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<b>Title:</b>	Single-Family Residential Drainage, Erosion, and Sediment Control Requirements
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***Abstract***

This ordinance establishes minimum sediment and erosion control requirements in Douglas County to protect the “life, property and the environment.” It was awarded the International Erosion Control Association (IECA)'s Environmental Achievement Grand Award in 2004. It applies to all single-family and includes slope requirements for final pervious and non-pervious grades on the lot, and the installation of Best Management Practices before the Certificate of Occupancy can be issued.

***Resource***

SECTION 31A SINGLE-FAMILY RESIDENTIAL DRAINAGE, EROSION AND SEDIMENT CONTROL REQUIREMENTS

**3101A Intent**

To establish minimum drainage, erosion and sediment control requirements to:  
 Protect, to the greatest extent practicable, life, property and the environment from loss, injury and damage by stormwater runoff, erosion, sediment transport, ponding, flooding, landslides, accelerated soil creep, settlement and subsidence, excessive dust, and other potential hazards, caused by grading, construction activities and denuded soils; and  
 Protect surface waters, public right-of-way (ROW), private property, drainage systems, wetlands and watercourses from sediment loads; and  
 Protect the public interest in drainage control including lot drainage, drainage basins, drainage infrastructure and watercourses; and  
 Provide an aesthetically pleasant environment for County residents, visitors and passers through.

**3102A Drainage, Erosion and Sediment Control Requirements**

3102A.01 Scope

These regulations apply to drainage, erosion and sediment control for:

All single-family residential development projects not covered by Section 31 of this Resolution; and

New single-family residential construction and new construction (e.g., additions and construction of arenas, accessories, etc.) on existing single-family home sites; and

Idle single-family residential lots both permitted and non-permitted (e.g., lots owned by the builder or the land developer and not yet under construction); and

Grading, excavating, and stockpiling of earth and landscape materials (not specifically limited to new construction) which results in the transport of any of these materials off site by any means including, but not limited to, wind or water erosion and vehicular tracking.

A Building Permit shall not be issued until a Drainage, Erosion and Sediment Control (DESC) Permit is issued. Under an active DESC Permit, the Permittee is responsible for and is subject to any liability for drainage, erosion, and sediment control for the permitted site. The DESC Permit shall not be issued until a DESC Plan is submitted and approved by the DESC Administrator. The DESC Plan may be a plot plan modified to meet the requirements of this Section. The DESC Plan will be reviewed for compliance with this Section and, when applicable, the approved drainage patterns set forth in the "area grading plan" approved by Douglas County Engineering in accordance with Section 31 of the Douglas County Zoning Resolution, as amended.

After construction, the DESC Permit shall be deactivated. To deactivate the permit, a fully executed DESC Certification Letter must be submitted along with a Drainage Certificate. For all construction eligible to receive a Certificate or Occupancy (CO), the DESC Permit shall be deactivated prior to release of the CO. For construction not eligible to receive a CO (e.g., barns, arenas, garages, etc.) the DESC Permit must be deactivated prior to a Final Inspection. In cases where final grade cannot be established due to weather conditions and a DESC Certification Letter cannot be fully executed, a CO may be issued or, when a CO is not applicable, a final inspection may be completed in accordance with Section 3102A.03.10 herein.

### **3102A.02 Minimum Drainage Requirements for Finished Grade**

3102A.02.1 A minimum slope of 10.0% and a maximum of 33.0% in the first 10.0 feet away from the foundation walls and window wells shall be established for pervious surfaces except when limited by property lines or when natural vegetation is to be preserved and documentation of adequate drainage is provided. All other pervious areas shall have a minimum of 2.0% slope (a 2.5% slope is recommended for grassy areas) away from the foundation. All pervious and impervious areas shall slope continuously to the lowest point where stormwater discharges from the lot (e.g., sidewalk, gutter, inlet, adjacent property, or easement). At this point, the discharge water shall be dispersed into a sheet flow and directed

in a manner as to not cause harm to downslope properties. Where minimum slopes cannot be attained, another means to adequately convey the water from the lot shall be professionally designed and submitted for County approval.

3102A.02.2 Impervious surfaces adjacent to the foundation shall have adequate drainage away from the foundation as determined by a Professional Engineer (see the Uniform Building Code for specific requirements).

3102A.02.3 Drainage swales may not be located within the foundation backfill zone unless limited by property lines. Drainage swales shall have adequate depth, width and longitudinal gradient to convey the stormwater off the lot in an effective, non-damaging manner. Drainage swales shall be designed to spread flows out as much as feasible. When using privacy fences, they shall be installed in a manner that will not affect approved drainage patterns and flow paths.

3102A.02.4 Manmade slopes steeper than 33.0% require a properly designed retaining wall(s) when other effective means of stabilization cannot be achieved. Retaining walls shall not encroach onto adjacent properties. Retaining walls taller than 4.0 feet (including footing) require a Building Permit and shall be designed by a Professional Engineer (PE). Refer to current building codes for additional requirements.

3102A.02.5 Driveways shall have a minimum slope of 2.0% away from the foundation for a distance that will allow adequate drainage away from the garage entrance as determined by a Professional Engineer.

3102A.02.6 Downspouts and sump-pumps shall discharge a minimum of 5.0 feet away from the foundation wall and outside the foundation backfill zone unless limited by property lines. For tract housing projects, downspouts shall be oriented to discharge in the general direction of the drainage swale flow (not perpendicular to or against the flow). Downspouts shall not directly discharge onto adjacent properties. Downspouts and sump-pumps shall not discharge directly onto ROWs unless the discharge is associated with the implementation of a temporary BMP (e.g., a flexible pipe connected to the downspout to convey water to the sidewalk during construction) and appropriate safety precautions (i.e., OSHA requirements) are implemented. Consult with the Douglas County Engineering Division regarding ROW concerns (e.g., sidewalk and street cuts, traffic control, chase-drain requirements, etc.).

3102A.02.7 Where catch basins or inlets are installed, finish grade elevations of adjoining areas shall provide for emergency surface overflow so that, in the event of failure of catch basins or inlets, buildings and window wells will be protected against flooding.

3102A.02.8 Any developer, builder or property owner should seek assistance from a Licensed Professional Engineer who is experienced in drainage, and a professional who is experienced with implementing effective erosion and sediment control practices, before changing any historic drainage paths or flow volumes.

### **3102A.03 Minimum Erosion and Sediment Control Requirements**

3102A.03.1 Lot specific structural and/or nonstructural BMPs shall be selected, submitted, approved and implemented to reduce erosion and sediment transport on construction sites. Refer to the "DESC Standard Forms, Drawings, and Approved BMPs" packet.

3102A.03.2 After installing and implementing BMPs, a DESC Inspection Report shall be fully executed and submitted to the DESC Administrator for approval. Building inspections may not occur until the report is approved.

3102A.03.3 If drainage, erosion or sediment problems become apparent during construction, such as when off-site sedimentation occurs, the BMPs shall be re-evaluated and re-implemented in an effective manner.

3102A.03.4 For BMPs to function effectively, it is recommended they be inspected and maintained at least every 14 days and after any precipitation, snowmelt, or runoff event that causes surface erosion, sediment transport, or vehicular tracking.

3102A.03.5 Streets shall be cleaned when earth materials are tracked, spilled or washed onto streets, or as directed by the Douglas County Planning Director.

3102A.03.6 When cleaning streets, they shall not be washed until they have been scraped and swept and inlet protection has been properly installed (to avoid washing sediment and construction debris down inlets or off site). Street sweeping shall be conducted in a manner that prevents the formation of dust.

3102A.03.7 Earth materials and landscape materials, such as sod, rock and mulch, shall not be stockpiled, placed or stored on streets, sidewalks or stormwater flowlines (refer to Section 43-5-301, CRS).

3102A.03.8 Construction supplies (e.g., trusses and lumber), roll-off containers, dumpsters, portable toilets, trailers, etc. shall not be stored on streets or sidewalks. These items shall be stored on the construction site(s) or staging area(s) (refer to Section 43-5-301, CRS).

3102A.03.9 Under an active DESC Permit, the Permittee shall be responsible for all drainage, erosion, and sediment control related to the permitted site. To deactivate the DESC Permit, either permanent erosion control or adequate temporary erosion and sediment control shall be installed. At the time of DESC Permit de-activation, the temporary erosion and sediment control shall be verified by the Permittee to be properly installed and designed to remain effective for a period of 90 days or until the homeowner installs permanent erosion control, whichever comes first. After the DESC Permit is de-activated, erosion and sediment control is the sole responsibility of the homeowner (or builder, if the home remains unsold). Also, to ensure proper site drainage, adequate drainage away from the foundation and off the lot shall be certified by a PE or Professional Land Surveyor (PLS) before the DESC Permit can be de-activated.

3102A.03.10 In cases where final grade cannot be established due to weather constraints, a Certificate of Occupancy (CO) may be issued or, when a CO is not applicable, a final inspection

may be completed. The DESC Permit shall remain active until the DESC Certification Letter is received. The Permittee (not the homeowner unless the homeowner is the permittee) shall be responsible for drainage, erosion, and sediment control until the DESC Certification Letter is fully executed and the DESC Permit is de-activated. The DESC Permit may remain active for a period of up to, but not more than, 180 days after the CO issuance date.

3102A.03.11 The Director of Planning and Community Development may grant an extension, of not more than 30 days, upon a written request by the Permittee, prior to the expiration of the DESC Permit. Failure by the Permittee to request an extension prior to the expiration date of the DESC Permit shall constitute a violation of the provisions of Section 31A and each day after the expiration date shall be punishable as a separate offense.

#### **3102A.04 Erosion and Sediment Control Requirements for Tract Housing**

In addition to the minimum erosion and sediment control requirements set forth in Section 3102A.03, the following erosion and sediment control requirements shall be required for both the builder and the developer related to tract housing developments:

3102A.04.1 Throughout build-out, the developer is responsible for implementing and maintaining BMPs to control erosion and sediment problems on all idle lots not yet purchased by the builder.

3102A.04.2 When a group of lots (a cell) is purchased from the developer, the builder shall be responsible for maintaining all BMPs implemented by the developer and taking any necessary corrective actions to control erosion and sediment problems throughout build-out.

3102A.04.3 The first builder to commence construction shall maintain inlet BMPs at all sump inlets designed and constructed to receive runoff from the permitted lot. Inlet BMPs shall not restrict the designed cross-sectional flow (i.e. the BMP must have adequate overflow). Inlet BMPs shall not be placed at any on-grade inlets in a manner that causes water to bypass the inlet. Refer to the "DESC Standard Forms, Drawings, and Approved BMPs" packet.

3102A.04.4 In cases of multiple builders, where the first builder has completed construction within the cell, the subsequent builder(s) shall maintain inlet BMPs. The subsequent builder(s) shall be determined by the Douglas County Director of Planning and Community Development using criteria including, but not limited to, building permit issuance date, site investigation and the proximity of construction to the inlet(s).

#### **3102A.05 DESC Plan Submittals**

A DESC Plan shall be prepared and submitted for County approval. Two copies for each parcel shall be submitted with the Building Permit Application. The following items shall be clearly illustrated on the DESC Plan:

3102A.05.1 Illustrate all property lines, easements, and set-backs.

3102A.05.2 Illustrate planned improvements and permanent structures such as sidewalks, patios, swimming pools, driveways, porches, retaining walls, lined swales, etc..

3102A.05.3 Provide a north arrow, the street address, subdivision, filing, and lot and block (section, township, and range if unplatted).

3102A.05.4 The plan size for lot sizes of 1 acre or less shall be 8 ½" by 14" (legal). The plan size for lots greater than 1 acre shall be 24" by 36" or 11" by 17".

3102A.05.5 A scale of 1-inch equals 20 feet shall be used unless the lot won't fit on legal paper; then a scale of 1-inch equals 30 feet may be used. Illustrate the scale used on all pages submitted.

3102A.05.6 Spot elevations shall be illustrated on the DESC Plan in sufficient quantities to accurately illustrate the site drainage patterns. For larger sites (1 acre or larger), these may be grouped around the foundation area (within 100 feet of the foundation).

3102A.05.7 Illustrate high points and drainage arrows with percent slope at 25-foot intervals along drainage swales.

3102A.05.8 Illustrate all slopes to the nearest 1/10<sup>th</sup> percent in critical areas. Illustrate all elevations to the nearest 1/10<sup>th</sup> foot.

3102A.05.9 Illustrate top of foundation at each elevation change and driveway elevations at the garage entrance and at the point of discharge.

3102A.05.10 Illustrate where stormwater runoff enters the lot and discharges to adjacent ROWs, properties and easements.

3102A.05.11 Illustrate all structural BMPs to be used and their locations. Include a schedule of non-structural BMPs to be used. Refer to the "DESC Standard Forms, Drawings, and Approved BMPs" packet.

### **3103A Authority**

The Director of Planning and Community Development shall have authority to implement and enforce these regulations.

The Director of Planning and Community Development is authorized to take actions necessary to implement the provisions and purposes of these regulations, including, but not limited to: promulgating and amending rules and regulations which may include prescribing BMPs; establishing and conducting inspection programs; requiring responsible parties to conduct monitoring programs; taking enforcement action; abating nuisances; promulgating guidance and policy documents; and reviewing and approving or disapproving required submittals and applications for approvals and permits.

### **3104A Notification of Violation**

Failure to meet the requirements of Section 31A shall result in the issuance of a Notice of Violation. Violations must be remediated within five (5) calendar days. If the violation is not remediated within five (5) calendar days, a Stop Work Order for all construction activities may be issued and prosecution may be commenced for violation of Section 31A. The Stop Work Order shall remain in effect until all items have been remediated and approved by the DESC Administrator.

### **3105A Violations**

Any person, corporation, partnership, firm or other entity of whatever description violating any provision of these regulations shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than \$100 or by imprisonment in the County jail for not more than 10 days, or by both such fine and imprisonment. Each day during which a violation exists shall constitute, and be punishable as, a separate offense.

This Section may be enforced by injunction, including both the enjoining of actions or inactions in violation of this Section (i.e., storing earth or construction materials on streets or sidewalks or failure to mitigate erosion and sedimentation problems, or in violation of the terms of a permit as required herein), and a mandatory injunction to require the removal of stored earth or construction materials or to mitigate erosion and sedimentation problems in violation of the terms of such a permit. In any such injunctive action, Douglas County shall be entitled to an award of its costs of suit and any costs incurred in removal of stored materials or mitigating erosion and sedimentation problems where construction activities have been undertaken in violation of the provisions of this Section.

Douglas County shall be entitled to recover its attorney's fees incurred in bringing any action to compel compliance with the provisions of these regulations or to compel compliance with any plan approved hereunder.

### **3106A Abatement**

In the event a Permittee shall determine or discover that a DESC Plan is not being adhered to, said Permittee shall take immediate steps to abate said violation and shall notify the County DESC Administrator of the deviation from the plan and the efforts undertaken to bring the work into compliance with said plan. The Permittee shall be granted a period of five (5) calendar days from the date of discovery of said deviation to bring the work into compliance with the plan.

In the event the County DESC Administrator discovers a deviation from the plan, the Permittee or authorized representative shall be notified in writing of said deviation and shall be required to bring the work into compliance with the plan within no more than five (5) calendar days from the date of notification. The written notice shall specify the areas of deviation from the plan. Failure to correct the deviation from the plan within the time period provided shall entitle Douglas County to invoke the provisions of Section 3105A.

### **3107A Compliance With Other Laws, Regulations, Ordinances and Standards**

The requirements of these regulations are minimum requirements. They do not replace, repeal, abrogate, supersede or affect any other more stringent requirements, rules, regulations, covenants, standards or restrictions. Where these regulations impose requirements that are more protective of human health or the environment than those set forth elsewhere, the provisions of these regulations shall prevail. In addition to these regulations, the provisions of the Douglas County Roadway Design and Construction Standards Manual (as defined in the Permit For Right-Of-Way Use and/or Construction – General Provisions) shall specifically apply and be enforced separately by the County Engineer for all stockpiling, obstruction and sedimentation occurring or deposited within the public ROW as applicable. Section 31 shall also apply specific to the Overlot Grading Permit issued for the area in which the DESC Permit exists.

Approvals and permits granted under these regulations are not waivers of the requirements of any other laws, nor do they indicate compliance with any other laws. Compliance is still required with all applicable federal, state and local laws and regulations.

### **3108A County Not Liable**

Nothing contained in these regulations are intended to be nor shall be construed to create or form the basis for any liability on the part of the County, it's officers, employees or agents for any injury or damage resulting from the failure of responsible parties to comply with the provisions of these regulations, or by reason or in consequence of any inspection, notice, order, certificate, permission or approval authorized or issued or done in connection with the implementation or enforcement of these regulations, or by reason of any action or inaction on the part of the County related in any manner to the enforcement of these regulations by its officers, employees or agents.

The Director of Planning and Community Development or any employee charged with the enforcement of these regulations, acting in good faith and without malice on behalf of the County, shall not be personally liable for any damage that may accrue to persons or property as a result of any act required by the County, or by reason of any act or omission in the discharge of these duties. The County shall defend any suit brought against the Director of Planning and Community Development or other employee because of an act or omission performed in the enforcement of these regulations.

### **3109A Definitions**

Abutting: Having a common border with, or separated from such a common border by a right-of way, alley or easement.

Accessory Structure: A subordinate structure detached from but located on the same lot as the principal structure, the use of which is incidental and accessory to that of the principal structure, excepting therefrom buildings defined herein as farm and commercial garden buildings.



Accessory Use: A use naturally and normally incidental to, subordinate to and devoted exclusively to the principal use.

Adequate Temporary Erosion and Sediment Control: Temporary erosion and sediment control designed, installed, implemented, and verified by the Permittee to remain effective for 90 days or until the homeowner installs permanent erosion control.

Adjacent: Having a common border with, or separated from such a common border by a right-of-way, alley or easement.

After Construction: After a home has been completed but before a Certificate of Occupancy (CO) has been issued, or, for structures not eligible to receive a CO, before a Final Inspection has been performed.

Agriculture: Farming, ranching, animal husbandry, and horticulture – Land used for grazing domestic animals or land used to produce products that originate from the land's productivity.

Approved: Approved by the Douglas County Director of Planning and Community Development or designees.

Backfill Zone: The area to be backfilled between the foundation and the excavation wall.

Berm: Mound of earth used in landscaping for screening, definition of space, noise attenuation or decoration.

Best Management Practice (BMP): A physical, structural, or managerial practice or device that prevents or reduces erosion or sedimentation.

NON-STRUCTURAL are those which require modified or additional operational or behavioral practices, such as street sweeping and washing or phasing construction activities on a project.

STRUCTURAL are those which require the construction of a structure or other physical modification on the site such as silt fencing, downspout extensions, or use of protective cover.

Board or Board of County Commissioners: The Board of County Commissioners of Douglas County; the governing body of Douglas County.

Borrow Site: A site used for extraction of earthen materials such as sand, gravel, rock, dirt, etc., where the material is removed from the legally described site and characterized by a short-term operation and a limited quantity of earthen material.

Building: Any permanent structure, or portion thereof, built for the shelter or enclosure of human beings, animals, or property of any kind and excluding signs or fences.

Building Permit: A document issued by the Douglas County Building Division giving permission for construction of a structure or other specified activity in accordance with the Uniform Building Code, Zoning Resolutions, and all applicable amendments and regulations.

Cell: A group of lots in a tract-housing development owned or under construction by one specific builder.

County: Douglas County, Colorado

Development: Any change to improved or unimproved real estate, including but not limited to: buildings, structures, mining, dredging, filling, grading, paving, excavation or drilling operations or any alteration to land, buildings or structures which falls under the purview of this Resolution.

Discharge Point: The location to which drainage water from a specific site is released.

Drainage Basin: The tributary area through which drainage water is collected, regulated, transported, and discharged to receiving waters.

Drainage Control: The management of drainage water. Drainage control is accomplished through the collection, conveyance, and discharge of drainage water.

Drainage, Erosion, and Sediment Control Plan (DESC Plan): A plan for collecting, controlling, transporting, and discharging drainage water falling upon, entering, flowing within, and exiting the site. The plan includes a schedule of Best Management Practices to be implemented to control erosion and sedimentation during construction. The Plan shall be a Plot Plan modified to meet the minimum requirements set forth in Section 31A.

Drainage Swale: A depression or defined channel that collects and conveys drainage water to a discharge point.

Drainage Water: Stormwater runoff, snow melt, surface water and irrigation runoff, water discharged from sump pumps, and runoff associated with street washing and other construction activities.

Driveway: A private vehicular access abutting a street, for the exclusive use of the owners and occupants of the lot, lots or project and their invitees, not considered to be a street.

Earth Material: Any rock, natural soil, or sediment, or any combination thereof.

Easement: An acquired right of use, interest or privilege in land owned by another.

Elevation: The vertical position of a surface in relation to a fixed reference point.

Erosion: The wearing away of the ground surface as a result of the movement of wind, water, or ice.

Excavation: The displacement of earth material, including minor adjustments to the surface of the site in preparation for construction.

Existing Grade: The natural or over-lot graded surface contour of a site before foundation excavation.

Fee Owner: Any person having title to and/or responsibility for a building site or property, including lessee, guardian, receiver or trustee, and the landowner's duly authorized agent.

Fill: Earth material deposited, placed, pushed, dragged, or transported to a place other than from the place from where it was excavated.

Final Grade: The grade after completion of construction, excavation, and fill.

Floodplain: The area adjoining any river, stream, watercourse, lake or other body of standing water which is subject to inundation by a 100-year flood. Refer to the floodplain overlay district section for more information.

Grading: Excavation, fill, in-place ground modification or any combination thereof, including the establishment of a grade following demolition of a structure.

Impervious Surface: Any surface that water runs across as opposed to soaking in, including, but not limited to, paved streets, paved driveways, treated surfaces, walkways, roof surfaces, and patios.

Inspector: The Permittee's inspector or representative, inspection agency, or licensed professional engineer performing the inspection work required by these regulations.

Landscape: Improvement to an area of land by the planting of a combination of trees, shrubs and ground covers.

Landscape Materials: Any rock, sod, bark, mulch, tree, shrubbery, topsoil, fertilizer, earth material, or any other material associated with establishing permanent vegetation, erosion control, or finished grade changes.

Legal Description: A written metes and bounds description of the boundary of a parcel of real property by a Professional Land Surveyor (PLS), for the purpose of perpetuating location and title. The description must recite all ties and monuments, recorded or physical, which will determine the correct position of the boundary, all references to adjoining lands by name and record, and a full dimensional recital of the boundary courses in succession which shall be mathematically correct. The description must be accompanied by an exhibit or map showing all pertinent information as described in the narrative.

Lot: A parcel of land designated as a lot on a recorded plat or a parcel of land that has been recorded by a deed in the Office of the Douglas County Clerk and Recorder provided such lot

was created in compliance with the State land-use laws and Douglas County subdivision and zoning regulations in effect at the time the lot/parcel was created. Also, Lot of record. (A tax parcel is not necessarily a lot of record.)

Permanent Erosion Control: A permanent method to stabilize the soil to prevent soil particles from being dislodged by wind and water erosion (e.g., establishing permanent vegetation such as sod).

Person: Any individual, firm, partnership, corporation, municipal corporation, and government, and the individual's or entity's heirs, successors, and assigns.

Plan: A graphic or schematic representation, with accompanying notes, schedules, specifications, and other related documents.

Plot Plan: A scaled map of a building site and adjacent public rights-of-ways showing locations and dimensions of various existing and proposed features such as buildings, curbs, driveways, sidewalks, trees, grades, easements, lot lines, elevations, and drainage patterns.

Professional Engineer (PE): A person who is licensed by the State of Colorado to practice civil engineering.

Professional Land Surveyor (PLS): A person who is licensed by the State of Colorado to practice land surveying.

Right-of-way: Land acquired by reservation, dedication, prescription or condemnation and intended to be occupied by a road, trail, water line, sanitary sewer or other public use.

Runoff: The flowing of water across the ground surface. Runoff includes, but is not limited to, stormwater, snowmelt, yard watering, and sump pump activity.

Sedimentation: The transport and deposition of earthen material dislodged by wind and water erosion.

Site: Any lot, parcel of land, street, or public right-of-way, or contiguous combination thereof, where a permit for new development, redevelopment, land disturbing activity, or grading has been issued or where any such work is scheduled to be performed.

Slope: An inclined ground surface. Slope may be expressed as a percentage or a ratio.

Soil: Naturally deposited non-rock earthen materials.

Stormwater Runoff: Water originating from rainfall and other precipitation.

Topsoil: The weathered surface soil, usually including the organic layer, in which plants have most of their roots.

Watercourse: A channel, natural depression, slough, artificial channel, gulch, arroyo, stream, creek, pond, reservoir, or lake in which storm runoff and flood water flows either regularly or intermittently, including major drainageways for carrying urban storm runoff.