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SECTION 300 DRAINAGE POLICY

301 INTRODUCTION

The provisions for adequate drainage in urban areas is necessary to preserve and promote the general health, welfare, and economic well being of the region. Drainage is a regional feature that affects all governmental jurisdictions and all parcels of property. This characteristic of drainage makes it necessary to formulate a program that balances both public and private involvement. Over-all coordination and master planning must be provided by the governmental units most directly involved, but drainage planning must be integrated on a regional level.

When planning drainage facilities, certain underlying principles provide direction for the effort. These principles are made operational through a set of policy statements. The application of the policy is in turn facilitated by technical criteria and data. When considered in a comprehensive manner, on a regional level with public and private involvement, drainage facilities can be provided in an urban area in a manner that will avoid uneconomic water losses and disruption, will enhance the general health and welfare of the region, and will assure optimum economic and social relationships.

302 BASIC PRINCIPLES

302.1 Urban Sub-System

Drainage is a sub-system of all urbanization. The planning of drainage facilities must be included in the urbanization process. The first step is to include drainage planning with all regional and local development master plans.

Storm water management facilities, such as channels and storm sewers, serve both a conveyance and storage function. When a channel is planned as a conveyance feature, it requires an outlet as well as downstream storage space. When the space requirements are considered, the provision for adequate drainage becomes a competing use for space along with other land uses. If adequate provision is not made in a land use plan for the drainage requirements, storm water runoff will conflict with other land uses and will result in water damages, and will impair or even disrupt the functioning of other urban systems.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO CONSIDER STORM WATER DRAINAGE A SUB-SYSTEM OF THE OVERALL URBAN SYSTEM, AND TO REQUIRE STORM DRAINAGE PLANNING FOR ALL DEVELOPMENTS TO INCLUDE THE ALLOCATION OF SPACE FOR DRAINAGE FACILITIES

302.2 Multi-Purpose Resource

Storm water runoff is an urban resource. Whereas the runoff can be a liability to urbanization, storm runoff has potential for beneficial use. This use, however, must be compatable with adjacent land uses and Colorado Water Law.

When storm water runoff is treated as a resource, quality aspects of the water become important. This in turn relates to issues such as street cleaning practices, solid waste collection and removal services, and regulations on the development of raw land to control erosion and resulting silt loads. These practices influence succeeding water uses.

The storm water urban sub-system should be multi-purpose to satisfy the competing demands placed on water within the urban environment. Drainage facilities can fulfill other purposes aside from just drainage; and facilities not designed primarily for drainage frequently can be designed to provide drainage benefits.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO CONSIDER STORM RUNOFF AS A MULTI-PURPOSE RESOURCE WITH THE POTENTIAL FOR OTHER USES AND TO ENCOURAGE THE MULTI-PURPOSE USES.

302.3 Water Rights

When the drainage sub-system interferes with existing water rights, the value and use of the water are effected. The existing drainageways and storage locations frequently interrelate with the water rights, which must be addressed when planning the facility to preserve their integrity.

Ditches which have direct flow rights from a stream are controlled by headgates. Drainage improvements, which alter the quantity (or quality) of the water available to the headgate, affect the ability to divert water. Other ditches obtain all or portions of the rights by intercepting the shallow groundwater (seepage right). If the water right has not been abandoned or transferred to another location, the drainage design (including the sub-surface system) must be planned and constructed to preserve the water right. Similar situations can also occur when planning drainage facilities near reservoirs.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO RECOGNIZE THE EXISTING OR POTENTIAL FUTURE WATER RIGHTS AND TO INCLUDE THE INTERRELATIONSHIP IN THE PLANNING AND DESIGN OF THE PROPOSED DRAINAGE FACILITY.

302.4 Jurisdictional Boundaries

Since drainage considerations and problems are regional in nature, and do not respect jurisdictional boundaries, a successful plan must emphasize regional jurisdictional cooperation in accomplishing the goals.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO PURSUE A JURISDICTIONALLY UNIFIED DRAINAGE EFFORT TO ASSURE AN INTEGRATED PLAN.

303 REGIONAL AND LOCAL PLANNING

303.1 Basin Transfer

Colorado Drainage Law recognizes the inequitability of transferring the burden on managing storm drainage from one location or property to another. Ongoing liability questions also arise when the historic drainage continuum is altered. The diversion of storm runoff from one basin to another should be avoided unless specific and prudent reasons justify and dictate such a transfer. Prior to selecting a solution, alternatives should be reviewed. Planning and design of storm water drainage systems should not be based on the premise that problems can be transferred from one location to another.

The subdivision process can and will significantly alter the historic or natural drainage paths. When these alterations result in a subdivision outfall system that discharges back into the natural drainageway at or near the historic location, then the alterations (intra-basin transfer) are generally acceptable. However, when the subdivision outfall system does not return to the historic

drainageway, then inter-basin transfer may result. This inter-basin transfer must be prevented since it violates a basic civil drainage law principle (Section 402.1) by discharging water onto a subservient property in a manner or quantity to do more harm than formerly. If the development significantly increases the drainage area tributary to the subdivision outfall, then inter-basin transfer into the property has occurred, which also must be prevented.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO PROHIBIT INTER-BASIN TRANSFER OF STORM DRAINAGE RUNOFF AND TO MAINTAIN THE HISTORIC DRAINAGE PATH WITHIN THE BASIN.

303.2 Master Planning

As set forth in the policy statement 302.1, drainage planning is required for all new development plans. In recognition that drainage boundaries are non-jurisdictional (302.4), and that new development cannot plan for all the City, the City must take the lead role and cause drainage master plans to be prepared.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO PARTICIPATE IN THE DEVELOPMENT OF DETAILED REGIONAL DRAINAGE MASTER PLANS WHICH WILL SET FORTH SITE REQUIREMENTS FOR NEW DEVELOPMENT AND IDENTIFY THE REQUIRED PUBLIC IMPROVEMENTS. MASTER PLANS WILL BE PREPARED AND ADOPTED.

303.3 Public Improvements

When the drainage master plans (303.2) identify the public improvements are justified, mechanisms for funding the improvements are required. The funding should equitably distribute the initial costs and maintenance cost in proportion to the benefits received.

Included with the public improvements defined by drainage master plans is the Local Drainage System and the Major Drainageway System. The Local Drainage System consists of curb and gutter, inlets and storm sewers, culverts, bridges, swales, ditches, channels, detention areas, and other drainage facilities within the development required to convey the minor and major storm runoff to the Major Drainageways. The Major Drainageway System consists of channels, storm sewers, bridges, detention areas, and other facilities serving more than the subdivision of property in question.

THE POLICY OF THE CITY OF LONGMONT REQUIRES THAT ALL NEW DEVELOPMENT SHALL DESIGN AND CONSTRUCT THE REQUIRED DRAINAGE IMPROVEMENTS AS SET FORTH BELOW:

1. **The Local Drainage System as defined by the Final Drainage Report and Plan (Section 204 of MANUAL).**

2. **The Major Drainageway System within the development as defined by adopted master drainage plans (Section 303.2 of MANUAL).**

303.4 Floodplain Management

The City of Longmont has adopted floodplain regulations (City of Longmont Municipal Code Title 20 Floodplain Regulations) which set forth the purpose, restrictions, and requirements for floodplain development.

A copy of the regulation can be obtained through the City. Some of the main features of the regulation are as follows:

1. Base flood is defined as the 100-year flood.

2. The floodway is defined as that portion of the floodplain where development or encroachment into the floodplain will increase the base flood elevation by more than 1-foot.

3. The flood protection elevation is defined as being 1-feet above the base flood elevation.

4. Floodplains are zoned as overlay districts with the more restrictive requirements for each zone governing the development limitations.

5. The floodplain and floodway boundaries are controlled by the profile elevations.

Since the regulations have been adopted, they are considered policy for this MANUAL.

THE POLICY OF THE CITY OF LONGMONT REGARDING FLOODPLAIN MANAGEMENT SHALL BE AS SET FORTH INT HE ADOPTED FLOODPLAIN REGULATIONS.

303.5 Storm Runoff Detention

The value of storm runoff detention as part of the urban system has been explored by many individuals, agencies, and professional societies (References-1, -14, and -15). Detention is considered a viable method to reduce urban drainage costs. Temporarily detaining a few acre-feet of runoff can significantly reduce downstream flood hazards as well as pipe and channel requirements in urban areas. Storage also provides for sediment and debris collection which helps to keep streams and rivers cleaner. Thus, public health benefits may often accrue from storage of storm runoff.

Depending upon the area tributary to a detention site, two types of detention are defined: local and regional. Local detention is defined as the detention provided to serve only the developing area in question ("onsite" area) and not any of the area outside of the development boundaries ("offsite" area). Local detention is typically parking lot, roof top, or small (less than 1 acre-foot of storage) grassy areas, although the facility can be large for larger developments. Regional detention provides storage for both onsite and offsite areas. Regional detention generally is part of a park system or greenbelt area.

When properly designed and maintained, local detention can provide significant benefits for the initial storm drainage system (see Section 304.3). The benefits of local detention for the major system have been studied and preliminary data evaluations do indicate benefits (Reference-65).

Regional detention can provide significant benefits for both the minor and major storm drainage systems by controlling a greater volume of storm runoff. Also, the regional facilities require a more formalized maintenance program than local facilities and therefore the detention function is more likely to be preserved.

In some instances, the detention facility effect on flood peaks can be detrimental or have no significant benefit at all. Local or even regional detention adjacent to a major drainage is an example. Also, detention in the

lower reaches of a drainage basin may not be desirable. This detention can aggrevate the downstream drainage problems by holding back storm runoff and allowing the upper basin runoff to combine and increase the total basin flood peaks. The effects can be difficult to determine and are highly dependent on the design storm assumptions.

THE POLICY OF THE CITY OF LONGMONT IS TO REQUIRE ALL NEW SUBDIVISION TO PROVIDE DETENTION STORAGE FOR THE INITIAL AND MAJOR STORM AS SET FORTH IN THIS MANUAL. EXEMPTIONS FROM THE DETENTION REQUIREMENT MAY BE GRANTED FOR:

1. Subdivision of 1 acres or less with an impervious density less than 50%.
2. Fill areas.
3. Additions to buildings provided the total impervious area (existing and proposed) covers less than 10,000 square feet of impervious paved and roof surfaces.
4. A subdivision outfall basin with a basin area one (1%) percent or less of the basin area tributary to the nearest major drainageway as defined by the City Engineer.
5. Other situations as may be determined by the City Engineer to be in the best interest of the City.

ALL EXEMPTIONS ARE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER AND MAY REQUIRE ADDITIONAL ANALYSIS TO DEMONSTRATE THE BENEFITS OBTAINED BY GRANTING THE EXEMPTION.

303.6 Water Quality

Storm water runoff from urban and non-urban areas has been recognized as being of inferior quality. From urban areas, pollutants in the storm water runoff consist of street, household, and commercial litter, lawn and garden litter, chemicals and salts from winter ice control, pesticides, herbicides, fertilizers, and bacteriological pollutants. The rural type runoff is characterized by sand and silt erosion, fertilizers, and bacteriological pollutants. The industrial area type pollutants consist of silts, oils, salts, and other chemicals.

In recognition of the water quality problem of our nation's water, the water Pollution Control Act (PL 92-500) set forth the following goals:

It is the nation goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

It is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

It is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

It is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and

It is the national policy that a major research and demonstration effort by made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the continguous zone, and the oceans.

Subsequent to the passage of the Federal Water Pollution Control Act Amendments (PL-92-500), the Denver Regional Council of Governments (DRCOG) initiated a federally funded areawide water quality management study. The result of the study was the development of the "Clean Water Plan" which is the areawide management plan for the Denver Metropolitan Area. The "Clean Water Plan" represents the adopted local policy to meet the national goals set forth by PL-92-500.

IN RECOGNITION OF THE NATIONAL GOALS, THE POLICY OF CITY OF LONGMONT SHALL BE TO ENCOURAGE MEASURES THAT IMPROVE THE QUALITY OF STORM RUNOFF AND TO REQUIRE AN EROSION AND SEDIMENTATION PLAN BE PREPARED AND INSTITUTED FOR ALL NEW DEVELOPMENT IN ACCORDANCE WITH THE CRITERIA SET FORTH HEREIN.

303.7 Operations and Maintenance

An important part of all storm drainage facilities is the continued maintenance of the facilities to insure they will function as designed. Maintenance of detention facilities involves removal of debris and sediment. Such tasks are necessary to preclude the facility from becoming unhealthy and to retain the effectiveness of the detention basin. Sediment and debris must also be periodically removed from channels and storm sewers. Trashracks and street inlets must be regularly cleared of debris to maintain system capacity. Channel bank erosion, damage to drop structures, crushing of pipe inlets and outlets, and deterioration to the facilities must be repaired to avoid reduced conveyance capability, unsightliness, and ultimate failure.

THE CITY OF LONGMONT REQUIRES THAT MAINTENANCE ACCESS BE PROVIDED TO ALL STORM DRAINAGE FACILITIES TO ASSURE CONTINUOUS OPERATIONAL CAPACITY OF THE SYSTEM. THE PROPERTY OWNER OR SUBDIVIDER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL DRAINAGE FACILITIES INCLUDING INLETS, PIPES, CULVERTS, CHANNELS, DITCHES, AND DETENTION BASINS LOCATED ON THEIR LAND UNLESS MODIFIED BY THE SUBDIVIDERS AGREEMENT. SHOULD THE OWNER FAIL TO ADEQUATELY MAINTAIN SAID FACILITIES, THE CITY SHALL HAVE THE RIGHT TO ENTER SAID LAND FOR THE PURPOSE OF OPERATIONS AND MAINTENANCE. ALL SUCH MAINTENANCE COSTS SHALL BE REFUNDED TO THE CITY BY THE PROPERTY OWNER.

304 TECHNICAL CRITERIA

304.1 Data Acquisition and Evaluation

The first step in the implementation of a drainage program is to collect the facts. A program for collecting and analyzing storm runoff and flood data should be undertaken to provide the intelligent and orderly planning of storm drainage facilities in the future.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO MAINTAIN A COMPREHENSIVE PROGRAM TO COLLECT AND ANALYZE RAINFALL-RUNOFF RELATIONSHIPS IN THE CITY OF LONGMONT REGION. FROM THIS INFORMATION, HYDROLOGICAL DATA AND PROCEDURES WILL BE UPDATED FOR USE IN THE DRAINAGE PLANNING AND EVALUATION PROCESS.

Some drainage projects function more effectively or efficiently than others. Information should be collected and evaluated to determine which projects are successful and why so that future projects can benefit from the experience gained.

THE POLICY OF CITY OF LONGMONT SHALL BE TO COLLECT AND MAINTAIN A FACILITY EVALUATION DATA FILE FOR THE PURPOSE OF PLANNING AND DESIGNING FUTURE FACILITIES.

304.2 Technology

The design criteria presented herein represents the state-of-the-art for stormwater management. The criteria are intended to establish guidelines, standards, and methods for effective planning and design. The criteria should be revised and updated as necessary to reflect advances in the field of urban drainage engineering and urban water resources management.

THE POLICY OF CITY OF LONGMONT REQUIRES THAT ALL STORM DRAINAGE FACILITIES SHALL BE PLANNED AND DESIGNED IN ACCORDANCE WITH THE CRITERIA SET FORTH IN THIS MANUAL. THE CRITERIA WILL BE REVISED OR AMENDED AS NEW TECHNOLOGY IS DEVELOPED AND/OR EXPERIENCE GAINED IN THE USE OF THIS MANUAL.

304.3 Minor and Major Drainage System

Every urban area has two separate and distinct drainage systems, whether or not they are actually planned or designed. One is the Minor Drainage System and the other is the Major Drainage System.

The Minor Drainage System is designed to transport the runoff from flood frequencies of 2 years, depending on land use, with a minimum disruption to the urban environment. Minor storm drainage can be conveyed in the curb and gutter area of the street or roadside ditch (subject to street classification, and capacity as defined herein), by storm sewer, channel, or other conveyance facility.

The Major Drainageway System is designed to convey runoff from the 100-year recurrence interval flood to minimize health and life hazards, damage to structures, and interruption to traffic and services. Major storm flows can be carried in the urban street system (within acceptable depth criteria), channels, storm sewers and other facilities.

A typical drainage system within a subdivision would consist of flow in the storm sewer and allowable flow in the gutter, which combined would carry the flows from the "minor" storm without the effects of detention. These flows would be discharged to a larger sewer system or an open channel with capacity for the "major" flood. As the storm intensity increases (i.e., 10-year storm), the onsite detention would reduce the developed flood peaks to "undeveloped" levels thereby allowing the storm sewer/street system to extend its effectiveness to major floods. During calculation of the major storm runoff, the benefits of upstream onsite detention can be accounted for during the routing of flood peaks through the development (see also Sections 805 and 1202.2).

THE POLICY OF THE CITY OF LONGMONT REQUIRES THAT ALL SUBDIVISIONS INCLUDE THE PLANNING, DESIGN, AND IMPLEMENTATION FOR BOTH THE MINOR AND MAJOR DRAINAGEWAY SYSTEMS IN ACCORDANCE WITH THE FOLLOWING RECURRENCE INTERVALS:

LAND USE	RECURRENCE INTERVAL (YRS) MINOR DRAINAGE SYSTEM	RECURRENCE INTERVAL (YRS) MAJOR DRAINAGE SYSTEM
Residential - Urban	2	100
Residential - Rural	5	100
Commercial - Business	5	100
Industrial	5	100
Open Space	2	100
School	2	100

304.4 Storm Runoff

The storm runoff peak, volume, and timing provide the basis for all planning, design, and construction of drainage facilities. The best method for determining storm runoff is to measure the runoff from a flood with a known intensity and recurrence interval. Since this approach is seldom practical, various analytical methods have been developed which predict the storm runoff from preselected hydrological conditions (independent of chance). These methods are referred as deterministic models. Other methods evaluate measured past trends to predict future trends, which are referred to as probabilistic methods (dependent on chance such as a statistical analysis).

THE POLICY OF CITY OF LONMONT REQUIRES THE DETERMINATION OF STORM RUNOFF IN ACCORDANCE WITH THE FOLLOWING TABLE.

RUNOFF COMPUTATIONAL PROCEDURES

BASIN AREA	BASIN ZONE ZONE I	ZONE II	ZONE III	ZONE IV
A < 100 Acres	Rational Method	Rational Method	Rational Method	Rational Method
100 Acres < A < 160 Acres	Rational Method or	Rational Method or	Rational Method or	Rational Method or
160 < A < 10 Square Miles	CUHP	CUHP	CUHP	CUHP
A > 10 Square Miles	CUHP	Regional Analysis	Regional Analysis	Regional Analysis

NOTES:

1. **Basin area refers to the size of basin for which the peak flow and/or hydrograph is calculated.**
2. **Refer to Section 502 for description of the Zones, and determination of which Zone the basin lies within.**
3. **For Rational Method description, see Section 602.**
4. **For CUHP description, see Section 604.**
5. **For Regional Analysis description, see Section 607.2.**

304.5 Streets

Streets are an integral part of the urban drainage system and may be used for transporting storm runoff up to design limits. The engineer designer should

recognize that the primary purpose of streets is for traffic, and therefore the use of streets for storm runoff must be restricted.

THE POLICY OF THE CITY OF LONGMONT ALLOWS THE USE OF STREETS FOR DRAINAGE WITHIN THE FOLLOWING LIMITATIONS:

ALLOWABLE USE OF STREETS FOR MINOR DRAINAGE SYSTEM

DRAINAGE CLASSIFICATION [1]	MAXIMUM STREET ENCROACHMENT [2]
Type B	No curb overtopping. Flow may spread to crown of street.
Type C	No curb overtopping. Flow spread must leave at least one 10-foot land free of water, 5-feet either side of the street crown.
Type D	No curb overtopping. Flow spread must leave at least one 10-foot land free of water in each direction.

1. Refer to Section 904 for definition of drainage classification.
2. Where no curbing exists, the encroachment shall not extend past the street right of way.

ALLOWABLE USE OF STREETS FOR MAJOR DRAINAGE SYSTEM

DRAINAGE CLASSIFICATION	MAXIMUM FLOW DEPTH
Type B, C	The depth of water at the gutter flowline shall not exceed 12-inches. The Width of flow shall not exceed the ROW.
Type D	To allow for emergency vehicles, the depth of water shall not exceed 6-inches at the street crown and 12-inches at the gutter flowline. The width of flow shall not exceed the ROW.

ALLOWABLE CROSS STREET FLOW

DRAINAGE CLASSIFICATION	MINOR DRAINAGE SYSTEM MAXIMUM DEPTH	MAJOR DRAINAGE SYSTEM MAXIMUM DEPTH
Type B	6 inches depth in cross pan	12-inches in depth at gutter flowline
Type C	Where cross pans are allowed, depth of flow shall not exceed 6-inches at gutter flowline	12-inches of depth at gutter flowline
Type D	None	6-inches over crown

Cross street flow can occur in an urban drainage system under two conditions. One condition occurs when the runoff in a gutter spreads across the street crown to the opposite gutter. The second condition occurs when the flow in a drainageway exceeds capacity of a road culvert and subsequently overtops the crown of the street.

MINIMUM CULVERT/BRIDGE CAPACITY

DRAINAGE CLASSIFICATION	MINIMUM CAPACITY (RECURRENCE INTERVAL)
Type B	10-Yr
Type C	10-Yr
Type D	100-Yr

304.6 Floodproofing

Floodproofing can be defined as those measures which reduce the potential for flood damages to properties within a floodplain. The floodproofing measures can range from elevating structures to intentional flooding, or non-critical building spaces (i.e., basement) to minimize structural damages. Floodproofing measures are only a small part of good floodplain management which encourages the wise floodplain development to minimize the adverse effects of floods.

Floodproofing can be divided into measures required for protection of existing structures or future structures. For any future construction, the floodproofing requirements are controlled by the floodplain regulations (see Section 303.4) which generally restrict the types of structures within a floodplain.

The policy for existing structures is as follows:

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO ENCOURAGE THE FLOODPROOFING OF EXISTING STRUCTURES NOT IN CONFORMANCE TO THE ADOPTED FLOODPLAIN REGULATIONS BY UTILIZING THE CRITERIA PRESENTED IN THE "COLORADO FLOODPROOFING MANUAL" PREPARED BY THE DEPARTMENT OF NATURAL RESOURCES, COLORADO WATER CONSERVATION BOARD, DATED SEPTEMBER 1983.

305 IRRIGATION FACILITIES

305.1 Drainageway Interaction

There are many irrigation ditches and reservoirs in the Boulder County area. The ditches and reservoirs have historically intercepted the storm runoff from the rural and agricultural type basins, generally without major problems. With urbanization of the basins, however, the storm runoff has increased in rate, quantity and frequency, as well as changing in water quality. The irrigation facilities can no longer be utilized indiscriminately as drainage facilities, and, therefore policies have been established to achieve compatibility between urbanization and the irrigation facilities.

In evaluating the interaction of irrigation ditches with a major dranageway for the purpose of basin delineation, the ditch should not be utilized as a basin boundary due to the limiting flow capacity of the ditch. The ditches will generally be flowing full of near full during major storms and, therefore, the tributary basin runoff would flow across the ditch.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO REQUIRE DRAINAGE ANALYSIS TO ASSUME THAT AN IRRIGATION DITCH DOES NOT INTERCEPT THE STORM RUNOFF FROM THE UPPER BASIN AND THAT THE UPPER BASIN IS TRIBUTARY TO THE BASIN AREA DOWNSTREAM OF THE DITCH.

305.2 Storage Facilities

The problem of dam safety and the related hazard of the emergency spillways has been brought to the attention of the public by recent nationwide dam failures, and is the subject of a National Dam Safety Program by the Federal Government. Jurisdictional dams are classified by the State Engineer as either low, moderate, or high hazard structures depending on conditions downstream. Dams are classified as high hazard structures when, in the event of failure, there is a potential loss of life. Dams presently rated as low or moderate hazard structures may be changed to high hazard rating if development occurs within the potential path of flooding due to a dam breach. In this case, the reservoir owners would be liable for the cost of upgrading the structure to meet the higher hazard classification.

On June 1, 1983, Colorado State House Bill 1416 was signed into Law requiring the Office of the State Engineer to have prepared flood hazard maps resulting from the failure of the high hazard dams within the state. These reports will be made available to various cities, towns, and counties that may be affected by a dam breach.

THE POLICY OF THE CITY OF LONGMONT SHALL BE TO:

1. **Restrict development to areas outside of the reservoirs high water line created by the design flood for the emergency spillway.**

2. **Restrict development to areas outside of the high water line created by the breach of a dam (excepting high hazard classified dams which have passed inspection by the state engineer's office in accordance with 37-87-105 et seq 1973 CRS).**

3. **Restrict development to areas outside existing or potential future emergency spillway paths, beginning at the dam and proceeding to the point where the flood water returns to the natural drainage course.**

305.3 Irrigation Ditches

Irrigation ditches are designed with flat slopes and limited carrying capacity, which decreases in the downstream direction. As a general rule, irrigation ditches cannot be used as an outfall point for the storm drainage system because of these physical limitations. In addition, certain ditches are abandoned after urbanization and therefore could not be successfully utilized for storm drainage.

In certain instances, however, irrigation ditches have been successfully utilized as outfall points for the initial drainage system, but only after a thorough hydrological and hydraulic analysis. Since the owner's liability from ditch failure increases with the acceptance of storm runoff, the responsibility must be clearly defined before a combined system is approved.

The City of Longmont and the Oligarchy Ditch Company have tentatively reached an agreement which allows the discharge of storm runoff into the Oligarchy Ditch subject to certain constraints. The agreement will be used as a model for future agreements with other ditch companys.

THE POLICY OF THE CITY OF LONGMONT SHALL BE AS FOLLOWS:

1. **To require development to direct the storm runoff into historic and natural drainageways and avoid discharging into the canal or ditch except as required by water rights or where a reasonable alternative does not exist.**

2. **Whenever new development will alter patterns of the storm drainage into irrigation ditches by increasing flow rates, volumes, or changing points of concentration, the written consent from the ditch company shall be submitted with the development application. The discharge of runoff into the irrigation ditch shall be approved only if such discharge is consistent with an adopted master drainage plan and in the best interest of the City.**

3. **Whenever irrigation ditches cross major drainageways within the developing area, the developer shall be required to design and construct the appropriate structures to separate peak storm runoff from ditch flows subject to the condition noted in item No. 2 above.**

4. **When the storm runoff from a proposed development is tributary to the Oligarchy Ditch, the storm drainage design and construction shall be in accordance with the agreement between the City of Longmont and the Oligarchy Ditch Company.**