

# UP3 Project



## Conceptual Model for Transport of Insecticides Used in Urban Areas into Surface Waters

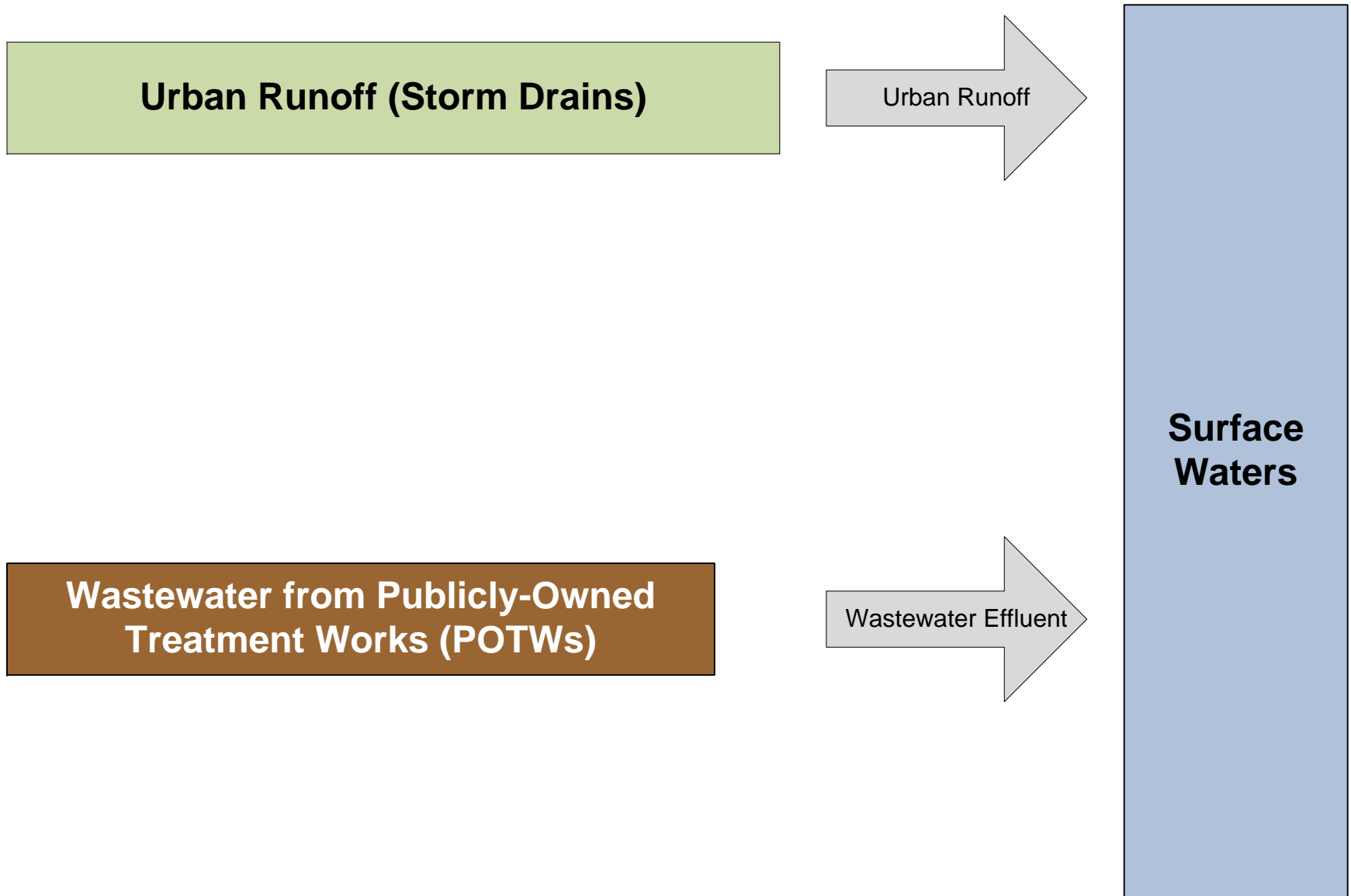
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Urban Pesticides Pollution Prevention Project

# Conceptual Model Overview



**Urban Runoff (Storm Drains)**

Urban Runoff

**Surface  
Waters**

**Wastewater from Publicly-Owned  
Treatment Works (POTWs)**

Wastewater Effluent

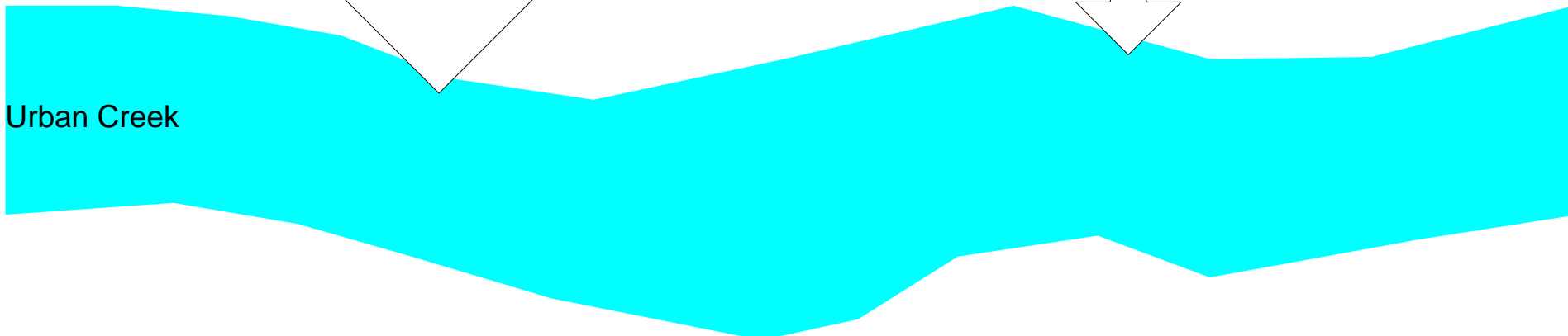
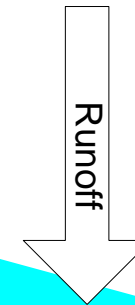
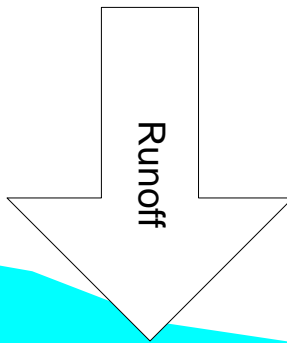
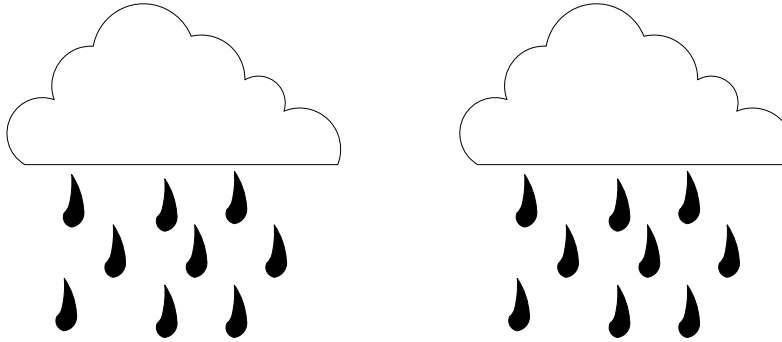
# Insecticides in Urban Runoff

## Sources:

- (a) Pesticide on impervious surfaces
- (b) Pesticide on lawns/grass
- (c) Pesticide on other pervious surfaces
- (d) Pesticide dumped in storm drain

## Outcomes:

- (1) Washed to storm drain/creek
- (2) Remains on land
- (3) Degrades prior to transport (degradates may need consideration)
- (4) Evaporates into air
- (5) Taken up by organisms



Urban Creek

# California Urban Watersheds Are Highly Impervious



Homes and Neighborhood Retail

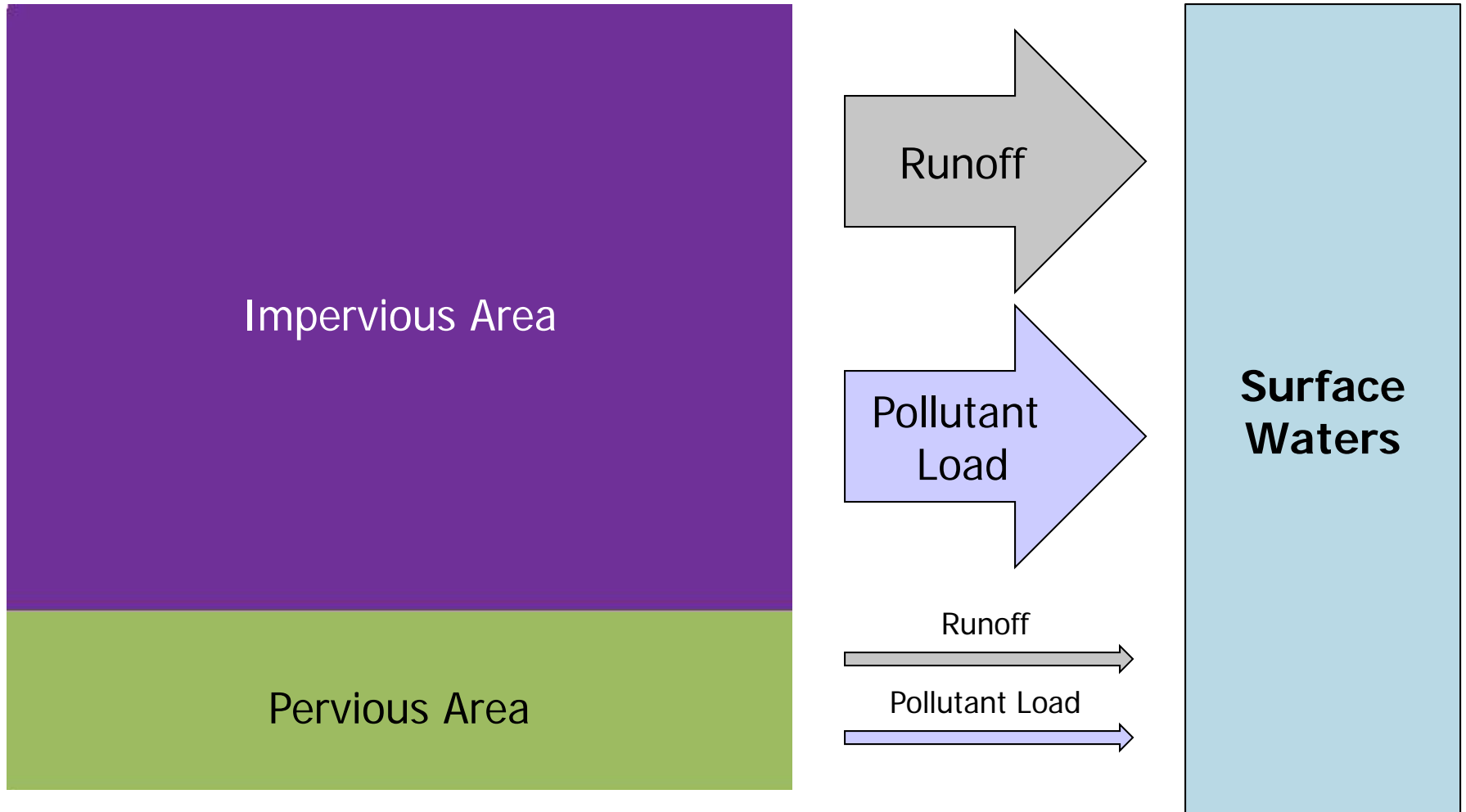
# California Urban Watersheds Are Highly Impervious



Shaded Area is Impervious

Land Use	Typical Imperviousness Sacramento CA (%)
Commercial	90
Apartments Condos	70-80
Single-family homes	40-60
Low-density residential	50
Park	10

# Most Urban Runoff – and Pollutant Load – From Impervious Surfaces



# California Drainage Design Enhances Pollutant Transport



Typical California urban stormwater conveyance system – Street gutter  
Water & pollutants efficiently moved to creeks

Time scale of transport – Minutes  
Pollutant losses in drainage system during major storm events – Low

# Pyrethroid Application to Impervious Surfaces Routine

- Typical 6-10 foot “band around the structure” label instruction for ant control
- Licensed applicators report as “structural pest control”



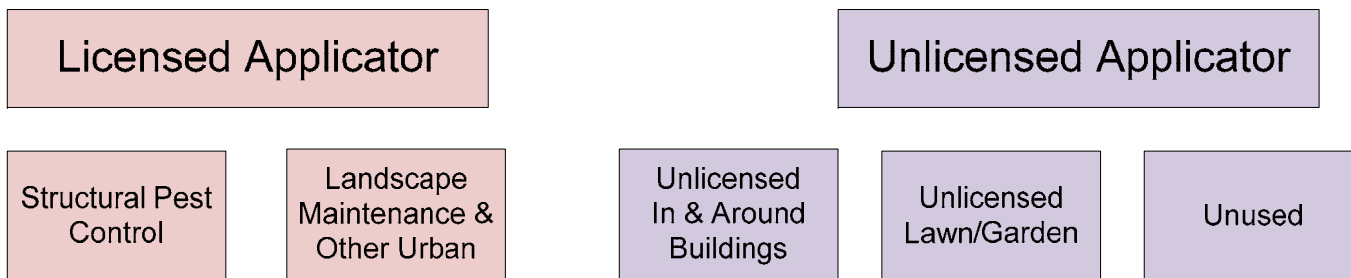


# California Non-Agricultural Pyrethroid Use

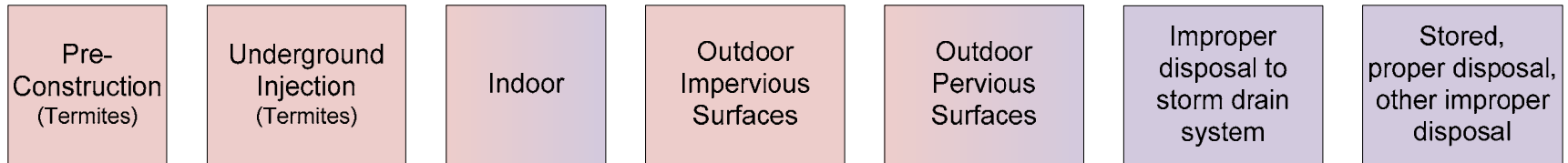
Licensed Applicator

Unlicensed Applicator

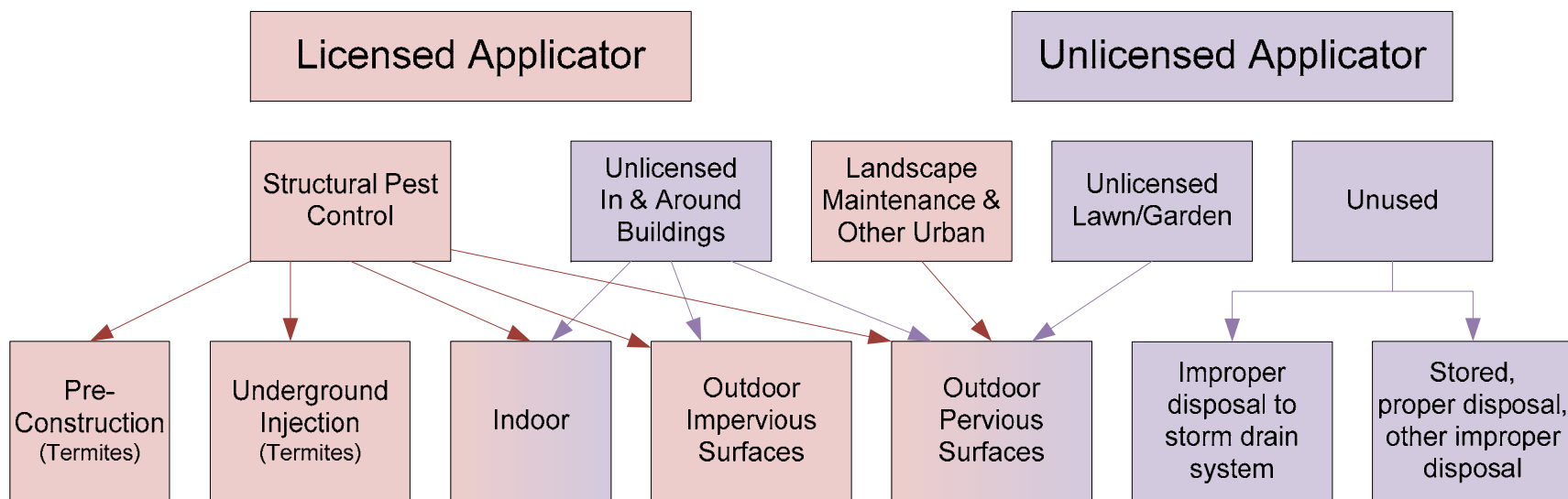
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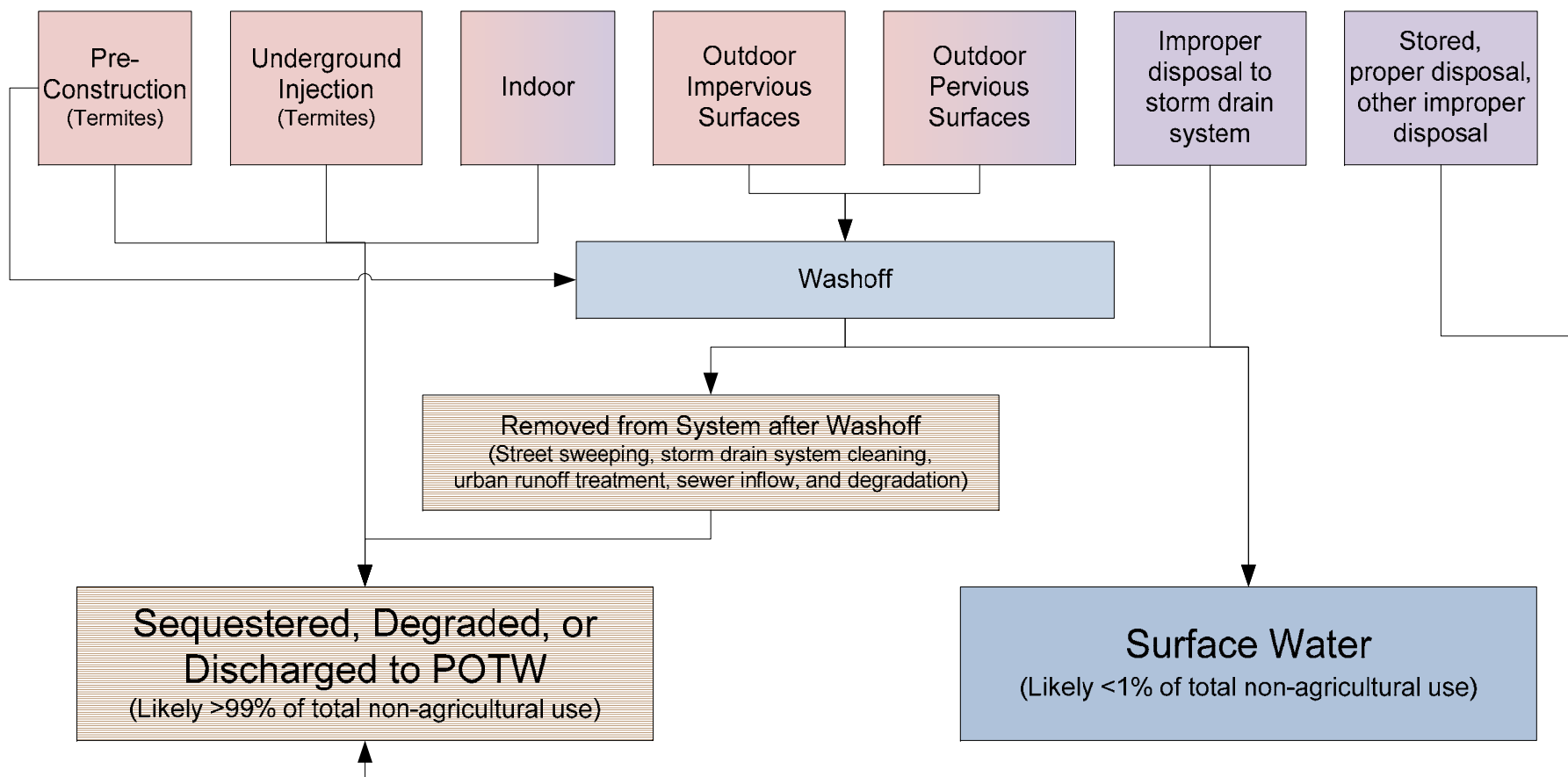
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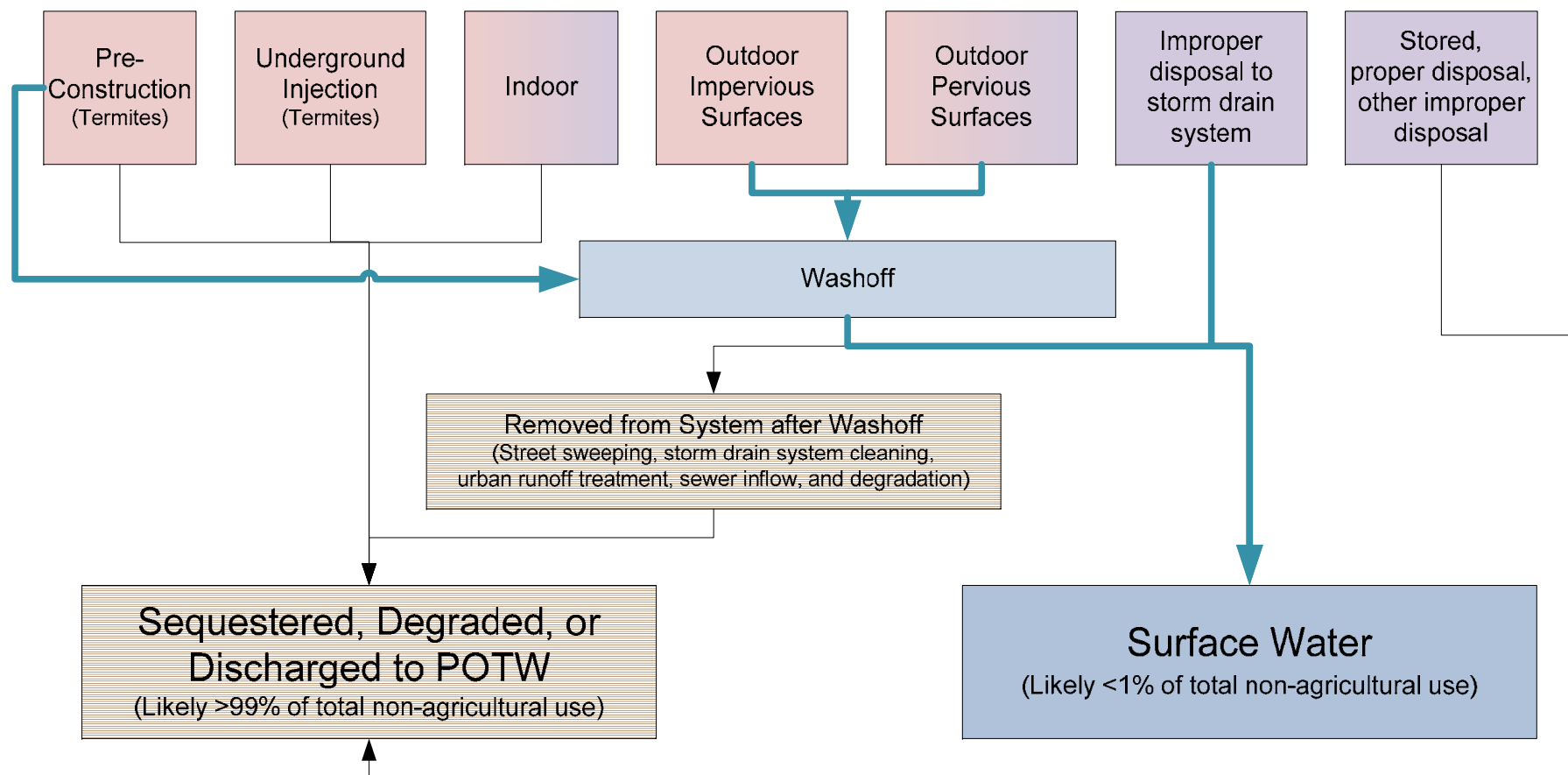
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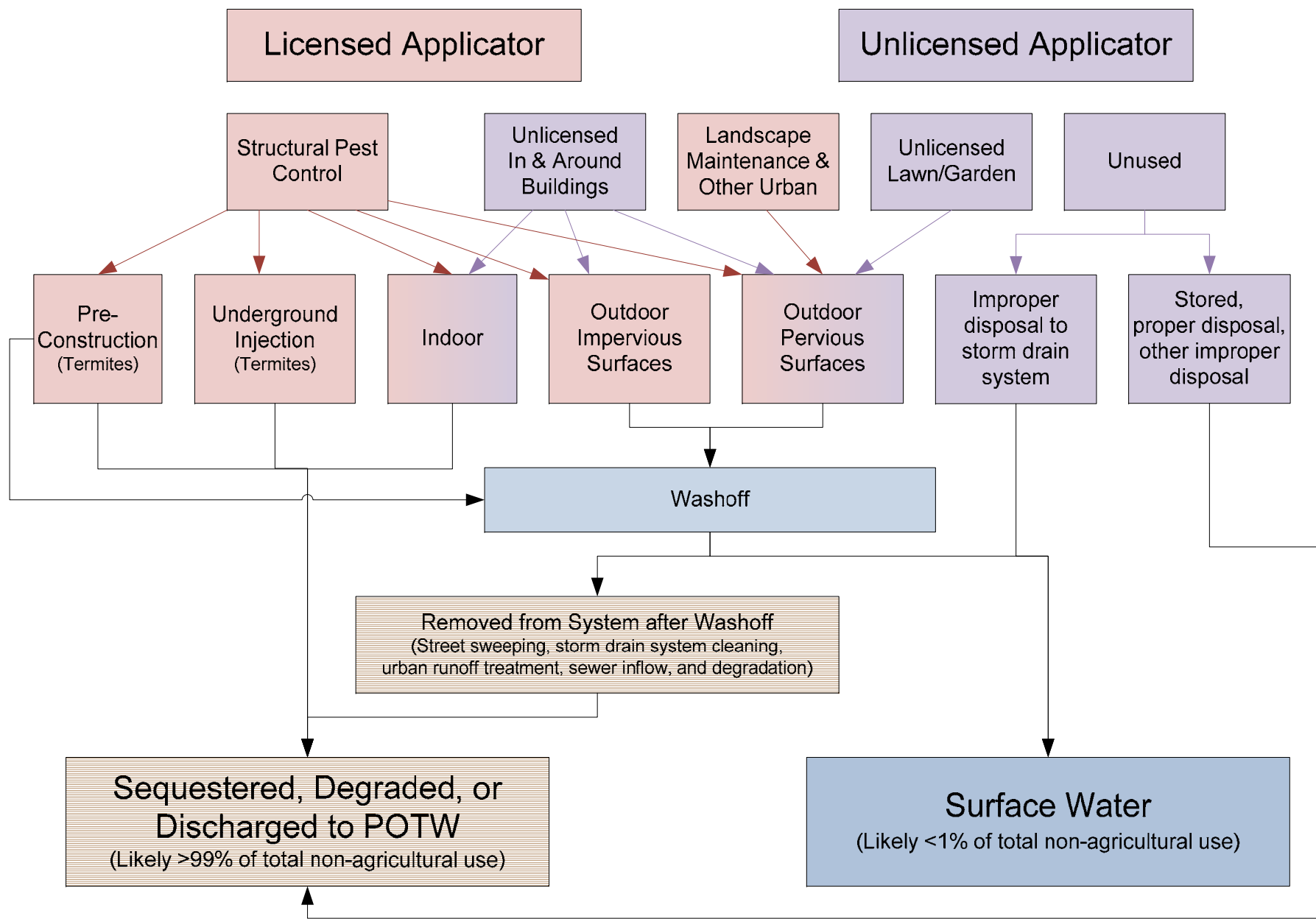
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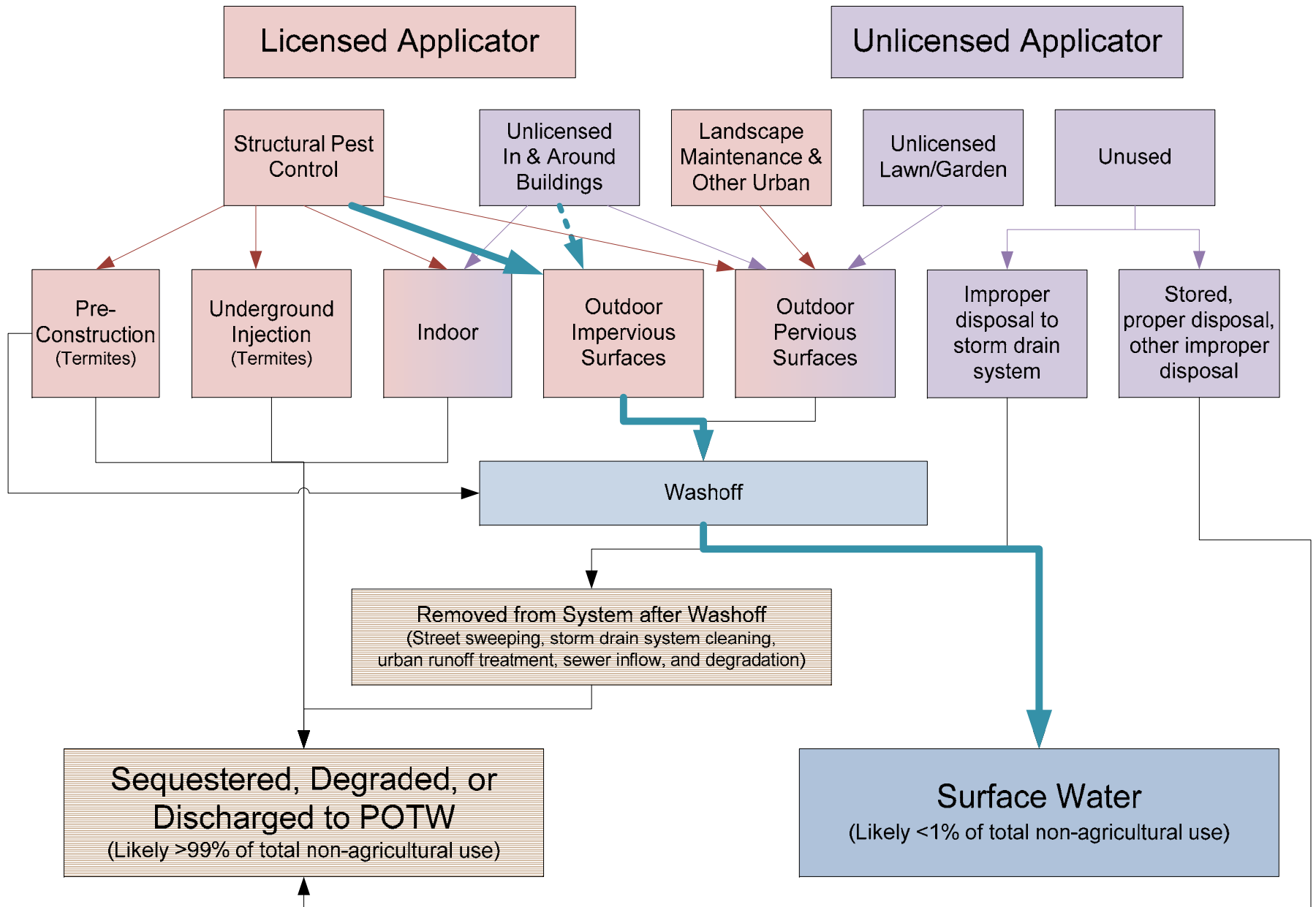
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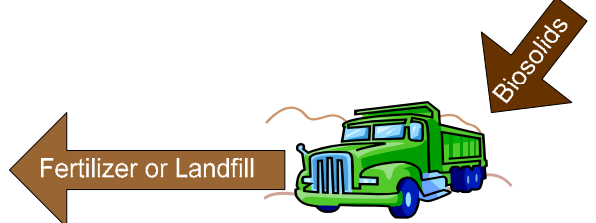
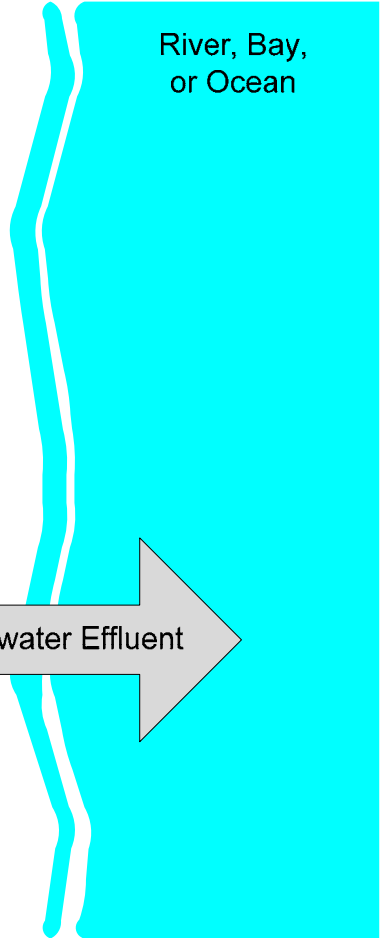
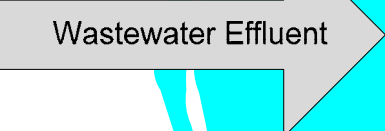
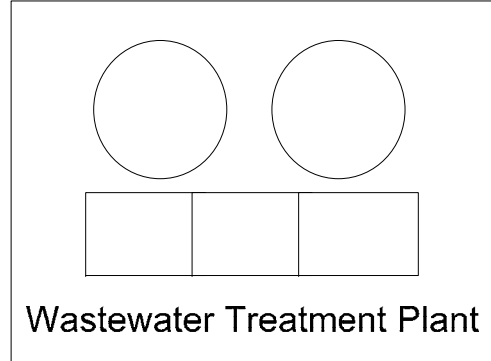
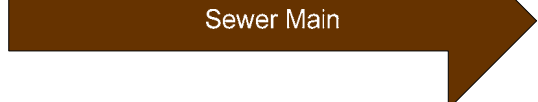


# California Non-Agricultural Pyrethroid Use





# Box 3: Wastewater



## Primary Sources:

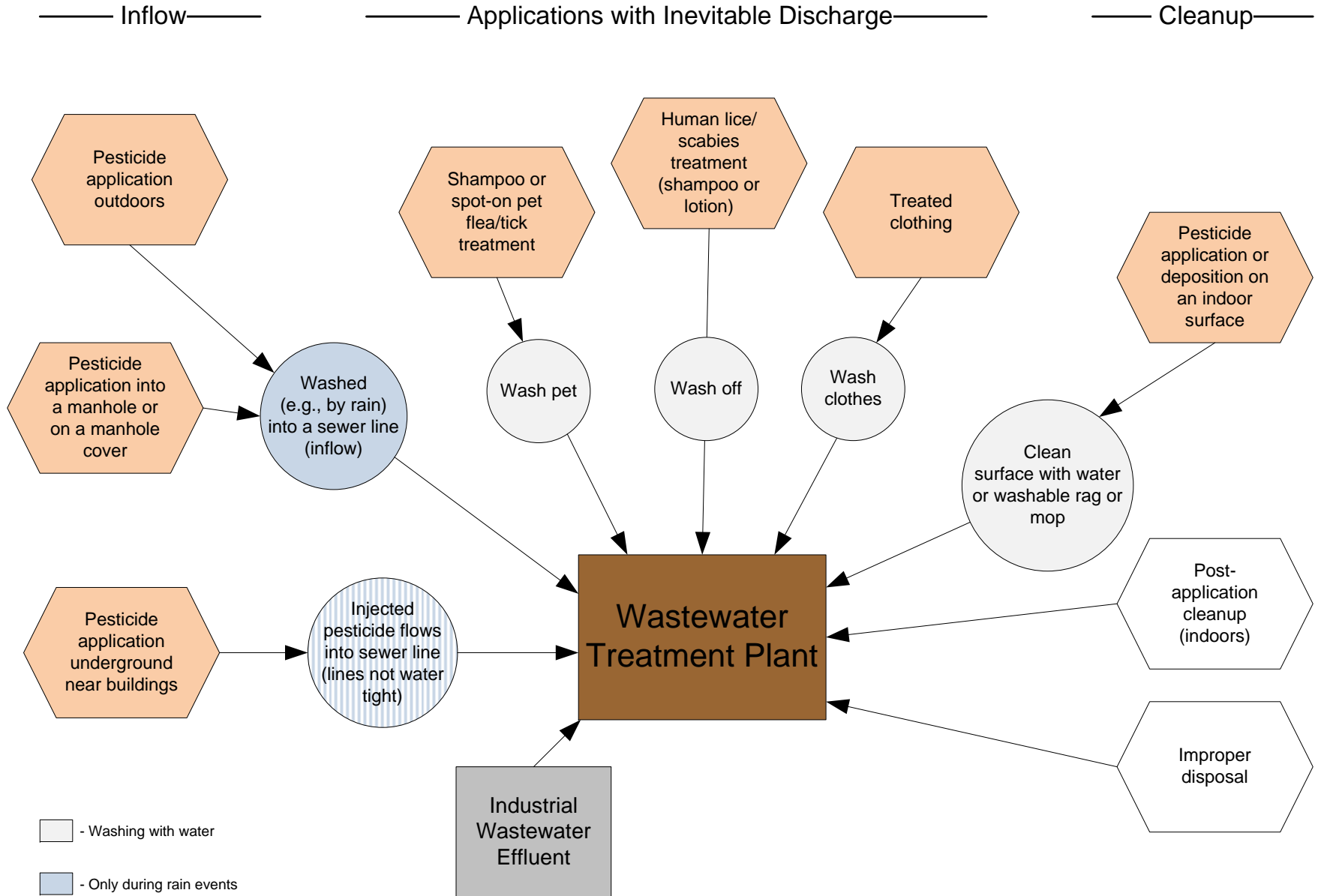
- (a) Use that inevitably creates a discharge
- (b) Cleanup
- (c) Inflow of urban runoff

## Outcomes:

- (1) In POTW effluent
- (2) In biosolids (sludge)
- (3) Degrades
- (4) Emitted to air

# Primary Pyrethroid Pathways to POTWs

Influent pyrethroid may biodegrade or transfer to biosolids, recycled water & effluent



# UP3 Project

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U.S. EPA



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