Kurtis J. Jones, P.E.
Vice-President

Perkins & Associates
Architects, Engineers & Surveyors
A Division of Crafton, Tull & Associates, Inc.

February 23, 2000

Mr. Jeff Pipkin
Russellville Economic Development Partnership, Inc.
708 West Main
Russellville, AR 72801

RE: East End Industrial Park
Drainage Study – Final Report
Project No. 007011-00

Dear Jeff:

We have completed overall drainage computations for the East End Industrial Park. Specifically, we have computed stormwater runoff computations for the 2-year through the 100-year frequency storm event for both existing (undeveloped) and future (fully developed) conditions.

The property currently owned by RedPi (including the Goody's site – Lot 3) discharges into two (2) separate drainage basins. Roughly half of the property (the western basin – basin "A") drains to the west into an unnamed tributary of *Whig Creek*, and the other half of the property (the eastern basin – basin "B") drains to the south into a railroad ditch along the south side of the basin that is an unnamed tributary of *Galla Creek*. The following is a summary of those drainage areas:

BASIN	REDPI OWNED PROPERTY	OTHER PROPERTY	TOTAL AREA
A	73 acres	267 acres	340 acres
B	91 acres	199 acres	290 acres

Runoff flows for the two basins were computed using the Corps of Engineers hydrologic modeling software, HEC-1. The computation point for the western basin ("A") was the

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box culvert structure under Tyler Road, and the computation point for the eastern basin ("B") was railroad ditch at the south border of the RedPi property (see the attached drainage basin map).

The following is a summary of the computed flows:

BASIN "A"

STORM FREQUENCY (years)	EXISTING RUNOFF (cfs)	PROPOSED RUNOFF (cfs)	INCREASE IN RUNOFF (cfs)
		(1)	(1)
2	251	318 / *258*	67 / *7*
10	532	619 / *542*	87 / *10*
25	695	789 / *706*	94 / *11*
50	847	945 / *858*	98 / *11*
100	981	1,083 / *993*	102 / *12*

BASIN "B"

STORM FREQUENCY (years)	EXISTING RUNOFF (cfs)	PROPOSED RUNOFF (cfs)	INCREASE IN RUNOFF (cfs)
		(1)	(1)
2	248	346 / *267*	98 / *19*
10	517	639 / *544*	122 / *27*
25	673	802 / *701*	129 / *28*
50	817	952 / *846*	135 / *29*
100	945	1,083 / *975*	138 / *30*

(1) Flows computed based on the Goody's development alone.

As indicated above, complete development of the RedPi property will result in a runoff increase of 102 cfs or 10.4% for the western basin ("A"), and 138 cfs or 14.6% for the eastern basin ("B"). The Goody's development alone will result in a runoff increase of 12 cfs or 1.2% for the western basin ("A"), and 30 cfs or 3.2% for the eastern basin ("B").

Please note that the actual runoff increases at the point of discharge from the Goody's site itself will be significantly greater than the values indicated above; however, due to differing peak times within the overall basins, the actual peaks at the points of computation are somewhat lower.

Based on our knowledge of the conditions downstream from the RedPi property, the increase caused by the development of the Goody's site will not cause any significant downstream drainage problems. However, the overall development of the area will significantly increase the downstream peak flows. Based on this data, we recommend that RedPi explore the option of requiring future developers to provide individual detention basins for their developments to limit runoff from their property to predevelopment rates.

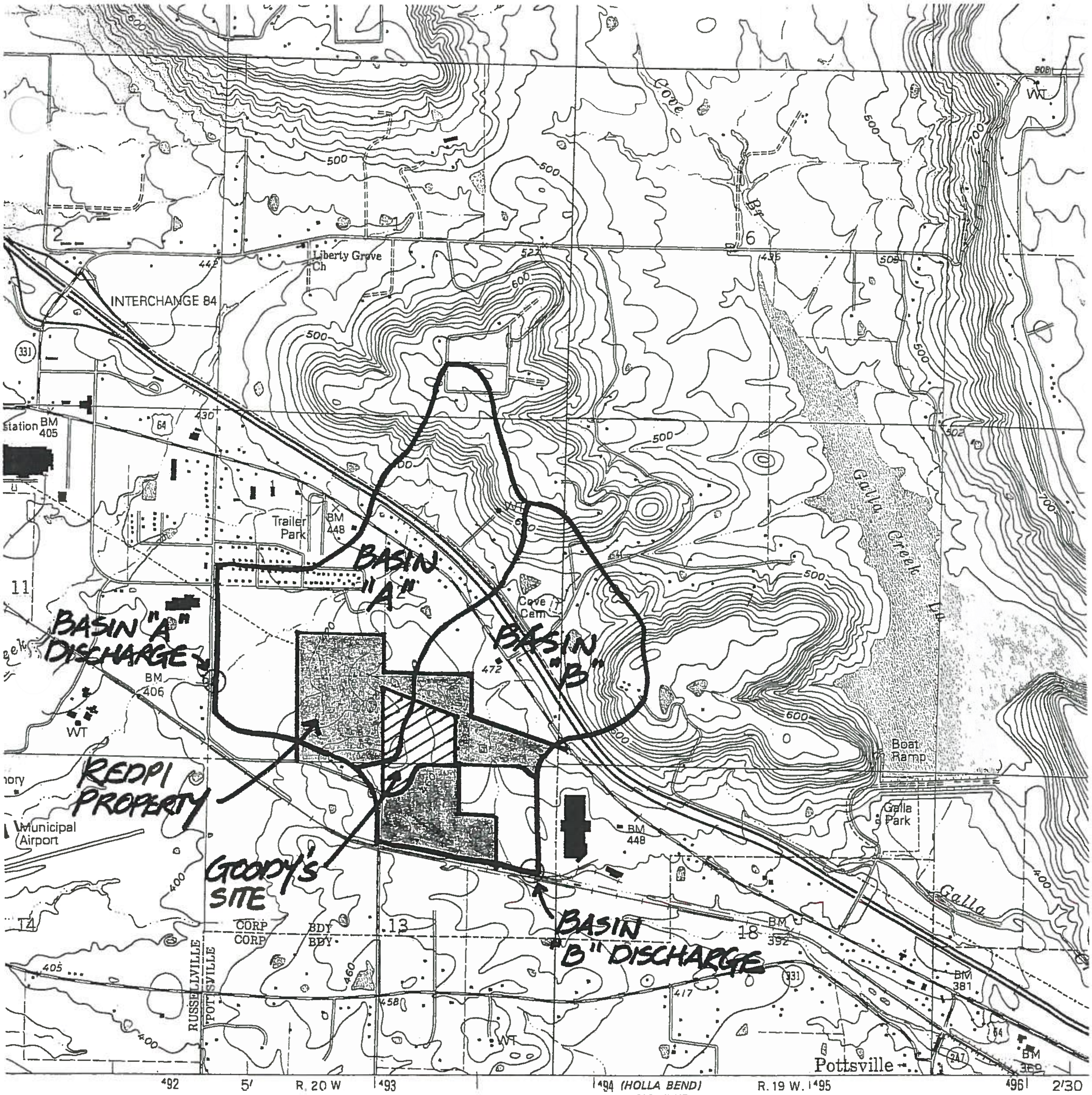
Attached is a copy of the stormwater detention policy and requirements from the City of Rogers, Arkansas Drainage Manual, which we developed for the City of Rogers a few years ago. Please review this information. It is possible that this policy (or one similar) could be adopted by RedPi with minimal alterations.

Should you have any questions regarding the information, please feel free to contact us at your convenience.

Sincerely,

PERKINS & ASSOCIATES
A DIVISION OF CRAFTON, TULL & ASSOCIATES, INC.

Kurtis J. Jones, P.E.



SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MN
GN
0°02'
1 MIL
3½°
62 MILS

UTM GRID AND 1993 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

COMPLIES WITH U.S. GEOLOGICAL SURVEY STANDARDS FOR SPATIAL ACCURACY - CLASS 2
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

REDPI DRAINAGE
PROJ NO 007011-00

HEC-1 INPUT SUMMARY

PROJECT: RedPi - East End Industrial Park
JOB NUMBER: 007011-00
DATE: 2/9/00
BY: K. Jones

BASIN NO.	AREA (AC)	AREA (SQ MI)	LENGTH(L) (FT)	AVG. BASIN SLOPE (Y) (%)	(1) RCN	S	T (LAG) (HR)
Predevelopment							
A	340	0.53125	6500	3.5	80	2.500	0.7593
B	290	0.45313	5600	4.3	80	2.500	0.6080
Postdevelopment - Total development of RedPi property							
A	340	0.53125	6500	3.5	83.2	2.019	0.6847
B	290	0.45313	5600	4.3	84.7	1.806	0.5209
Postdevelopment - Development of Goody's site only							
A	340	0.53125	6500	3.5	80.4	2.438	0.7498
B	290	0.45313	5600	4.3	81.1	2.330	0.5872

(1) Predominant soil types are Mountainburg (hydrologic group D), Linker (hydrologic group C), Leadvale (hydrologic group C), Enders (hydrologic group C), and Taft (hydroligic group C).

DRAFT
May 18, 2000

STORMWATER MANAGEMENT AND DRAINAGE ORDINANCE

AN ORDINANCE ADOPTING REGULATIONS DESIGNED TO LESSEN OR AVOID HAZARDS TO PERSONS AND PROPERTY CAUSED BY INCREASED STORM WATER RUNOFF OR BY OBSTRUCTION TO DRAINAGE, AND TO OTHERWISE PROMOTE THE PUBLIC HEALTH, SAFETY AND GENERAL WELFARE.

ARTICLE I. GENERAL PROVISIONS

SECTION A. Title: purpose

1. The provisions of this ordinance shall constitute and be known as the "Stormwater Management Ordinance for the City of Russellville, AR."
2. The purpose of this Ordinance is to protect, maintain, and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased stormwater runoff associated with both future land development and existing developed land within the City. Proper management of stormwater runoff will minimize damage to public and private property, ensure a functional drainage system, reduce local flooding, maintain as nearly as possible the pre-developed runoff characteristics of the area, and facilitate economic development while mitigating associated flooding and drainage impacts.
3. The application of this Ordinance and the provisions expressed herein shall be the minimum stormwater management requirements and shall not be deemed a limitation or repeal of any other powers granted by State statute. In addition, if site characteristics indicate that complying with these minimum requirements will not provide adequate designs or protection for local property or residents, it is the designer's responsibility to exceed the minimum requirements as necessary. The City Engineer or designee shall be responsible for the coordination and enforcement of the provisions of this ordinance.

SECTION B. Definitions

For the purpose of this Ordinance, the following terms, phrases and words, and their derivatives, shall have the meaning given herein:

1. As-built plan shall mean a set of engineering or site drawings that delineate the specific permitted stormwater management facility as actually constructed.
2. Best management practices shall mean a wide range of management procedures, schedules of activities, prohibitions on practices, and other management practices which have been demonstrated to effectively control the quality and/or quantity of stormwater runoff and which are compatible with the planned land use.
3. City Engineer shall mean the duly designated Head of the Engineering Department or department of public works, or his duly authorized agent.
4. City Engineering Department shall mean the department responsible for all stormwater management activities and implementation of the provisions of this ordinance.

5. Cross-drain culvert shall mean a culvert located under a roadway.
6. Design report shall mean the report that accompanies the Stormwater Management Plan and includes data used for engineering analysis, results of all analysis, design and analysis calculations (including input files and results obtained from computer programs), and other engineering data that would assist the City Engineer in evaluating proposed stormwater management facilities.
7. Designer shall mean a professional who is permitted to prepare plans and studies required by this ordinance.
8. Detention structure shall mean a permanent stormwater management structure whose primary purpose is to temporarily store stormwater runoff and release the stored runoff at controlled rates.
9. Development should generally mean any of the following actions undertaken by a public or private individual or entity:
   - the division of a lot, tract or parcel of land into two (2) or more lots, plots, sites, tracts, parcels or other divisions by plat or deed, or
   - any land change, including, without limitation, clearing, tree removal, grubbing, stripping, dredging, grading, excavating, transporting and filling of land.
10. Develop land shall mean to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.
11. Develop land use conditions shall mean the land use conditions according to the current City Land Use Map or proposed development plan.
12. Easement shall mean a grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.
13. Erosion shall mean the wearing away of land surface by the action of wind, water, gravity, ice, or any combination of those forces.
14. Erosion and sediment control shall mean the control of solid material, both mineral and organic, during a land disturbing activity to prevent its transport out of the disturbed area by means of wind, water, gravity, or ice.
15. Existing land use conditions shall mean the land use conditions existing at the time of the most recent official aerial photography available from the City.
16. Four percent annual chance (4%) storm shall mean a storm that is capable of producing rainfall expected to have a 4% chance of being equaled or exceeded in any given year.
17. Grading shall mean excavating, filling (including hydraulic fill), or stockpiling of earth material, or any combination thereof, including the land in its excavated or filled condition.
18. Impervious shall mean the condition of being impenetrable by water.
19. Imperviousness shall mean the degree to which a site is impervious.
20. Infiltration shall mean the passage or movement of water through the soil profile.
21. Interior culvert shall mean a culvert that is not located under a roadway.
22. Land disturbing activity shall mean any use of the land by any person that results in a change in the natural cover or topography that may cause erosion and contribute to sediment and alter the quantity of stormwater runoff.
23. Maintenance shall mean any action necessary to preserve stormwater management facilities in proper working condition, in order to serve the intended purposes set forth in Article I of this Ordinance and to prevent structural failure of such facilities. Maintenance shall not

include actions taken solely for the purpose of enhancing the aesthetics associated with stormwater management facilities.

24. Natural waterways shall mean waterways that are part of the natural topography. They usually maintain a continuous or seasonal flow during the year and are characterized as being irregular in cross-section with a meandering course. Construction channels such as drainage ditches shall not be considered natural waterways.
25. Nonerodible shall mean a material, e.g., natural rock, riprap, concrete, plastic, etc., that will not experience surface wear due to natural forces of wind, water, ice, gravity, or a combination of those forces.
26. On-site stormwater management shall mean the design and construction of a facility necessary to control stormwater runoff within and for a single development.
27. One percent annual chance (1%) storm shall mean a storm that is capable of producing rainfall expected to have a 1% chance of being equaled or exceeded in any given year.
28. Person responsible for the land disturbing activity shall mean:
    a. the person who has or represents having financial or operational control over the land disturbing activity; and/or
    b. the landowner or person in possession or control of the land who directly or indirectly allowed the land disturbing activity or has benefited from it or who has failed to comply with any provision of this ordinance.
29. Post-development conditions shall mean the conditions which exist following the completion of the land disturbing activity in terms of topography, vegetation, or land use and rate, volume, or direction of stormwater runoff.
30. Pre-developed conditions shall mean those land use conditions that existed prior to the initiation of the land disturbing activity in terms of topography, vegetation, or land use and rate, volume, or direction of stormwater runoff.
31. Preliminary plat shall mean the preliminary plat of a residential subdivision submitted pursuant to the City's Subdivision Regulations.
32. Record survey shall mean a final field survey which locates the visible surface features of a constructed stormwater facility on the ground, but without locating non-visible or subsurface features such as the actual route and elevation of buried pipe.
33. Regional stormwater management shall mean the design and construction of a facility necessary to control stormwater runoff within or outside a development and for one or more developments.
34. Registered Civil Engineer shall mean a civil engineer properly registered and licensed to conduct work within the State.
35. Registered Land Surveyor shall mean a land surveyor properly registered and licensed to conduct work within the State.
36. Registered Landscape Architect shall mean a landscape architect properly registered and licensed to conduct work within the State.
37. Responsible personnel shall mean any foreman, superintendent, or similar individual who is the on-site person in charge of land disturbing activities.
38. Retention structure shall mean a permanent structure whose primary purpose is to permanently store a given volume of stormwater runoff. Release of the given volume is by infiltration and/or evaporation.
39. Sediment shall mean solid particulate matter, both mineral and organic, that has been or is being transported by water, air, ice, or gravity from its site of origin.

40. Stabilization shall mean the installation of vegetative or structural measures to establish a soil cover to reduce soil erosion by stormwater runoff, wind, ice and gravity
41. Stage work or stage construction shall mean a plan for the staged construction of stormwater facilities where portions of the facilities will be constructed as different stages of the proposed development are started or completed.
42. Stormwater Concept Plan shall mean the overall proposal for a storm drainage system, including stormwater management structures, and supporting documentation as specified in the Stormwater Management Design Manual, for each proposed private or public development to the extent permitted by law. Also included are the supporting engineering calculations and results of any computer analysis, if necessary.
43. Stormwater drainage system shall mean any inlet structure, ditch, gutter adjacent to curb or any other means of conveying stormwater.
44. Stormwater management shall mean the collection, conveyance, storage, treatment, and disposal of stormwater runoff in a manner to minimize accelerated channel erosion and/or increased flood damage, and in a manner to enhance and ensure the public health, safety, and general welfare, which shall include a system of vegetative or structural measures, or both, that control the increased volume and rate of stormwater runoff caused by manmade changes to the land.
45. Stormwater Management Design Manual shall mean the manual of design, performance, and review criteria for stormwater management practices, prepared under the direction of the City Engineer. Copies of this manual can be obtained from the City Engineering Department.
46. Stormwater management facilities shall mean those structures and facilities that are designed for the collection, conveyance, storage, and disposal of stormwater runoff into and through the drainage system.
47. Stormwater Management Plan (SMP) shall mean the set of drawings and other documents that comprise all of the information and specifications for the drainage systems, structures, concepts and techniques that will be used to control stormwater as required by this Ordinance and the Stormwater Management Design Manual. Also included are the supporting engineering calculations and results of any computer analysis.
48. Stormwater management qualitative control shall mean a system of vegetative, structural, or other measures that reduce or eliminate pollutants that might otherwise be carried by stormwater runoff.
49. Stormwater runoff shall mean the direct response of a watershed to precipitation and includes the surface and subsurface runoff that enters a ditch, stream, storm drain or other concentrated flow during and following the precipitation.
50. Subdivision shall mean (1) The creation of one or more new streets, alleys or other public ways; or, the changing of any rights-of-way of any existing streets, alleys or other public ways. (2) Any division or redivision of lot, tract, or parcel or land, regardless of its prospective use. Such subdivision may be accomplished by platting or by description of metes and bounds or otherwise into two (2) or more lots or other divisions for sale or improvement. The following are not defined as subdivisions:
    a. The combination or recombination of portions of previously platted lots where the total

number of lots is not increased and the resultant lots are in accordance with the rules and regulations contained in the City's Subdivision Regulations and with the City's Zoning Ordinance.

b. Division or sale of land by judicial decree which shall not be deemed a division for purposes of this ordinance.
c. The acquisition of land for the purpose of widening or opening of streets when the acquisition and work is done by the City, State, or other governmental agency.
d. The division of land into parcels greater than five (5) acres where no street right-of-way dedication is involved.

50. Swale shall mean a structural measure with a lining of grass, riprap, or other materials which can function as a detention structure and convey stormwater runoff without causing erosion.
51. Variance shall mean the modification of the minimum stormwater management requirements for specific circumstances where strict adherence of the requirements would result in unnecessary hardship and not fulfill the intent of this ordinance.
52. Waiver shall mean the relinquishment from stormwater management requirements by the City Engineer for a specific land disturbing activity on a case-by-case review basis.
53. Water quality shall mean those characteristics of stormwater runoff from a land disturbing activity that relate to the physical, chemical, biological, or radiological integrity of water.
54. Water quantity shall mean those characteristics of stormwater runoff that relate to the rate and volume of the stormwater runoff to downstream areas resulting from land disturbing activities.
55. Watershed shall mean the drainage area contributing stormwater runoff to a single point.

SECTION C. Scope of Ordinance

No person shall develop any land, realign any channel, place fill or debris in the channel or in any storm drainage system, without having provided for appropriate stormwater management measures that control or manage runoff, in compliance with this Ordinance, unless exempted in Article I, Section D below.

No person shall dump debris, solid waste, yard waste, fill or any other waste material in any storm drainage system, including an open channel, ditch or a gutter adjacent to a City street.

SECTION D. Exemptions

All construction, subdivision approvals or remodeling activities shall have a stormwater management and drainage plan approved before a building permit is issued or subdivision is approved except for the following:

- One - new or existing single family structure unless the impervious areas of the development exceed 40,000 square feet.
- One - new or existing duplex family structure unless the impervious areas of the development exceed 40,000 square feet.

- One - existing commercial or industrial structure where additional structural improvements or additional impervious areas are less than 500 square feet.
- Residential subdivisions which were approved prior to the effective date of these regulations are exempt from these requirements. Development of new phases of existing subdivisions which were not previously approved shall comply with the provisions of these regulations.

SECTION E. Stormwater Management Design Manual

To assist in the design and evaluation of stormwater management facilities in the City, a Stormwater Management Design Manual will be developed. Recommended design procedures and criteria are presented for conducting hydrologic and hydraulic evaluations. Although the intention of the manual is to establish uniform design practices, it neither replaces the need for engineering judgment nor precludes the use of information not presented. Other accepted engineering procedures may be used to conduct hydrologic and hydraulic studies if approved by the City Engineer.

ARTICLE II. STORM WATER CONCEPT AND PRELIMINARY DEVELOPMENT PLANS

SECTION A. Scope of development plans

1. a. In developing plans for residential subdivisions, individual lots in a residential subdivision development shall not be considered to be separate land disturbing activities and shall not require individual permits. Instead the residential subdivision development, as a whole, shall be considered to be a single land disturbing activity. Hydrologic parameters that reflect the ultimate subdivision development shall be used in all engineering calculations.

   b. If individual lots or sections in a residential subdivision are being developed by different property owners, all land disturbing activities related to the residential subdivision shall be covered by the approved Stormwater Management Plan for the residential subdivision. Individual lot owners or developers shall sign a certificate of compliance that all activities on that lot will be carried out in accordance with the approved Stormwater Management Plan for the residential subdivision.

2. Unless otherwise deemed necessary by the City Engineer, for land disturbing activities involving two and one half (2.5) acres or less of actual land disturbance or development of less than than 40,000 square feet of impervious area which are not part of a larger common plan of development or sale, the person responsible for the land disturbing activity shall submit a simplified stormwater management control plan meeting the requirements listed below. This plan does not require preparation or certification by the designers specified in Section K of Article II unless deemed necessary by the City Engineer. The requirements for the simplified stormwater management control plan include:

   a. A narrative description of the stormwater management facilities to be used.
   b. A general description of topographic and soil conditions of the development site.

c. A general description of adjacent property and a description of existing structures, buildings, and other fixed improvements located on surrounding properties.

d. A sketch plan to accompany the narrative which shall contain:
   - a site location drawing of the proposed project, indicating the location of the proposed project in relation to roadways, jurisdictional boundaries, streams and rivers;
   - the boundary lines of the site on which the work is to be performed;
   - all areas within the site which will be included in the land disturbing activities shall be identified and the total disturbed area calculated;
   - a topographic map of the site;
   - anticipated starting and completion dates of the various stages of land disturbing activities and the expected date the final stabilization will be completed.
   - the location of temporary and permanent vegetative and structural stormwater management control measures.

e. Stormwater Management Plans shall contain certification by the persons responsible for the land disturbing activity that the land disturbing activity will be accomplished pursuant to the plan.

f. Stormwater Management Plans shall contain certification by the person responsible for the land disturbing activity of the right of the City Engineer to conduct on-site inspections.

3. For land disturbing activities disturbing more than two and one-half (2.5) acres or development of greater than 40,000 square feet of impervious area, or as deemed necessary by the City Engineer, the requirements of Article II, Sections B - K shall apply.

SECTION B. Stormwater Concept and Stormwater Management Plans

1. A Stormwater Concept Plan for each development shall be submitted for review by the City Engineer prior to submission of the Stormwater Management Plan and construction plans for the entire development, or any portion thereof.
2. All preliminary plats of the development shall be consistent with the Stormwater Concept Plan required in Paragraph 1 above.
3. Upon approval of the concept plan, the applicant shall submit a final Stormwater Management Plan (as part of the construction plans) to the City Engineer for review and approval; provided that the City Engineer may accept and submit into the review process a Stormwater Concept Plan if it identifies the location and type of facilities to be constructed in sufficient detail to accurately estimate construction costs and the City Engineer determines that a Stormwater Management Plan is not needed. If accepted under this provision, the Stormwater Concept Plan then becomes the Stormwater Management Plan for this development.
4. Should any Stormwater Management Plan involve any stormwater management facilities or land to be dedicated to public use, the same information shall also be submitted for review and approval to the department having jurisdiction over the land or other appropriate departments or agencies identified by the City Engineer for review and approval. This Stormwater Management Plan shall serve as the basis for all subsequent construction.
5. The Stormwater Concept Plan may be reviewed, if needed, with the designer, after City review, where it will be approved, approved with changes, or rejected. If rejected, changes,

additional analysis, or other information needed to approve the next submittal of the concept plan shall be identified. The City review of the Stormwater Concept Plan will be completed within ten (10) working days from and after the receipt of the plan.

6. Within fifteen (15) working days from and after the receipt of the Stormwater Management Plan, the City Engineer shall issue a decision approving, rejecting or conditionally approving the plan with modification.

SECTION C. Stormwater Management requirements

1. For purposes of obtaining approval of a Stormwater Management Plan, a plan for the site meeting the requirements established in the Stormwater Management Design Manual shall be submitted to the City Engineer for review and approval. All design criteria plan details shall be in conformance with the Stormwater Management Design Manual.
2. Construction of stormwater management facilities shall be in conformance with the approved Stormwater Management Plan for the site.
3. The Stormwater Management Plan, including on-site stormwater detention facilities, shall be reviewed and approved by the City Engineer prior to issuance of building permits for the site. The improvements shall be constructed prior to the issuance of final certificates of occupancy.
4. For sites on which privately owned and maintained stormwater detention and/or conveyance facilities are located, the property owner shall be responsible for the following:
   a. All future grading, repairs, and maintenance.
   b. Maintenance of the minimum stormwater detention volume, as approved by the City Engineer.
   c. Maintenance of the detention basin control structure(s) and discharge pipe(s) to insure the maximum theoretical stormwater release rate, as approved by the City Engineer, is not increased.
5. The property owner shall place no fill material, or erect any buildings, obstructions, or other improvements on the area reserved for stormwater detention purposes, unless otherwise approved by the City Engineer.
6. The property owner shall dedicate to the City of Russellville, by instrument or final platting, any property on which public stormwater detention basins will be located. Ingress-egress easements for maintenance of public facilities shall be provided prior to final site approval.
7. All public storm sewers shall be dedicated to the City.
8. All stormwater drainage facilities serving more than one lot which are not dedicated to the city shall be covered under a drainage easement. Such easements shall grant to the City the authority for operation, maintenance, and inspection.
9. Upon determination that a site is not in compliance with these regulations, the City Engineer may issue an order to comply. The order shall describe the problem and specify a date whereby the work must be completed, and indicate the penalties to be assessed for further noncompliance.
10. Except as provided in this Ordinance, no person shall engage in construction of stormwater management facilities, unless a Stormwater Management Plan has been reviewed and approved by the City Engineer.
11. Compliance – Compliance with this Section is achieved when:
    a. The site plan has been approved.

b. The approved stormwater drainage facilities have been implemented and are demonstrably in conformance with the approved site plan and Stormwater Management Design Manual.

12. Coordination with Building Permit – It is the intent of this Section that review of the stormwater drainage system be carried out simultaneously with the review of the request for a building permit. The site plan required under this chapter may be submitted in a form which will satisfy the site plan requirements set forth in the Building Code, the Land Subdivision and Development Code and the Zoning Ordinance.
13. Other Permits – Before starting on construction regulated by this chapter, the applicant shall comply with the requirements set forth in other applicable ordinances with respect to submission and approval of subdivision plats, plans of improvements, building permits, inspections, appeals and similar matters, as well as requirements of state statutes and the regulations of any Department of the State of Arkansas.
14. Alternatives to On-Site Detention
    a. Alternative Methods – where on-site detention is deemed inappropriate due to local topographical or other physical conditions, alternate methods for accommodating increases in stormwater runoff shall be permitted. The methods may include:
        1) Off-site detention or comparable improvements.
        2) In-lieu monetary contributions for drainage system improvements by the City. Channel improvements shall only be used if they are an integral part of a detailed watershed study.
    b. In-Lieu Contributions to Regional or Sub-Regional Detention – An owner may contribute to drainage system improvements to be constructed in lieu of constructing on-site detention. However, no in-lieu contributions are allowed when existing flooding occurs downstream from the development, or if the development will cause downstream flooding.
    c. In-Lieu Fees – The in-lieu fee contribution shall be based upon an amount of $15,000 per Acre-Foot of stormwater storage.
    d. Excess Stormwater Storage Credit – An owner may receive credit for excess stormwater storage (in Acre-Feet) created on one site that may be applied to another site within the same watershed. The transfer of storage volume credit (in Acre-Feet) shall not be allowed if the site where credited storage is proposed to be transferred has an existing flooding condition downstream or the proposed development will produce downstream flooding.
    e. Drainage System Improvements – Monies contributed by the owners as above provided shall be used for the construction of drainage improvements; facilities thereon will be financed by the City.

SECTION D. Permit requirements

1. No final occupancy permit shall be issued without the following:
    a. Recorded easements for stormwater management facilities.
    b. Receipt of an as-built plan, which includes a certification of the storm drainage system.
2. No site grading permit shall be issued or modified without the following:
    a. Right of entry for emergency maintenance if necessary.
    b. Right of entry for inspections.

c. Any off-site easements needed.

d. An approved Stormwater Concept Plan or Stormwater Management Plan, as appropriate.

3. The approved Stormwater Management Plan shall contain certification by the applicant that all land clearing, construction, development and drainage will be done according to the Stormwater Management Plan or previously approved revisions. Any and all site grading permits may be revoked at any time if the construction of stormwater management facilities is not in strict accordance with approved plans.
4. In addition to the plans and permits required from the City, applicants shall obtain all state and federal permits required for the proposed development.

SECTION E. Fees

A list of fees for plan review and other fees associated with this ordinance can be obtained from the City Engineering Department. Said fees shall be in accordance with the fees set by the Zoning Ordinance or the Land Subdivision and Development Code.

SECTION F. Permit suspension and revocation

1. A site grading permit may be suspended or revoked if one or more of the following violations have been committed:
   a. Violation(s) of the conditions of the Stormwater Management Plan approval;
   b. Construction not in accordance with the intent of the approved plans;
   c. Non-compliance with correction notice(s) or stop work orders(s); or
   d. The existence of an immediate danger in a downstream area in the judgment of the City Engineer.

   If one or more of these conditions is found, a written notice of violations shall be served upon the owner or authorized representative and an immediate stop-work order may be issued. The notice shall set forth the measures necessary to achieve compliance with the plan. Correction of these violations must be started immediately or the owner shall be deemed in violation of this Ordinance.

SECTION G. Minimum runoff control requirements

1. The minimum stormwater control requirements shall provide management measures necessary to accomplish the following:
   a. Install stormwater management facilities to limit the 4% annual chance storm developed peak discharge rates to pre-developed peak discharge rates. The design of these facilities shall be based on procedures contained in the Stormwater Management Design Manual or approved by the City Engineer.
   b. The requirements, or portions thereof, of item (a.) may be waived by the City Engineer if it can be shown by detailed engineering calculations and analysis which are acceptable to the City Engineer that one of the following exists:
      1) the installation of stormwater management facilities would have insignificant effects on reducing downstream flood peaks; or

2) stormwater management facilities are not needed to protect downstream developments and the downstream drainage system has sufficient capacity to receive any increase in runoff for the design storm; or
3) it is not necessary to install stormwater management facilities to control developed peak discharge rates at the exit to a proposed development and installing such facilities would increase flood peaks at some downstream locations; or
4) the City Engineer determines that stormwater management facilities are not needed to control developed peak discharge rates and installing such facilities would not be in the best interest of the City.

c. The requirements, or portions thereof, of item (a.) may not be waived if the City Engineer determines that not controlling downstream flood peaks would increase known flooding problems, or exceed the capacity of the downstream drainage system.
d. A waiver shall only be granted after a written request is submitted by the applicant containing descriptions, drawings, and any other information that is necessary to evaluate the proposed land disturbing activity. A separate written waiver request shall be required if there are subsequent additions, extensions, or modifications which would alter the approved stormwater runoff characteristics to a land disturbing activity receiving a waiver. The City Engineer will conduct a review of the request for a waiver within ten (10) working days. All waivers issued must be signed by the City Engineer and the Mayor or acting representative of the Mayor.
e. Discharge velocities shall be reduced to provide a nonerosive velocity flow from a structure, channel, or other control measure or the velocity of the 4 percent annual chance storm runoff in the receiving waterway prior to the land disturbing activity, whichever is greater.

2. For all stormwater management facilities, a hydrologic-hydraulic study shall be done showing how the drainage system will function with and without the proposed facilities. Existing land use data shall be taken from the most recent aerial photograph and field checked and updated. For such studies the following land use conditions shall be used:
   a. For the design of the facility outlet structure, use developed land use conditions for the area within the proposed development and existing land use conditions for upstream areas draining to the facility.
   b. For any analysis of flood flows downstream from the proposed facility, use existing land use conditions for all downstream areas.
   c. All stormwater management facilities' emergency spillways shall be checked using the 1% annual chance storm and routing flows through the facility and emergency spillways. For this analysis, developed land use conditions shall be used for all areas within the analysis.
   d. If accepted for municipal maintenance, the effects of existing upstream detention facilities can be considered in the hydrologic-hydraulic study.

SECTION H. Stormwater management facilities

1. Stormwater management facilities may include both structural and nonstructural elements. Natural swales and other natural runoff conduits shall be retained where practicable.
2. Where additional stormwater management facilities are required to satisfy the minimum control requirements, the following measures are examples of what may be used:

a. Stormwater detention structures (dry basins);
b. Stormwater retention structures (wet ponds);
c. Facilities designed to encourage overland flow, slow velocities of flow, and flow through buffer zones;
d. Infiltration practices.

3. Where detention and retention structures are used, designs which consolidate these facilities into a limited number of large structures will be preferred over designs which utilize a large number of small structures.
4. Stormwater Management Plans can be rejected by the City Engineer if they incorporate structures and facilities that will demand considerable maintenance, will be difficult to maintain, or utilize numerous small structures if other alternatives are physically possible.
5. The drainage system and all stormwater management structures within the City (including both public and private portions) will be designed to the same engineering and technical criteria and standards. The City Engineering Department's review will be the same whether the portion of the drainage system will be under public or private control or ownership.
6. All stormwater management measures shall be designed in accordance with the design criteria contained in the Stormwater Management Design Manual using procedures contained in this manual or procedures approved by the City Engineer.

SECTION I. Plan requirements

Stormwater Management Plans shall include as a minimum the following.

1. A vicinity map indicating a north arrow, scale, boundary lines of the site, and other information necessary to locate the development site.
2. The existing and proposed topography of the development site except for individual lot grading plans in single family subdivisions.
3. Physical improvements on the site, including present development and proposed development.
4. Location, dimensions, elevations, and characteristics of all stormwater management facilities.
5. All areas within the site which will be included in the land disturbing activities shall be identified and the total disturbed area calculated.
6. The location of temporary and permanent vegetative and structural stormwater management control measures.
7. An anticipated starting and completion date of the various stages of land disturbing activities and the expected date the final stabilization will be completed.
8. Stormwater Management Plans shall include designation of all easements needed for inspection and maintenance of the drainage system and stormwater management facilities. As a minimum, easements shall have the following characteristics:
   a. Provide adequate access to all portions of the drainage system and structures.
   b. Provide sufficient land area for maintenance equipment and personnel to adequately and efficiently maintain the system with a minimum of ten (10) feet along both sides of all drainage ways, streams, channels, etc., and around the perimeter of all detention and retention facilities, or sufficient land area for equipment access for maintenance of all stormwater management facilities. This distance shall be measured from the top of the bank or toe of the downstream side of the dam whichever is applicable.

c. Restriction on easements shall include prohibiting all fences and structures which would interfere with access to the easement areas and/or the maintenance function of the drainage system.

9. To improve the aesthetic aspects of the drainage system, a landscape plan for all portions of the drainage system shall be part of the Stormwater Management Plan. This landscape plan shall address the following:
   a. Tree saving and planting plan.
   b. Types of vegetation that will be used for stream bank, stabilization, erosion control, sediment control, aesthetics, and water quality improvement.
   c. Any special requirements related to the landscaping of the drainage system and efforts necessary to preserve the natural aspects of the drainage system.
   d. All plans shall be submitted in a scale of 1" = 100' or larger. (Example 1" = 60', 50', 40' etc.)

SECTION J. Plan hydrologic criteria

The hydrologic criteria to be used for the Stormwater Concept And Stormwater Management Plans shall be as follows:

1. Four percent (4%) annual chance design storm for all cross-drain culverts and drainage designs.
2. Ten percent (10%) annual chance design storm for drainage design for all interior culverts.
3. Four percent (4%) annual design storm for all detention and retention basins using procedures contained in the Stormwater Management Design Manual or approved by the City Engineer.
4. All hydrologic analysis will be based on land use conditions as specified in Article II Section G 2.
5. For the design of storage facilities, a secondary outlet device or emergency spillway shall be provided to discharge the excess runoff in such a way that no danger of loss of life or facility failure is created. The size of the outlet device or emergency spillway shall be designed to pass the one percent (1%) chance storm as a minimum requirement.
6. All storms listed above are to be analyzed assuming a 24-hour duration.

SECTION K. Professional registration requirements

Stormwater concept and Stormwater Management Plans and design reports that are incidental to the overall or ongoing site design shall be prepared, certified, and stamped/sealed by a qualified registered Professional Engineer, Land Surveyor, or Landscape Architect, as applicable, using acceptable engineering standards and practices. All other stormwater concept and Stormwater Management Plans and design reports shall be prepared, certified, and stamped/sealed by a qualified registered Professional Engineer, using acceptable engineering standards and practices.

The engineer, surveyor, or landscape architect shall perform services only in areas of his/her competence, and shall undertake to perform engineering or land surveying assignments only when qualified by education and/or experience in the specific technical field. In addition, the engineer, surveyor, or landscape architect must verify that the plans have been designed in

accordance with this ordinance and the standards and criteria stated or referred to in this ordinance.

ARTICLE III. OWNERSHIP AND CITY PARTICIPATION

SECTION A. Ownership of stormwater management facilities

1. All stormwater management facilities shall be privately owned and maintained unless the City accepts the facility for City ownership and maintenance. The owner of all private facilities shall grant to the City, a perpetual, non-exclusive easement which allows for public inspection and emergency repair.
2. All stormwater management measures relying on designated vegetated areas or special site features shall be privately owned and maintained as defined on the Stormwater Management Plan.
3. Regional stormwater management facilities will be publicly owned and/or maintained.
4. The dedication of any property and/or facilities to the City for public use and maintenance must be approved by the City Council in ordinance form and shall be filed with the Pope County Circuit Clerk.

SECTION B. City participation

When the City Engineer determines that additional storage capacity beyond that required by the applicant for on-site stormwater management is necessary in order to enhance or provide for the public health, safety and general welfare, to correct unacceptable or undesirable existing conditions or to provide protection in a more desirable fashion for future development, the City Engineer may:

a. Require that the applicant grant any necessary easements over, through or under the applicant's property to provide access to or drainage for such a facility;
b. Require that the applicant attempt to obtain from the owners of property over, through or under where the stormwater management facility is to be located, any easements necessary for the construction and maintenance of same (and failing the obtaining of such easement the City may, at its option, assist in such matter by purchase, condemnation, dedication or otherwise, and subject to (c) below, with any cost incurred thereby to be paid by the City); and/or
c. Participate financially in the construction of such facility to the extent that such facility exceeds the required on-site stormwater management as determined by the City Engineer. To implement this provision both the City and developer must be in agreement with the proposed facility that includes the additional storage capacity and jointly develop a cost sharing plan which is agreeable to all parties.

ARTICLE IV. MAINTENANCE, CONSTRUCTION AND INSPECTION

SECTION A. Maintenance

1. Any stormwater discharge control facility which services a single lot or commercial and

industrial development shall be privately owned and maintained; provided, however, the owner thereof shall grant to the City, a perpetual, non-exclusive easement which allows for public inspection and emergency repair, in accordance with the terms of the maintenance agreement set forth in Article IV, Section B, below.

2. All regional stormwater discharge control facilities, identified on municipal stormwater discharge control masterplans, shall be publicly owned and/or maintained.
3. All other stormwater discharge control facilities shall be publicly owned and/or maintained only if accepted for maintenance by the City.
4. Private maintenance requirements shall be a part of the deed to the affected property.

SECTION B. Maintenance agreement (privately owned facilities only)

1. A proposed inspection and maintenance agreement shall be submitted to the City Engineer for all private on-site stormwater discharge control facilities prior to the approval of the Stormwater Management Plan. Such agreement shall be in form and content acceptable to the City Engineer and shall be the responsibility of the private owner. Such agreement shall provide for access to the facility by virtue of a non-exclusive perpetual easement in favor of the City at reasonable times for regular inspection by the City Engineer. The agreement will identify who will have the maintenance responsibility. Possible arrangements for this maintenance responsibility might include the following:
   - Use of homeowner associations,
   - Private maintenance by development owner(s), or
   - Contracts with private maintenance companies.

   All maintenance agreements shall contain without limitation the following provisions:
   a. A description of the property on which the stormwater management facility is located and all easements from the site to the facility;
   b. Size and configuration of the facility;
   c. A statement that properties which will be served by the facility are granted rights to construct, use, reconstruct, repair, and maintain access to the facility;
   d. A statement that each lot served by the facility is responsible for repairs and maintenance of the facility and any unpaid ad valorem taxes, public assessments for improvements, and unsafe building and public nuisance abatement liens charged against the facility, including all interest charges together with attorney fees, cost and expenses of collection. If an association is delegated these responsibilities, then membership into the association shall be mandatory for each parcel served by the facility and any successive buyer, the association shall have the power to levy assessments for these obligations, and that all unpaid assessments levied by the association shall become a lien on the individual parcel; and
   e. A statement that no amendments to the agreement will become effective unless approved by the City.
2. The agreement shall provide that preventive maintenance inspections of stormwater management facilities may be made by the City Engineer, at his option. Without limiting the generality of the foregoing, the City Engineer's inspection schedule may include an inspection during the first year of operation and once every year thereafter, and after major storm events.
3. Inspection reports shall be maintained by the City Engineer.

4. The agreement shall provide that if, after an inspection, the condition of a facility presents an immediate danger to the public health, safety or general welfare because of unsafe conditions or improper maintenance, the City shall have the right, but not the duty, to take such action as may be necessary to protect the public and make the facility safe. Any cost incurred by the City shall be paid by the owner.
5. The agreement shall be recorded by the owner in the Register of Deeds prior to the final inspection and approval.
6. The agreement shall provide that the City Engineer shall notify the owner(s) of the facility of any violation, deficiency, or failure to comply with this Ordinance. The agreement shall also provide that upon a failure to correct violations requiring maintenance work, within ten (10) days after notice thereof, the City Engineer may provide for all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the costs of the work performed by the City Engineer pursuant to this subsection and subsection 4 above and there shall be a lien on all property of the owner which property utilizes or will utilize such facility in achieving discharge control, which lien, when filed in the Register of Deeds, shall have the same status and priority as liens for ad valorem taxes. Should such a lien be filed, portions of the affected property may be released by the City following the payments by the owner of such owner's pro-rata share of the lien amount based upon the acreage to be released with such release amount to be determined by the City Engineer, in his reasonable discretion.
7. All agreements must be signed by the property owner, the engineer that prepared the plans for the facility, the City Engineer and the Mayor.
8. Failure to comply with the terms of this agreement shall be a violation of this ordinance.

SECTION C. Construction and inspection

1. Prior to the approval of the Stormwater Management Plan, the applicant shall submit a proposed staged construction and inspection control schedule. This plan shall indicate a phase line for approval; otherwise the construction and inspection control schedule will be for the entire drainage system.
2. No stage work, related to the construction of stormwater management facilities, shall proceed until the next preceding stage of work, according to the sequence specified in the approved staged construction and inspection control schedule, is inspected and approved.
3. Any portion of the work that does not comply with the Stormwater Management Plan shall be promptly corrected by the permittee.
4. The permittee shall notify the City Engineer before commencing any work to implement the Stormwater Management Plan and upon completion of the work.
5. The permittee shall provide an "as-built" plan certified by a registered professional (as outlined in Article II, Section J) to be submitted upon completing of the stormwater management facilities included in the Stormwater Management Plan. The registered professional shall certify that:
   a. The facilities have been constructed as shown on the "as-built" plan, and
   b. The facilities meet the approved Stormwater Management Plan and specifications or achieves the function for which they were designed.

6. A final inspection shall be conducted by the City Engineer upon completion of the work included in the approved Stormwater Management Plan to determine if the completed work is constructed in accordance with the plan.
7. The City Engineer shall maintain a file of inspection reports and provide copies of all inspection reports to the permittee that include the following:
   a. The date and location of the site inspection.
   b. Whether the approved plan has been properly implemented.
   c. Any approved plan deficiencies and any actions taken.
8. The City Engineer will notify the person responsible for the land disturbing activity in writing when violations are observed describing the following:
   a. Nature of the violation.
   b. Required corrective actions.
   c. The time period for violation correction.

ARTICLE V. MISCELLANEOUS PROVISIONS

SECTION A. Variances from requirements

1. The City Engineer may grant a variance from the requirements of this Ordinance if there are exceptional circumstances applicable to the site such that strict adherence to the provisions of the Ordinance will result in unnecessary hardship and not fulfill the intent of the Ordinance.
2. A written request for a variance shall be required and shall state the specific variance sought and the reasons, with supporting data, for their granting. The request shall include descriptions, drawings, calculations, and any other information that is necessary to evaluate the proposed variance.
3. Any substantial variance from the Stormwater Management Plan or concept plan shall be referred to all agencies that reviewed the original plan.
4. The City Engineer will conduct a review of the request for a variance within ten (10) working days. Any variance granted must contain the signature of the City Engineer and the Mayor.

SECTION B. Appeals

Any person aggrieved by a decision of the City Engineer (including any decision with reference to the granting or denial of a variance from the terms of this Ordinance) may appeal same by filing a written notice of appeal with the City Engineer within thirty (30) calendar days of the issuance of said decision by the City Engineer. The City Engineer can then reverse his/her decision or send this notice to the Appeals Board with comments.

The Appeals Board shall consist of five (5) members: the Mayor (Chairman), two Aldermen (chosen annually at the January City Council meeting), and two lay person members, residents of the City, appointed by the Mayor for a term of two years.

A notice of appeal shall state the specific reasons why the decision of the City Engineer is alleged to be in error and the City Engineer shall prepare and send to the Appeals Board and Appellant, within fifteen (15) days of receipt of the notice of appeal, a written response to said notice of appeal.

All such appeals shall be heard by the Appeals Board that is hereby granted specific authority to hear and determine such appeals in a quasi-judicial capacity. Said appeal shall be heard by the Appeals Board at its next regularly scheduled meeting date, not to exceed thirty (30) days after receipt of the notice of appeal, or at such other time as may be mutually agreed upon in writing by the Appellant and the Chairperson of the Appeals Board. The Appeals Board will then render a written decision within fifteen (15) days after the appeal has been heard.

Each party to the appeal shall be entitled to a hearing before the Appeals Board under judicial forms of procedure, at which hearing each party shall have the right to present evidence and sworn testimony of witnesses, to cross-examine witnesses, and to cause a transcription of the proceedings to be prepared.

Appeals Board deliberations shall be open to the public.

Should either party be dissatisfied with the decision of the Appeals Board, any appeal of said decision may be appealed to the Pope County Circuit Court.

SECTION C. Penalties

1. Upon determination that a violation of this ordinance has occurred the owner shall be given a written notice of the violations and the time in which to correct the deficiencies. The notice shall be prepared by the City Engineer or his designee, or the City Attorney.
2. If construction violations of the approved plan are occurring, an immediate stop-work order may be issued by the City Engineer. If the City issues a stop work order, the City must deliver a written list of reasons/deficiencies within 3 working days of the stop-work order.
3. Any person violating this ordinance or any part thereof, including failing to stop work upon order, shall upon conviction thereof, be fined not less than three hundred dollars nor more than five hundred dollars for each offense. Each separate interval of 24 hours, or every day, such violations shall be continued, committed or existing, shall constitute a new and separate offense and be punished, as aforesaid, for each separate period of violation.
4. The City Attorney may institute injunctive, mandamus, or other appropriate action or proceedings at law or equity for the enforcement of this Ordinance or to correct violations of this Ordinance, and any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

SECTION D. Grandfather clause

Any applicant or owner of a parcel of land within the jurisdiction of the City who has constructed the required stormwater management facility or who is in the process of meeting the stormwater management requirements of the law at the time of the effective date of this

Ordinance may elect to apply to the City Engineer for reconsideration under the provisions of this ordinance.

SECTION E. Conflict with other laws

Whenever the provisions of this ordinance impose more restrictive standards than are required in or under any other ordinance, the regulations herein contained shall prevail. Whenever the provisions of any other ordinance require more restrictive standards than are required herein, the requirements of such shall prevail.

SECTION F. Severability

If any term, requirement or provision of this Ordinance or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Ordinance or the application of such terms, requirements, and provisions to persons or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term, requirement, or provision of this Ordinance shall be valid and be enforced to the fullest extent permitted by law.

SECTION G. Amendments

This ordinance may be amended in the manner as prescribed by law for its original adoption.

SECTION H. Liability

Neither the approval of a plan under the provisions of this Ordinance nor the compliance with the provisions of this Ordinance shall relieve any person from the responsibility for damage to any person or property otherwise imposed by law nor shall it impose any liability upon the City for damage to any person or property.

SECTION I. Effective date

The Ordinance shall be effective immediately after adoption of this Ordinance by the City.