

# STORMWATER POLICIES

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# STORMWATER POLICIES

## 3.1 General Policies

The following general policies shall apply to new developments or redevelopments for which stormwater management controls are required:

- A waiver for compliance with any of the stormwater management standards must be requested of the local jurisdiction in writing at the time of, or prior to, the submittal of stormwater design information for the new development or redevelopment. The local jurisdiction will notify the person(s) requesting the waiver in writing at the time of, or prior to, approval or denial of the stormwater design information.
- Design computations shall be performed in accordance with the calculation guidance provided in this Manual, or other criteria that the local jurisdiction establishes based on scientific and engineering information to supplement or supersede this guidance.
- Stormwater runoff resulting from developed conditions on a site must be routed at appropriately small time intervals through water quality and quantity controls using either hand calculations or computer software/models that are approved by the City of Valley Center. Acceptable computer software/models are presented in Volume 2 of this Manual.
- All calculations utilized in the design of stormwater controls must be prepared by an engineer that is proficient in the field of hydrology and hydraulics and licensed to practice in the State of Kansas.
- The boundaries and elevations of the floodplain and floodway shall be depicted on stormwater design plans using site specific topography.
- The local jurisdiction may require the stormwater management facility(s) that serve the development or new development to be placed in a reserve and/or a drainage easement that is suitable for access by maintenance equipment. The need for reserves/drainage easements for stormwater facilities will be determined by the local jurisdiction during their review of the drainage plan for the site. In general, water quality volume reduction areas, open channels, creeks, flood hazard areas, dry detention ponds, extended detention ponds, and wet ponds shall be located in a reserve.

## 3.2 Water Quality Treatment

### 3.2.1 Summary of Local Regulatory Language

The requirements for water quality treatment for new development and redevelopment that are stated in the local stormwater management regulations differ slightly, as summarized in the box below. Note: the requirements stated in the regulations are only summarized here. Readers should refer to the actual stormwater management regulations for the specific and correct wording of these requirements.

#### Water Quality Treatment Requirement for New Developments

Stormwater runoff must be treated for water quality prior in accordance with the standards and criteria presented in this section of the Stormwater Manual.

#### Water Quality Treatment Requirement for Redevelopments

Property owners must adhere to one of the following options in order to comply with the water quality treatment requirement for redevelopments.

1. A 20% reduction in impervious area on the property;
2. Stormwater runoff from at least thirty percent (30%) of the site's existing impervious cover and for one-hundred percent (100%) of the impervious cover for any newly disturbed area must be treated for water quality prior in accordance with the standards and criteria presented in this section of the Stormwater Manual;
3. Equivalent water quality controls must be provided at an alternative location in the same watershed as the proposed redevelopment;
4. One or more known downstream water quality or channel erosion issues located within the same watershed as the proposed redevelopment must be addressed through stream restoration and/or other off-site remedies.
5. Any combination of (1) through (4).

The Water Quality Treatment Standard that is referred to in the requirement for new developments and in options 1, 2 and 3 for redevelopments is presented in this section. Note that policies that are specific to design calculations for different stormwater management facilities are included in Volume 2 of this Manual, where facility design specifications are presented.

### 3.2.2 Stormwater Treatment Standards and Criteria

The following policies comprise the stormwater quality treatment standards and criteria for the City of Valley Center.

- Water quality treatment facilities shall be designed to remove, at a minimum, 80% of the average annual total suspended solids (TSS) load for typical urban runoff (after-development) from the stormwater volume required for water quality treatment. This stormwater volume shall henceforth be called the "water quality treatment volume" (WQ<sub>v</sub>). This standard is also referred to in this Manual as the "80% TSS removal standard".

- The 80% TSS removal standard shall be applied to the 85<sup>th</sup> percentile storm event for the Valley Center area, which is equal to 1.2 inches of rainfall. The 85<sup>th</sup> percentile storm event is defined as the storm depth for which 85 percent of all storms are smaller.
- The WQ<sub>v</sub> and % TSS removal shall be calculated for the development or redevelopment in accordance with the policies and calculation guidance provided in Volumes 1 and 2 this Manual. In order to comply with the 80% TSS removal standard, the result of the % TSS removal calculations for the entire development or redevelopment must be no less than 80%.
- It is presumed that a stormwater management facility (or system of facilities) complies with the Water Quality Treatment Standard if the structural water quality controls are selected, designed, constructed and maintained in accordance with the design criteria specified in this manual and whose calculated TSS removal % for the entire development or redevelopment is equal to or greater than 80% TSS. Because this is a presumptive standard, analytical monitoring (i.e., sample collection and analysis of stormwater runoff) upstream or downstream of structural water quality controls is not required.
- Only those structural facilities that are included in this Manual are permitted for use as a water quality treatment facility. Other facilities are prohibited, unless their performance has been verified and they are approved by the local jurisdiction. This list of controls has sufficient flexibility and variation to fit most site development situations.
- The structural facilities (and variations thereof as described in Volume 2 Chapter 3) that are acceptable for use in the City of Valley Center to attain the Water Quality Treatment Standard are presented in Table 3-1.

**Table 3-1 % TSS Removal for WQ<sub>v</sub> Treatment Structural Facilities**

Structural Facility	% TSS Removal
Stormwater Pond	80
Dry Extended Detention Pond	60
Enhanced Swale	90
Grass Channel	50
Infiltration Trench	90
Soakage Trench	90
Vegetative Filter Strip	50
Surface Sand Filter	80
Underground Sand Filter	80
Organic Filter	80
Bioretention Area	85
Stormwater Wetland	75
Proprietary Manufactured Device	device-specific
Gravity Oil/Water Separator	device-specific
Alum Treatment	90
Green Roof	installation-specific

Table 3-1 also presents the % TSS removal value that is assigned to each structural facility type. Only this value shall be used to calculate the total weighted % TSS removal for the development site.

- Innovative technologies that are not included in this Manual are encouraged provided that such methods, designs or technologies will meet or exceed the stormwater treatment standards set forth by local regulation and this Manual. It is the responsibility of the property owner and/or the site design engineer to provide adequate proof of the effectiveness of such methods, designs, or technologies in meeting local requirements.

### 3.2.3 Obtaining a Waiver

The requirements for water quality treatment may be waived by the local jurisdiction if it is determined by the local jurisdiction that the pollutants of concern from the new development or redevelopment are not those identified in the Manual and would be best treated using an alternative approach than that defined by the Manual.

### 3.2.4 Water Quality Treatment Controls for Special Circumstances

The local jurisdiction may require additional water quality treatment criteria or controls to conform to State and/or Federal regulatory requirements, and/or to address watershed or site-specific water quality requirements, or on land uses that have the potential to discharge pollutants in higher amounts or that would not be adequately treated using the structural facilities identified in this manual. For example, additional treatment criteria may be required if the new development or redevelopment will have a land use or on-site activities that have the potential to generate highly polluted runoff, with concentrations of pollutants in excess of those typically found in stormwater. Examples of such land uses might include operations producing concrete or asphalt, auto repair shops, auto supply shops, large commercial parking areas, or restaurants. Examples of additional controls for such lands uses could include installation of specialized structural facilities such as oil/water separators for petroleum based pollutants, or the implementation of pollution prevention practices, such as employee training programs on chemical handling/application. The implementation of any additional controls are the responsibility of the property owner and/or business/activity operator.

General policies for structural facilities and pollution prevention activities at land uses that are often identified as having a higher than normal pollutant potential are presented in the following paragraphs.

**Gas stations, vehicle maintenance, washing or storage facilities.** Gas stations, vehicle storage and/or maintenance facilities shall address the potential for pollutant discharges from petroleum-based products, oils and other fluids in the following manner:

- Oil/water separators or other separation or absorbent devices that target removal of gasoline, petroleum based products, oils and other fluids commonly associated with motor vehicles (e.g., anti-freeze) shall be installed to reduce or eliminate the potential for such pollutants to be discharged into stormwater runoff.

- Gas pump areas and vehicle maintenance areas shall be covered and not exposed to rainfall and stormwater runoff. Floor drains in these areas shall not be connected to the stormwater system. Wash water from these areas should be prevented from discharging to the stormwater drainage system.
- Discharges of wash water resulting from the hosing or cleaning of vehicles, equipment and/or facilities is considered an illegal non-stormwater discharge. Therefore, wash water must be prevented from entering the stormwater system. These activities could include blocking the stormwater system or diverting the wash water into a pre-treatment measure and then into the sanitary sewer system. Floor drains in vehicle wash areas shall not be connected to the stormwater system. It is preferred that these areas be covered and therefore not exposed to rainfall and stormwater runoff.
- Pollution prevention activities for vehicle maintenance, washing, or storage land uses shall be employed as appropriate, focusing on:
  - spill prevention and cleanup;
  - oil and other fluid and material recycling;
  - staff education on proper pollution prevention techniques; and,
  - customer education about repair and maintenance activities that are or are not acceptable on the premises.
- For businesses where vehicles will be stored, pollution prevention activities must also include routine inspection of the vehicles for leaks or discharges. Drip pans must be used to capture leaks and discharges until the vehicle can be maintained or fluids should be drained completely from vehicles that will remain unused.

**Recycling and salvage yard facilities.** Where the land use is a business that recycles or salvages vehicles or other equipment, the pollution prevention practices for that site must include draining the equipment of all fluids before storage. If the storage area is uncovered, pre-treatment controls are required to treat additional pollutants that could result from the storage or deterioration of the equipment or vehicles before the runoff discharges to structural stormwater controls.

**Restaurants, grocery stores, and other food service facilities.** Grease, trash and organic pollutants are pollutants that are typically encountered around restaurants, grocery stores, and other food service facilities. Pre-treatment to remove such pollutants prior to discharging to structural stormwater facilities is required, in order to prevent clogging of downstream BMPs and the stormwater system. Grease traps are required for all sinks and floor drains. Dumpsters shall be covered at all times, and leakage from dumpsters shall not be allowed to discharge to the stormwater system. As well, wash water from equipment and/or facility cleaning activities must either be discharged to the sanitary sewer or be pre-treated prior to discharging to a stormwater facility. Litter and other wastes shall be picked-up on a regular basis to prevent them from entering the stormwater system. Parking lots shall be swept/cleaned on a regular basis to remove gross solids. Wastes gathered during litter collection and parking lot cleaning activities shall be disposed of properly.

**Facilities that temporarily or permanently house animals outside (non-agricultural).**

Animal housing facilities, such as veterinary clinics, boarding facilities, recreational (i.e., non-agricultural) livestock stables, and animal shelters have the potential to deliver higher than normal bacterial loadings to the stormwater system. High counts of bacteria in streams and rivers can cause water quality impairments, but can also cause illnesses in people. Pollution prevention practices for these types of facilities shall include pet waste management practices, such as collecting and properly disposing of pet waste at landfills or wastewater treatment facilities. Soiled animal bedding shall be removed and properly disposed. Wood shavings or chips shall not be allowed to migrate into the stormwater system.

### **3.3 Water Quality Control using Non-Structural Preferred Site Design Practices**

Non-structural stormwater control practices (also called “Preferred Site Design” practices) are increasingly recognized as a useful tool in site design because they result in the generation of less stormwater runoff from a development site than what would be generated in a more conventional site design. As compared to conventional site designs, a Preferred Site Design approach attempts to adapt a development design to the existing site conditions, and therefore preserve the topography, vegetative cover and hydrologic and environmental features of a site to the maximum extent practicable. This results in less clearing and grading, less use of impervious areas, and therefore less stormwater runoff and dependency on stormwater infrastructure. Relevant to the stormwater management requirements contained in local stormwater management regulations and in this Manual, the use of Preferred Site Design practices in a site design can have the effect of reducing the runoff volumes and peak flows, and therefore the size of the stormwater management facilities and conveyance appurtenances that are needed to control stormwater on the site. Preferred Site Design practices are discussed in detail in Chapter 2 of Volume 2.

Uses of Preferred Site Design practices are included in the Stormwater Manual as an option, not as a requirement. As an incentive, a set of WQ<sub>v</sub> “reductions” has been developed to quantitatively recognize the benefits of certain practices to further reduce the volume of stormwater that must be treated for pollutants, and therefore reduce the size of the structural stormwater facility needed for water quality treatment.

General policies pertaining to WQ<sub>v</sub> reductions are as follows:

- The amount of WQ<sub>v</sub> reduction obtained for a site will be determined in accordance with the reduction guidance presented in Volume 2 of this Manual.
- WQ<sub>v</sub> reductions can only be claimed if the area or practices for which the reduction is requested conforms to all of the required minimum design criteria and conditions stated in Volume 2 of this Manual. Full or partial reductions will not be given to areas or practices that do not conform to all of the criteria and conditions. The intent of this policy is to avoid situations that could lead to a reduction being granted without the corresponding decrease in pollution attributable to an effective Preferred Site Design practice.

- WQ<sub>v</sub> reductions cannot be claimed twice for an identical area of the site (e.g., a reduction for stream buffers cannot be claimed if that area has already received a reduction for disconnecting impervious areas).
- General Preferred Site Design practices and techniques performed without regard to the criteria and conditions stated in this Manual will not be awarded WQ<sub>v</sub> reductions. However, these practices reduce the overall impervious and disturbed area of a development. This land use change reduces the total amount of stormwater runoff generated by a site, and thus the required WQ<sub>v</sub>, because the calculation of WQ<sub>v</sub> is dependant upon site imperviousness. That is, the higher a site's impervious area, the higher the WQ<sub>v</sub>, and vice versa

### **3.4 Ground Water Protection**

It is the intent of the City of Valley Center to minimize the risk of contaminating groundwater by stormwater runoff discharged from new developments and redevelopments. The design guidance in Volume 2 of this manual requires minimum separation between the bottom of certain stormwater management facilities (wet ponds, infiltration trenches, soakage trenches, sand filters, organic filters, bioretention areas and wetlands) and the historical high groundwater table. These measures are intended to minimize the risk of contaminating groundwater with stormwater runoff. However, in all cases, more restrictive regulations invoked by local, State or Federal authorities, or adopted local, State or regional groundwater programs shall apply.

For areas where the historically high groundwater table is within 5 feet of the bottom of the stormwater facility, stormwater runoff from a new development or redevelopment may be discharged into one of the facilities identified in the paragraph above only after the runoff has met the Water Quality Treatment Standard, as defined in the local stormwater management regulations and in this Manual. This separation distance may be reduced to 2 feet if additional measures such as lining or underdrains are installed per the guidance found in Volume 2 of this manual. The local jurisdiction may waive this requirement if engineering studies determine that installing the required water quality treatment practices are unnecessary to protect groundwater quality, human health and the environment.

Any discharge of stormwater runoff directly to groundwater must meet all applicable local, State and Federal requirements, permits, plans and programs. The person(s) responsible for the new development or redevelopment are also responsible for all local, State and Federal permits that may be applicable to the site.

### **3.5 Downstream Stabilization Standard**

#### **3.5.1 Standards and Criteria**

The following policies comprise the downstream stabilization standard for the City of Valley Center. Implementation of this standard is intended to minimize the effects of

development on long-term downstream channel erosion and the delivery of sediment to local waterbodies.

The downstream stabilization shall be provided for developments that:

- will create or add five (5) acres or greater of impervious cover, including projects that have less than five acres of impervious cover but are part of a larger common plan of development or sale that will result in five acres or greater of impervious cover; and,
- are located in watersheds or on streams that are designated by the City and/or the County as a Downstream Stabilization Protection Volume Watershed or Stream.

When required, downstream stabilization shall be provided in one of the following ways:

1. the runoff volume from the new development that results from the 1-year frequency, 24-hour storm event shall be detained for not less than 24 hours; or
2. the volume difference between the pre-development and post-development runoff from the development that results from the 1-year frequency, 24-hour storm event must be infiltrated, reused or evaporated.

Calculation methods that must be used to meet the downstream stabilization standard are presented in Volume 2 of the Manual. There are no additional policies associated with downstream channel erosion protection in this volume.

### **3.5.2 Obtaining a Waiver**

The requirement for downstream stabilization may be waived by the local jurisdiction if engineering studies show that the stormwater conveyance channels located downstream of the new development or redevelopment are capable for resisting long-term erosion. Engineering studies must be reviewed and approved by the local jurisdiction in order to obtain the waiver.

## **3.6 Stormwater Quantity Management (Peak Discharge Analysis and Control)**

Local stormwater management regulations require that stormwater runoff peak discharge analysis and control be implemented in accordance with the stormwater quantity standards and criteria provided in the Stormwater Manual. Policies associated with the peak discharge control standard are listed below.

### 3.6.1 Peak Discharge Control Design Standard

Applicable new developments and redevelopments (as defined by the local regulation) shall adhere to the following peak discharge control standard:

- The calculated peak discharge of stormwater runoff at each site stormwater outfall resulting from the 2-year, 5-year, 10-year, 25-year and 100-year return frequency, 24-hour duration storm events shall be no greater after development or redevelopment of the site than that which would result from the same 2-year, 5-year, 10-year, 25-year and 100-year return frequency, 24-hour duration storm events on the same site prior to development or redevelopment.
- For redevelopment sites, peak discharge controls shall be sized using the existing developed land use as the baseline condition, not the land use that existed prior to the original development of the site.
- Peak discharge analyses should be performed after any Preferred Site Design practices have been included in the design. The use of Preferred Site Design practices will inherently reduce runoff volumes and potentially reduce post-development peak discharges, both on-site and downstream of the site.

### 3.6.2 Downstream Hydrologic Analysis (The 10% Rule)

Downstream hydrologic analysis shall be performed for all applicable new developments and redevelopments (as defined by the local regulation) in accordance with the following policies:

- Sites with Off-Line Stormwater Management Facilities. A downstream hydrologic analysis to determine if the new development or redevelopment causes an increase in peak discharges and velocities compared to pre-development peak discharges and velocities for the same site shall be performed for the 2-year, 5-year, 10-year, 25-year and 100-year return frequency, 24-hour duration storm events. Peak discharges and velocities shall be evaluated at the location(s) of the stormwater outfall(s) from the new development or redevelopment and at each downstream tributary junction, bridge, culvert, weir or dam to the next junction, bridge, culvert, weir or dam (whichever is encountered first) beyond the ten-percent (10%) point(s). If increases in the peak discharge or velocity are identified at any point in the analysis area as defined in this paragraph, the stormwater management facilities at the new development or redevelopment shall be re-designed to eliminate such peak discharge and velocity increases.
- Sites with On-Line Stormwater Management Facilities. A downstream hydrologic analysis to determine if the new development or redevelopment causes an increase in peak discharges and velocities as compared to pre-development peak discharges and velocities for the same site shall be performed for the 2-year, 5-year, 10-year, 25-year and 100-year return frequency, 24-hour duration storm events. Peak discharges and velocities shall be evaluated at the location(s) of the stormwater outfall(s) from the new development or redevelopment and at each downstream tributary junction, bridge, culvert, weir or dam to the ten-percent (10%) point(s), or to the point(s) where the peak discharge and velocity

are no longer increased, whichever is further downstream. If increases in the peak discharge or velocity are identified at any point in the analysis area as defined in this paragraph, the stormwater management facilities at the new development or redevelopment shall be re-designed to eliminate such peak discharge and velocity increases. Peak discharge control evaluations showing full routing calculations and supporting documentation shall be submitted with the drainage plan, in the manner described in Volume 2 of this Manual.

### **3.6.3 Obtaining a Waiver**

The requirement for peak discharge control may be waived if it is demonstrated by an engineering study that:

1. the new development or redevelopment does not cause an increase in peak discharges from pre-developed conditions for the required storm events; or,
2. increased peak discharges are adequately handled by the existing downstream channel without adverse impacts as defined in the Manual.

Engineering studies must be reviewed and approved by the local jurisdiction in order to obtain the waiver.

### **3.6.4 Stormwater Conveyance Design**

It is the intent of the local jurisdiction to ensure that stormwater control infrastructure is capable of safely and efficiently conveying the applicable design flows; that the infrastructure is durable and maintainable; and that structures are protected against flood damage even when the infrastructure experiences runoff events greater than the design flows, up to the 100-year flood occurrence. The specific requirements are detailed in local floodplain regulations, and the design procedures for achieving those requirements are provided in Volume 2 of the Manual. There are no additional policies associated with downstream channel erosion protection in this volume.

## **3.7 Floodplain Management**

The local jurisdiction's primary floodplain management requirements are contained in their floodplain management and/or flood damage prevention regulations. However, these regulations address only those requirements for areas that are designated by the Federal Emergency Management Agency (FEMA) as special flood hazard areas and are included on the Valley Center or Sedgwick County Flood Insurance Rate Maps (FIRMs). Additional floodplain management requirements are contained in local stormwater management regulations, which address both special flood hazard areas and floodplains and flood-prone areas that are not included on FIRMs.

Specific policies to support local jurisdiction floodplain management requirements are as follows:

- Watershed analysis and planning efforts have indicated that the flood potential in specific drainage basins within each jurisdiction is especially sensitive to changes in floodplain storage volumes. In short, a loss of floodplain storage volume in such basins may significantly raise the flood potential for habitable structures in the basin. In an effort to eliminate the loss of floodplain storage in volume sensitive basins, the local jurisdictions have included a requirement in their stormwater management regulations and/or floodplain management regulations to provide compensatory storage when development or other encroachments occur in the floodplains of volume sensitive basins. Policies associated with this requirement are as follows.

Volume sensitive basins shall be defined by the local jurisdiction. The location and magnitude of compensatory excavations shall be provided with the stormwater design information that is incorporated into the construction plan, and must be approved by the local jurisdiction prior to excavation activities.

- The property owner performing compensatory excavations is responsible for obtaining all applicable local, State and Federal permits.

