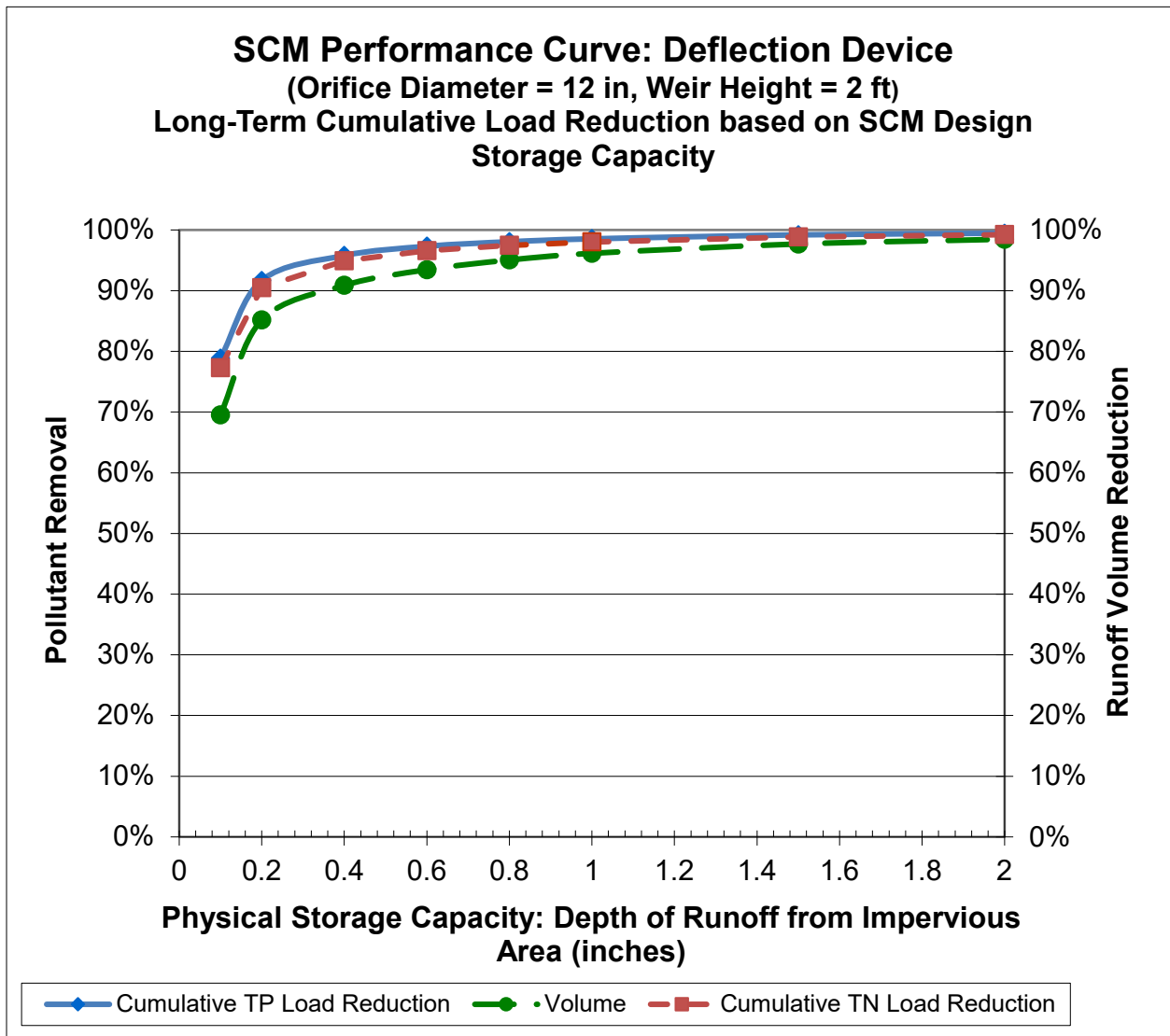


Table 36: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 2.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	86%	92%	95%	96%	97%	98%	99%
Cumulative Phosphorus Load Reduction	79%	92%	97%	98%	99%	99%	99%	100%
Cumulative Nitrogen Load Reduction	77%	91%	96%	97%	98%	99%	99%	100%

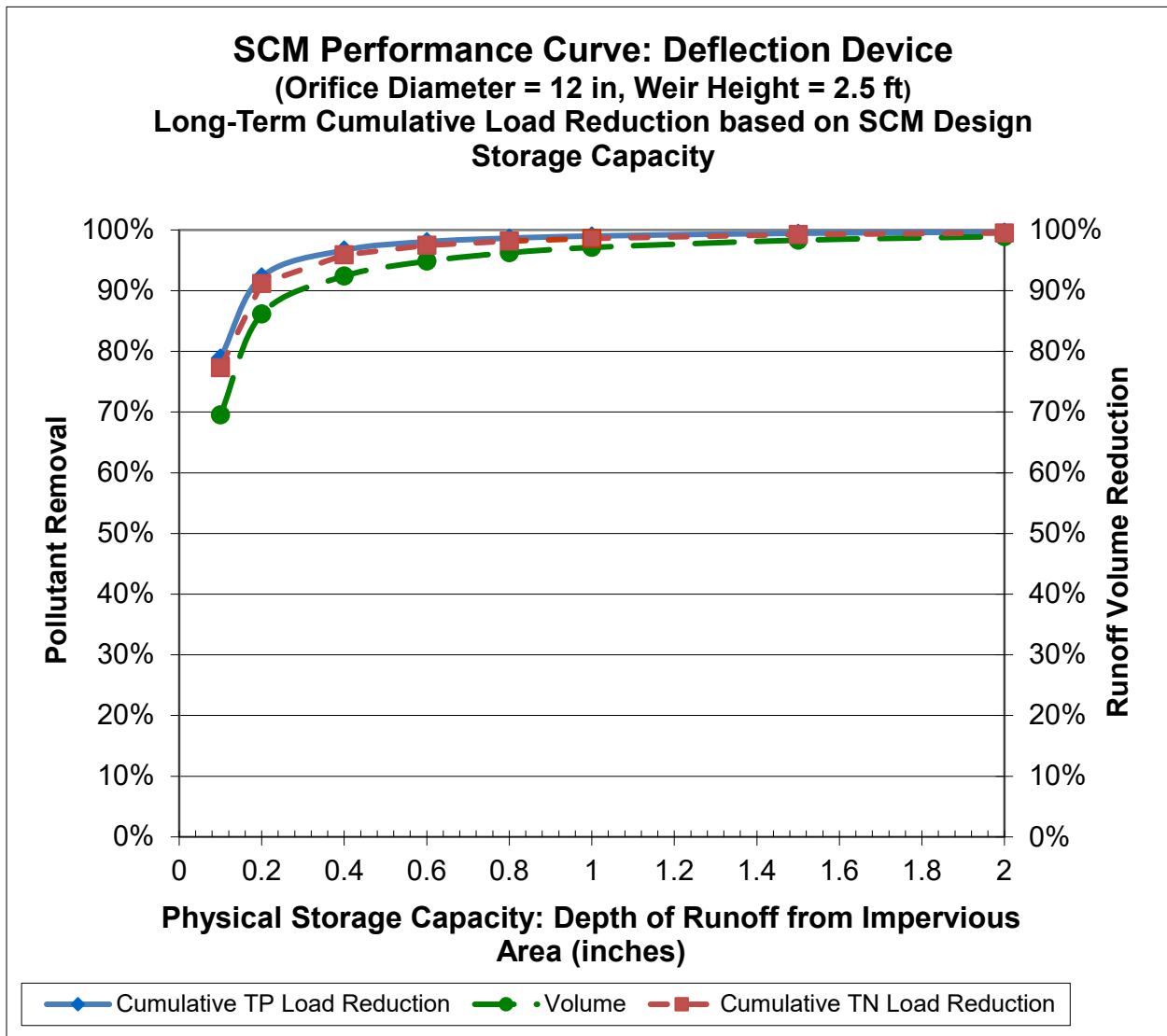
Figure 36: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2.5 ft) SCM Performance Curve

Table 37: Deflection Device (Orifice Diameter = 12 in, Weir Height = 3 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 12 in, Weir Height = 3 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	87%	93%	96%	97%	98%	99%	99%
Cumulative Phosphorus Load Reduction	79%	92%	97%	98%	99%	99%	100%	100%
Cumulative Nitrogen Load Reduction	77%	91%	96%	98%	99%	99%	99%	100%

Figure 37: Deflection Device (Orifice Diameter = 12 in, Weir Height = 3 ft) SCM Performance Curve

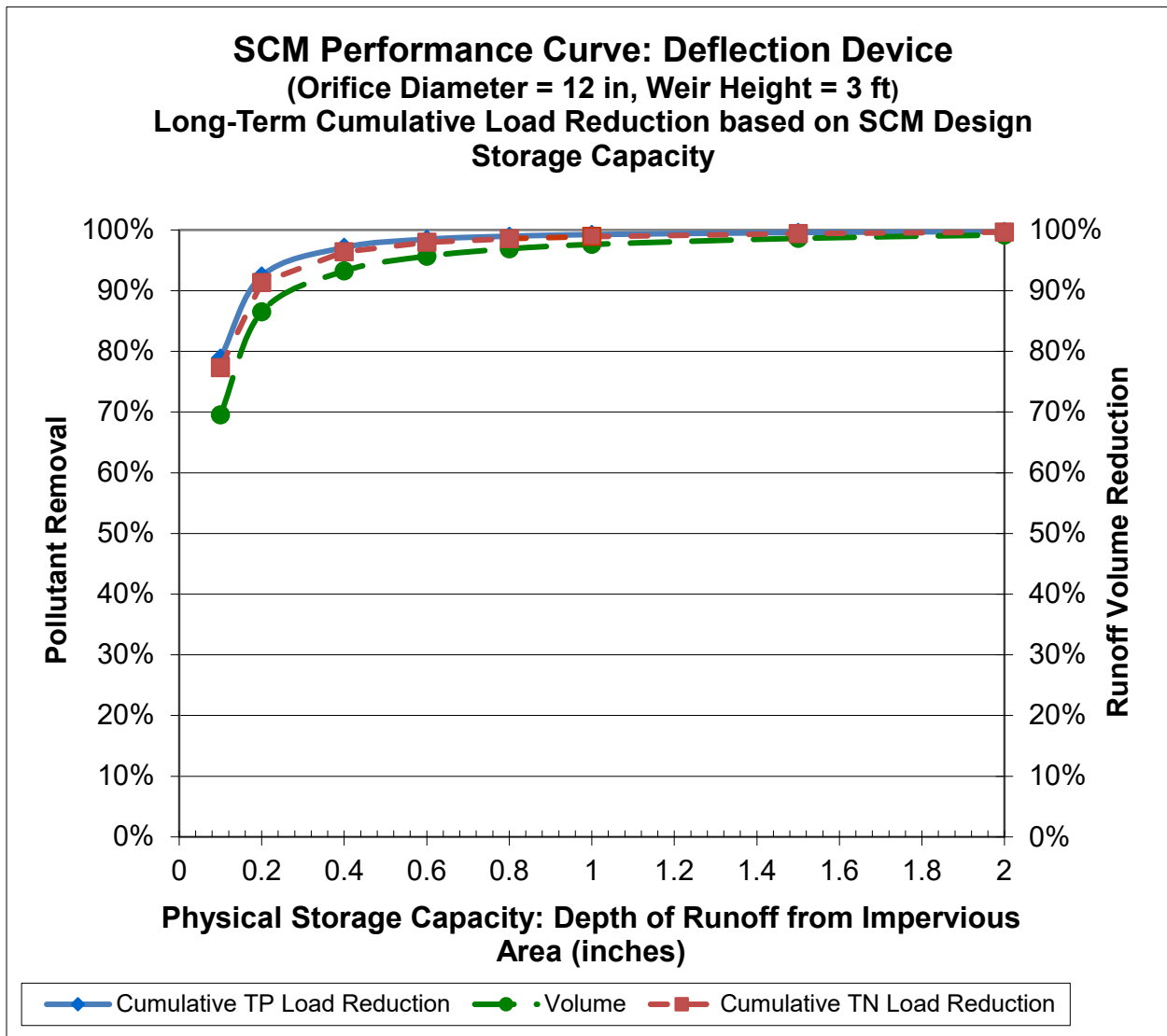


Table 38: Deflection Device (Orifice Diameter = 15 in, Weir Height = 0.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 15 in, Weir Height = 0.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	60%	68%	74%	77%	79%	81%	84%	87%
Cumulative Phosphorus Load Reduction	70%	77%	81%	83%	85%	87%	90%	92%
Cumulative Nitrogen Load Reduction	69%	76%	80%	82%	84%	85%	89%	91%

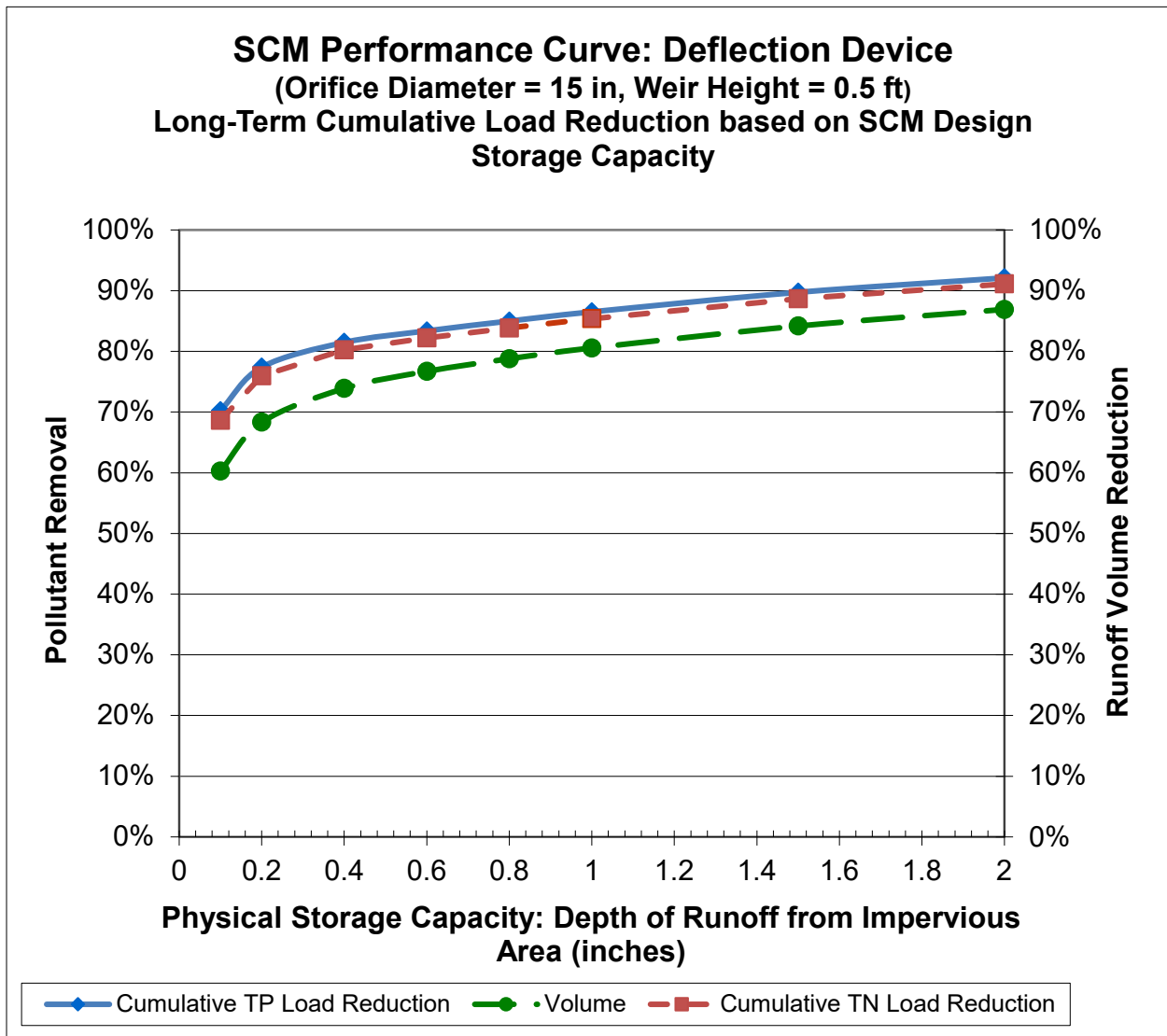
Figure 38: Deflection Device (Orifice Diameter = 15 in, Weir Height = 0.5 ft) SCM Performance Curve

Table 39: Deflection Device (Orifice Diameter = 15 in, Weir Height = 1 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 15 in, Weir Height = 1 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	84%	89%	92%	93%	94%	96%	97%
Cumulative Phosphorus Load Reduction	79%	91%	95%	96%	97%	97%	98%	99%
Cumulative Nitrogen Load Reduction	77%	90%	94%	95%	96%	97%	98%	98%

Figure 39: Deflection Device (Orifice Diameter = 15 in, Weir Height = 1 ft) SCM Performance Curve

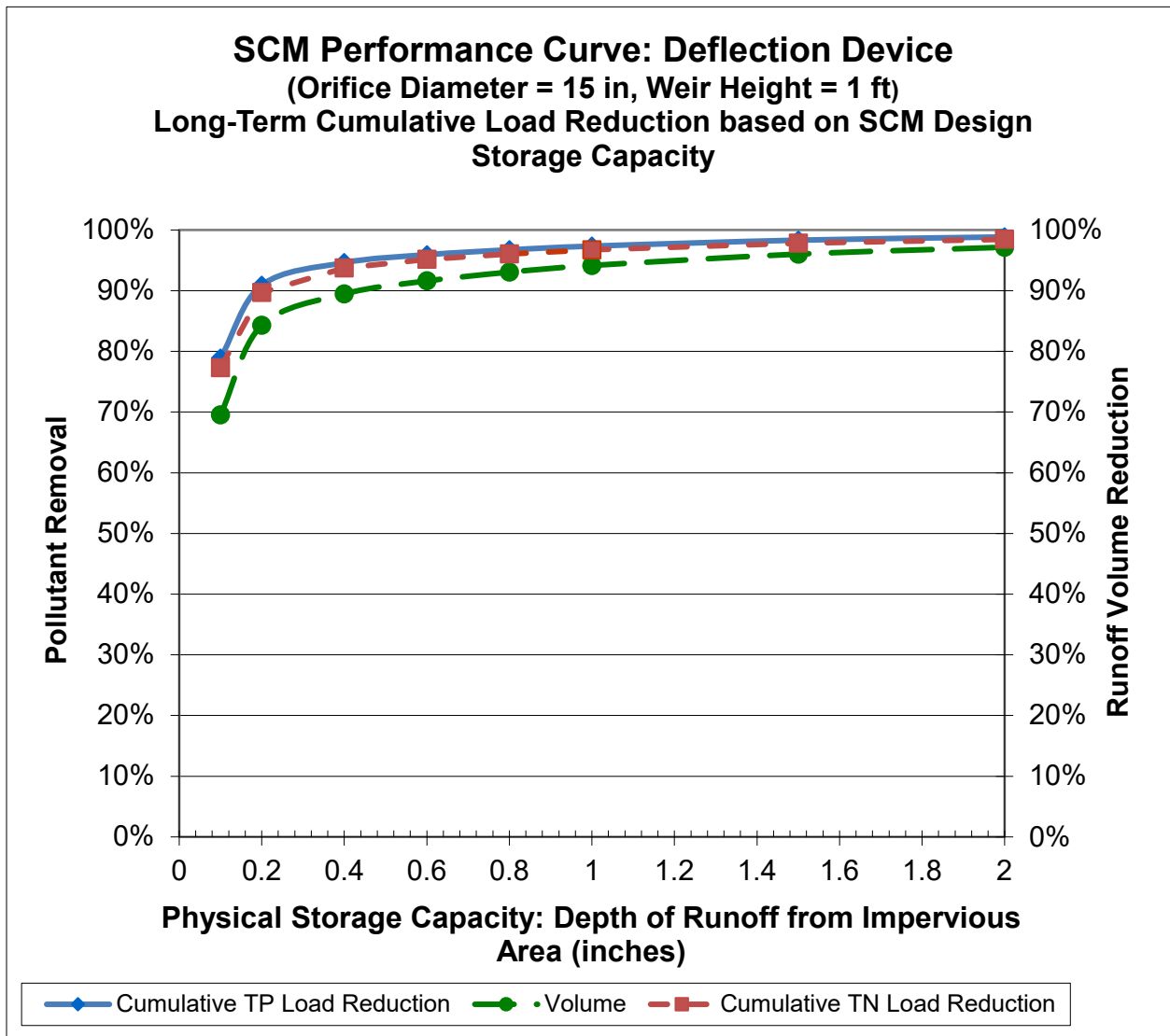


Table 40: Deflection Device (Orifice Diameter = 15 in, Weir Height = 1.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 15 in, Weir Height = 1.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	87%	93%	95%	96%	97%	98%	99%
Cumulative Phosphorus Load Reduction	79%	92%	97%	98%	98%	99%	99%	100%
Cumulative Nitrogen Load Reduction	77%	91%	96%	97%	98%	98%	99%	99%

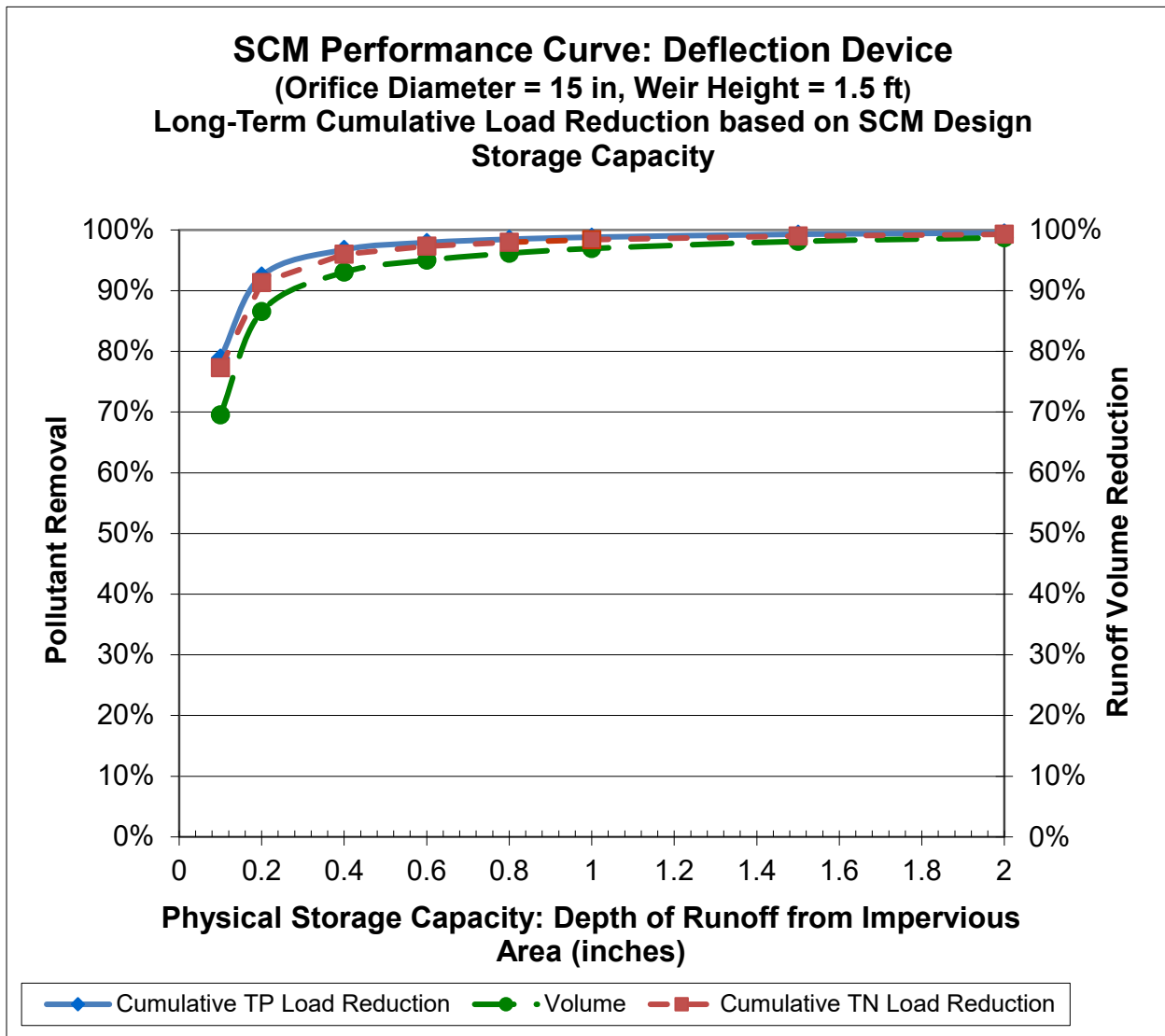
Figure 40: Deflection Device (Orifice Diameter = 15 in, Weir Height = 1.5 ft) SCM Performance Curve

Table 41: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 15 in, Weir Height = 2 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	87%	95%	96%	97%	98%	99%	99%
Cumulative Phosphorus Load Reduction	79%	92%	98%	99%	99%	99%	100%	100%
Cumulative Nitrogen Load Reduction	77%	91%	97%	98%	99%	99%	99%	100%

Figure 41: Deflection Device (Orifice Diameter = 12 in, Weir Height = 2 ft) SCM Performance Curve

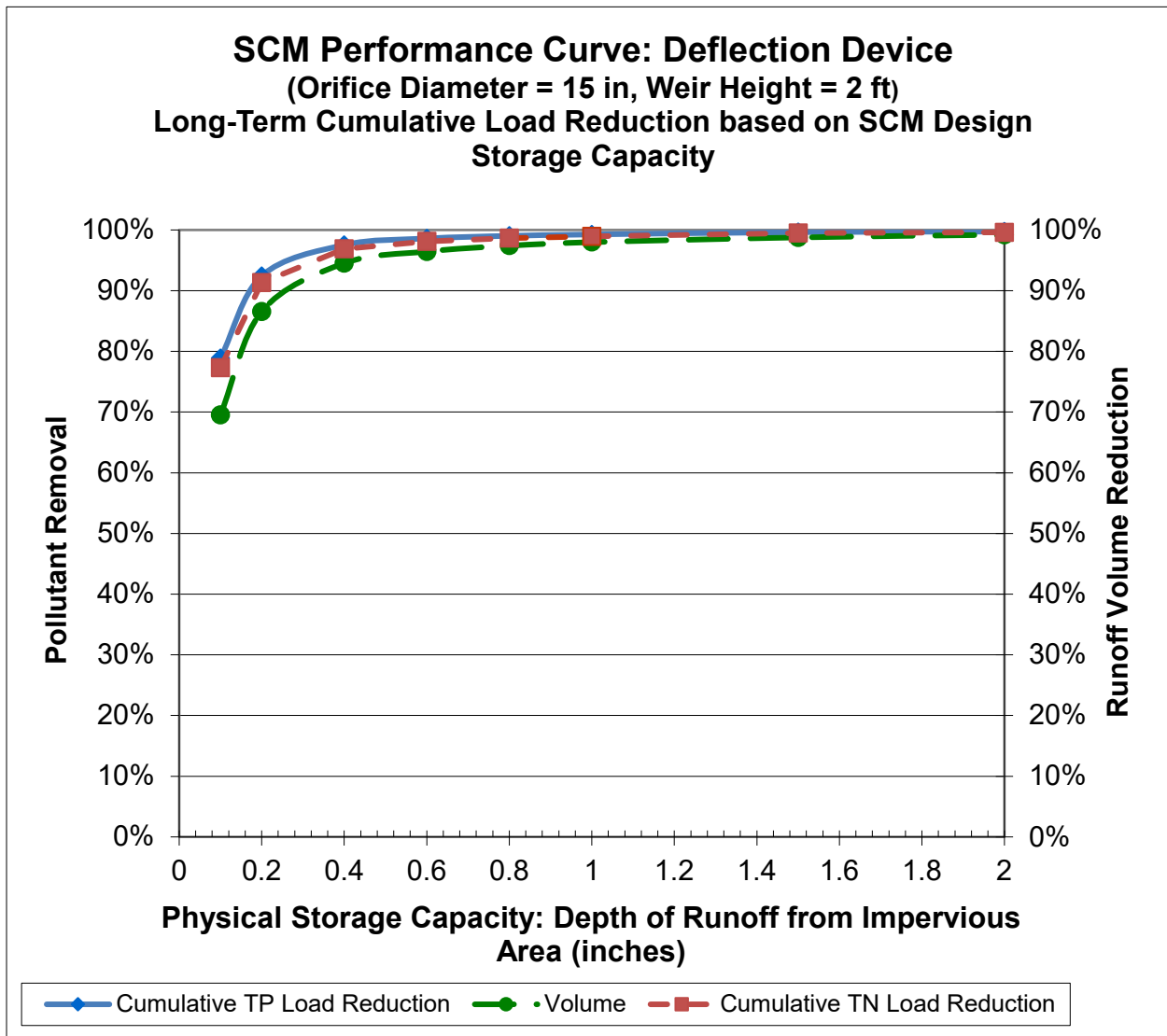


Table 42: Deflection Device (Orifice Diameter = 18 in, Weir Height = 0.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 18 in, Weir Height = 0.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	64%	72%	78%	81%	83%	84%	87%	89%
Cumulative Phosphorus Load Reduction	73%	81%	85%	87%	88%	90%	92%	94%
Cumulative Nitrogen Load Reduction	72%	80%	84%	86%	87%	89%	91%	93%

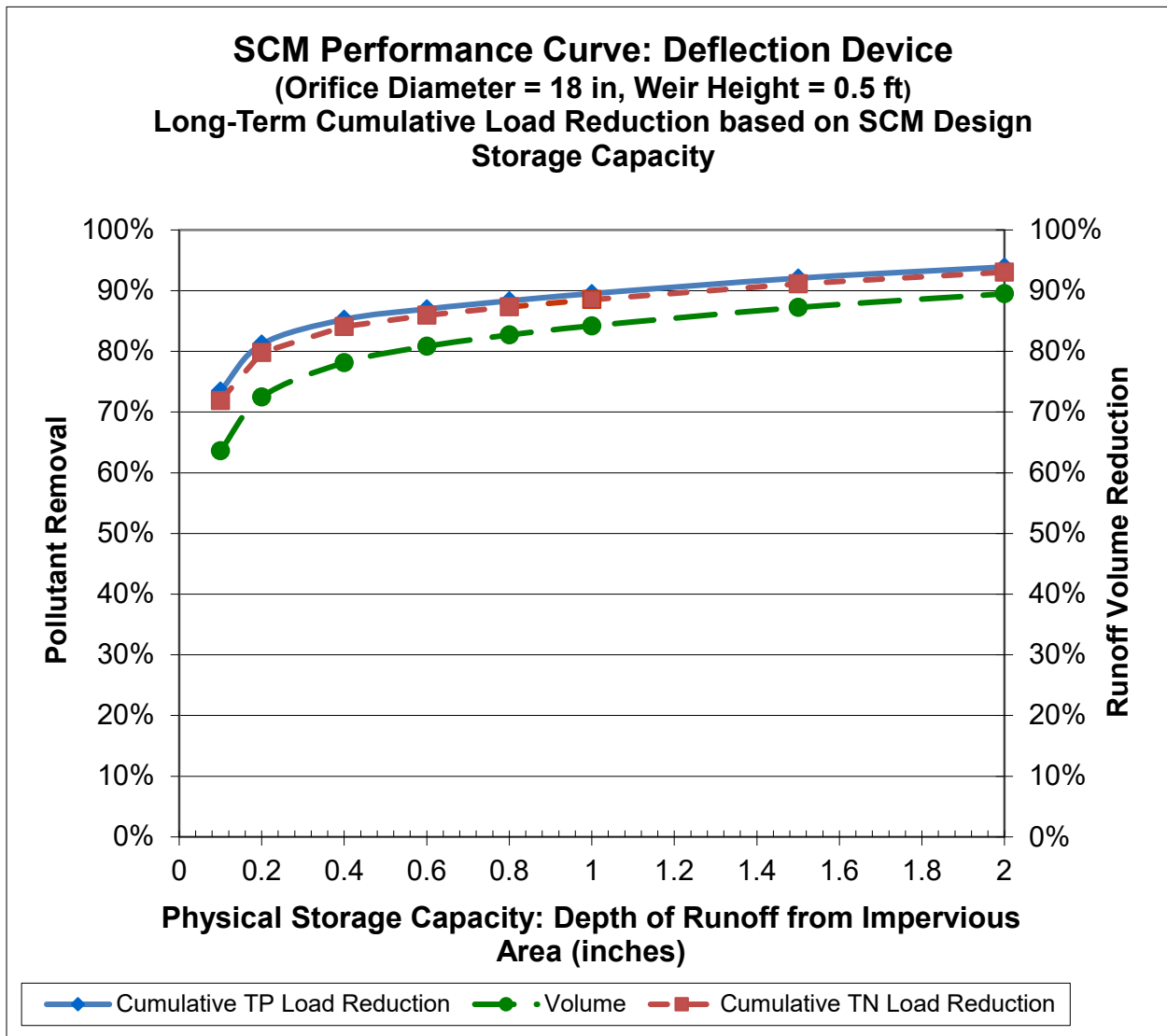
Figure 42: Deflection Device (Orifice Diameter = 18 in, Weir Height = 0.5 ft) SCM Performance Curve

Table 43: Deflection Device (Orifice Diameter = 18 in, Weir Height = 1 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 18 in, Weir Height = 1.0 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	86%	92%	94%	95%	96%	97%	98%
Cumulative Phosphorus Load Reduction	79%	92%	96%	97%	98%	98%	99%	99%
Cumulative Nitrogen Load Reduction	77%	91%	95%	97%	97%	98%	99%	99%

Figure 43: Deflection Device (Orifice Diameter = 18 in, Weir Height = 1 ft) SCM Performance Curve

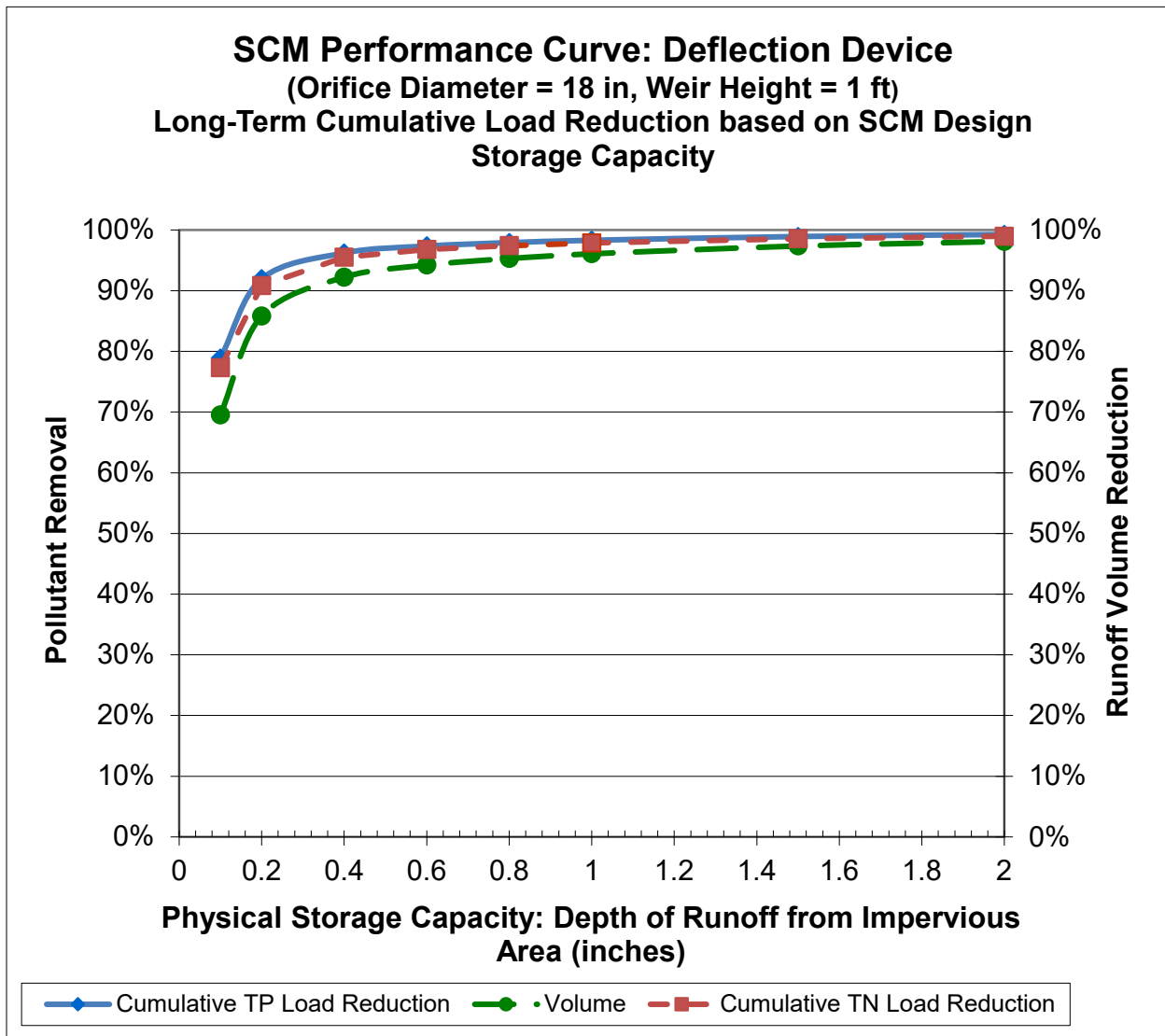


Table 44: Deflection Device (Orifice Diameter = 18 in, Weir Height = 1.5 ft) SCM Performance Table

Deflection Device (Orifice Diameter = 18 in, Weir Height = 1.5 ft) SCM Performance Table: Long-Term Load Reduction								
SCM Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1	1.5	2
Runoff Volume Reduction	70%	87%	95%	97%	98%	98%	99%	99%
Cumulative Phosphorus Load Reduction	79%	92%	98%	99%	99%	99%	100%	100%
Cumulative Nitrogen Load Reduction	77%	91%	97%	98%	99%	99%	99%	100%

Figure 44: Deflection Device (Orifice Diameter = 18 in, Weir Height = 1.5 ft) SCM Performance Curve