

# Constructed Wetland Factsheet

## 1.0 GENERAL DESCRIPTION



Figure 1. Constructed wetland (EPA)

Constructed wetlands are vegetated basins with shallow pools of water that allow stormwater to slowly infiltrate and receive treatment from the plant roots. The shallow pool may only exist through the wet season though some exist year-round, depending on location and climate. The wetland may or may not discharge back into a downstream water body. A schematic of a wetland is shown in Figure 2.

Potential Treatment Mechanisms								
I <sup>1</sup>	ET	FA	B	RH	S	F	P	T
✓	✓	✓	✓		✓		✓	
Legend: I = Infiltration			S = Sedimentation					
ET = Evapotranspiration			F = Floatation					
FA = Filtration and/or Adsorption			P = Plant Uptake					
B = Biochemical Transformation			T = Trash Capture					
RH = Rainfall and Runoff Harvest								

<sup>1</sup> For unlined systems only; these systems are sometimes constructed with a liner

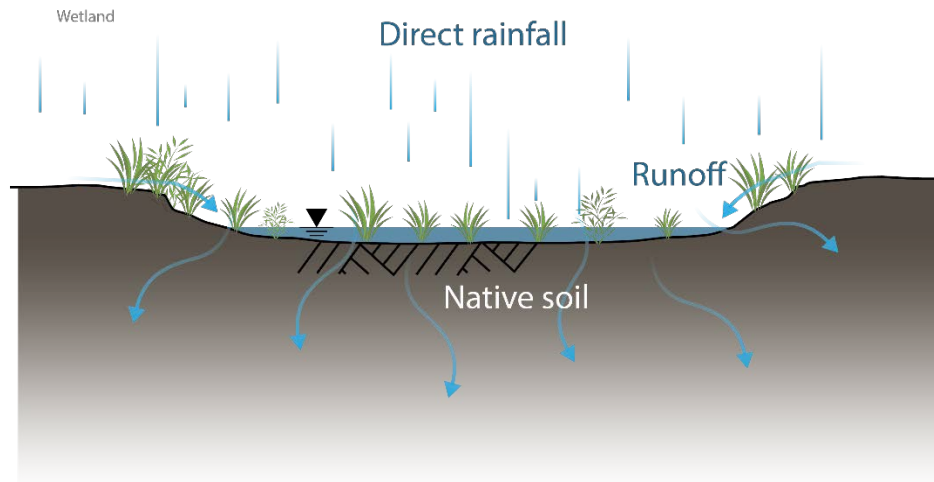


Figure 2. Schematic of a basic constructed wetland

## 2.0 ADVANTAGES & LIMITATIONS

### 2.1 Advantages

- ✓ Can provide habitat for wetland wildlife and add aesthetic appeal
- ✓ If designed and constructed well, constructed wetlands can provide significant reduction in contaminants/pollutants

### 2.2 Limitations

- ✗ Typically take years to establish
- ✗ Will require irrigation/supplemental water at first
- ✗ Public access safety concerns may require security fencing around the area
- ✗ Requires a significant amount of land

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### 3.0 SITING

Constructed wetlands are not suitable for areas with steep/unstable slopes. They are also not suited for cold water systems because the relatively deep still water in the pool will be much warmer than the cold water stream and so may warm the stream if it is discharged.

If the site has significantly porous soil, an impermeable liner along the bottom may be required.

### 4.0 DESIGN CONSIDERATIONS

When designing a constructed wetland, the following parameters should be considered:

- Contributing drainage area
- Design volume
- Drawdown time
- Permanent pool volume/depth
- Liner (optional)
- Inlet/outlet erosion control
- Forebay
- Open-water, wetland, and outlet zones
- Surge depth
- Length to width ratio
- Freeboard
- Bottom slope
- Embankment slope
- Side slopes
- Maintenance access ramp
- Vegetation
- Vector control animals (e.g., mosquito fish)

### 5.0 CONSTRUCTION CONSIDERATIONS

- Do not allow heavy machinery, vehicles, and other traffic to enter the basin
- Stabilize drainage area or divert any flows to prevent sediment loading and/or erosion during construction
- Ensure that the bottom is graded to be level and relatively flat
- Install seepage collars on outlet piping to prevent water from seeping out and causing damage

### 6.0 MAINTENANCE

- Maintain permanent pool of water (if designed to)
  - may require water to be pumped in
- Replace plants damaged during construction as well as any that do not establish
- Inspections for:
  - leaks in the outlet
  - trash and debris accumulation
- Inspections and treatment for mosquitos and other vectors

### 7.0 REFERENCES

California Stormwater Quality Association (CASQA 2003). *Stormwater Best Management Practice Handbook: New Development and Redevelopment*. January 2003.

California Stormwater Quality Association (CASQA 2017). *Draft Stormwater Best Management Practice Handbook: New Development and Redevelopment*. April 2017.

Sacramento Stormwater Quality Partnership (SSQP 2018). *Stormwater Quality Design Manual*. July 2018.