ENVIRONMENTAL QUALITY

SECTION 8

The natural environment of Douglas County presents a vast array of opportunities for, and constraints to development. A dynamic exists between development and the environment. The same natural beauty and character that makes the County an attractive place to live also present hazards that future development must avoid. Douglas County identifies environmental and geologic conditions to determine their potential impacts on land use and to protect life and property.

As growth and development occurs, environmental impacts can adversely affect the quality of life in Douglas County. Clean air, clean water, and peace and quiet are important factors in bringing residents and businesses to the County and are a natural resource highly valued by citizens. Protecting the environmental quality of Douglas County remains a high priority.

ENVIRONMENTAL CONSTRAINTS AND HAZARDS

Environmental constraints are conditions that affect or reduce the capability of the land to accommodate development. Constraints occur in varying degrees. Those constraints that pose a significant threat to life and property are identified as environmental hazards.

State law (C.R.S. §24-65.1-101) directs state agencies to identify environmental conditions affecting development and enables local governments to adopt regulations for affected areas.

Some of Douglas County's most distinct natural features, such as riparian zones, buttes, mesas, and the foothills, contain significant environmental hazards, including wildfire, flood, rockfall, and slope failure. At the same time, these areas offer spectacular scenic beauty, contain prime wildlife habitat, and constitute a major public asset.

Low-impact, nonurban land uses are encouraged in environmental hazard areas. Uses such as agriculture or grazing, open space, parks, or certain low-intensity recreational uses are compatible because of the lack of permanent structural improvements. Limiting development in hazard areas creates dual benefits: residents are spared the expense of hazard mitigation and maintenance, while the most scenic land in the County can be preserved for open space or as land use buffers.

Douglas County mapped environmental constraints and hazards with assistance from

the Colorado Geological Survey (geophysical), Colorado State Forest Service (wildfire), and Federal Emergency Management Agency (flood risk). The information within these maps is general in nature and is supplemented through site-specific studies performed during the development review process.

Additionally, wildfire hazard areas are identified within the adopted Wildfire Hazard Area-Overlay District Map. For lands designated as subject to wildfire by this map, a site-specific analysis of wildfire hazard is required at the time of land use review applications and building permit requests. Wildfire hazard is a contributing factor to the overall hazards associated with a site.

HAZARD CLASSIFICATIONS

CLASS 1 areas are of low to moderate constraints that require an awareness of the condition and may require engineering solutions to minimize impacts on development. Only a small portion of the County contains Class 1 constraints, including:

- Low erosion-susceptibility areas.
- Low to moderate shrink and swell soils.

CLASS 2 areas are of moderate to high threat to public safety. Special studies are necessary in these areas to determine the extent of the constraint and required mitigation. Class 2 constraints include:

- Unstable or potentially unstable slopes.
- Moderately accelerated erosion area.
- Moderate to high erosion susceptibility area.
- High and very high shrink and swell potential.

CLASS 3 areas are of very high to extreme threat to public safety where potential loss of property and life is significant enough to warrant avoidance of the natural conditions. Severe hazards may exist even after corrective engineering measures are taken. Nearly one-quarter of the County outside the Pike National Forest contains Class 3 constraints.

The Class 3 Hazards and Environmental Constraints Map (Map 8.1) illustrates the

extent of the Class 3 Hazard Areas. More detailed maps illustrating the locations of all environmental constraints are available at the Douglas County Department of Community Development.

GEOLOGY

The earth's surface is constantly undergoing natural changes and these will continue despite any attempts at intervention. Often these natural changes create problems where human interaction occurs. In some instances, geological conditions will constitute a significant threat to public health and safety or to property.

Development should not take place until a detailed evaluation of adverse geologic conditions within the area has been made. The evaluation must show that the adverse conditions will not result in significant threat or show that engineering and design can mitigate the conditions so that no serious threat remains.

HEAVING BEDROCK AND SHRINK-SWELL SOILS

Heaving bedrock is a distinctive geologic hazard generated by highly expansive soils that slide when wet and shrink when dry. This expansion and shrinkage creates potentially severe problems for building foundations. It poses greater risks to roads, utilities, and structures than typical expansive soils.

A significant area of mostly undeveloped land in Douglas County is characterized by potential heaving bedrock conditions. Heaving bedrock is delineated in Map 8.2, derived from Colorado Geological Survey

Special Publication 42. This map is based upon the coincidence of steeply dipping (tilted or upturned) layers of sedimentary expansive bedrock having dip angles of greater than 30 degrees from horizontal. Individual heave features may attain sizes as large as two feet high, tens of feet wide, and hundreds of feet long.

All shrink and swell soils can become a problem when structures are built upon them and owners irrigate landscaping, causing soils to swell, thus cracking foundations.

Soil erosion creates problems for the construction of roads, utilities, and structures. Gullies created by eroding soils can undercut unstable slopes and cause slope failures. The accompanying soil deposition alters streambeds and degrades water quality within streams and reservoirs. Measures to mitigate these potential problem situations must be addressed early in the development process.

Goal 8-1

Recognize and respect natural geologic conditions.

Objective 8-1A

Ensure development is appropriate when weighed against hazards and constraints.

POLICY 8-1A.1

Development on slopes shall be based upon the proposed level of intensity of site disturbance and types of resulting impacts. Substantial impacts, such as overlot grading, shall generally be limited to areas with slopes less than 20 percent in grade. Development on slopes that exceed 25 percent in grade shall demonstrate sensitive site design, result in minor visual impacts, protect significant existing resources, and provide appropriate mitigation of impacts.

POLICY 8-1A.2

Development within geologic hazard areas posing a threat of injury, loss of life, or property damage is inconsistent with this Plan.

POLICY 8-1A.3

Class 3 Hazard Areas should be limited to low-intensity land uses such as agriculture, grazing, open space, and certain recreational uses. These uses shall not conflict with identified hazards or increase the severity of on-site or adjacent off-site conditions.

POLICY 8-1A.4

Discourage development within areas of high potential for heaving bedrock, as identified on Map 8.2, unless adequate mitigation can be assured.

POLICY 8-1A.5

Locate development in areas with minimal geologic hazards, and mitigate impacts associated with development in Class 1 and Class 2 constraint areas.

POLICY 8-1A.6

Require detailed site investigations and mitigation measures by an engineering geologist or soils engineer for land use proposals located in Class 2 constraint areas. Mitigation measurers shall meet other goals of this Plan, such as preservation of views, grades, and landforms.

POLICY 8-1A.7

Engineering designs for mitigation of geologic hazards affecting such improvements as roads and utilities will be required during the subdivision review process.

POLICY 8-1A.8

Lands proposed for dedication, including all open space, park, school, and rights-of-way, should have an environmental audit showing the area is free of toxic or hazardous waste to prevent County liability for future cleanup.

FLOODING

Douglas County is located within a geographic area prone to receiving intense precipitation, resulting in major flooding of streams and drainageways, notably Plum Creek, Cherry Creek, and the South Platte River.

The relatively flat area adjacent to a stream that is subject to flooding is the floodplain. In these areas the destructive force of a possible flood constitutes a significant hazard to

property, public health, and safety. The 100-year floodplain defines areas that have a 1 percent chance of flooding for any given year. Uses in the 100-year floodplain are regulated through the Floodplain-Overlay District of the Douglas County Zoning Resolution. All 100-year floodplains are classified as Class 3 Environmental Constraints.

Goal 8-2

Limit land uses in floodplains.

Objective 8-2A

Preclude damage to life and property.

POLICY 8-2A.1

Ensure land uses allowed in floodplains are compatible with Douglas County floodplain regulations.

POLICY 8-2A.2

Discourage land uses within the 100-year floodplain unless associated with wildlife management, non-polluting recreational uses, agricultural uses, or as otherwise specified within the Zoning Resolution.

POLICY 8-2A.3

Locate shallow wells, solid waste disposal sites, septic systems, and sewage treatment plants away from floodplains.

POLICY 8-2A.4

Appropriate dredge and fill operations within the floodway shall be remediated to enhance and re-establish natural conditions.

POLICY 8-2A.5

Require the landowner to provide access to Douglas County and the Urban Drainage and Flood Control District into floodplains for floodplain and floodway maintenance, as necessary.

Objective 8-2B

Maintain floodplains as open space.

POLICY 8-2B.1

Protect and preserve riparian and wildlife management corridors to link habitat.

WILDFIRES

Douglas County's semi-arid climate, high incidence of lightning, steep slopes, strong winds, and mix of grasslands, shrublands, and forests, as well as the historical management of fire suppression, are factors which can contribute to the rapid spread of fires. A wildfire is defined as "an unplanned and unwanted fire requiring suppression action; an uncontrolled fire usually spreading through vegetative fuels but often threatening structures."

The most destructive wildfires occur in densely vegetated areas. However, wildfires can occur throughout a very significant portion of Douglas County dependent upon changing and variable factors. These factors include the presence of grasslands, drought, humidity, weather conditions, human activities, etc. Wildfire risk is evaluated for a specific location. The Douglas County wildfire mitigation specialists review all proposed development and construction in wildfire prone areas based upon the presence of these and other identified factors.

Goal 8-3

Reduce the risks of loss from wildfire hazard.

Objective 8-3A

Discourage and avoid development in areas with a high potential for wildfire, where mitigation is impractical or excessive, or where other significant constraints and hazards are present.

POLICY 8-3A.1

Residential development in severe wildfire areas, where mitigation methods are determined impractical or excessive, is generally inconsistent with this Plan.

POLICY 8-3A.2

Locate facilities with high concentrations of people (churches, schools, employment centers, residential development and recreation facilities, etc.) away from severe wildfire hazard areas where mitigation is impractical or excessive.

Objective 8-3B

Identify and mitigate wildfire hazards in areas determined appropriate for development.

POLICY 8-3B.1

Require two or more access points for emergency vehicles for residential development in wildfire areas when road lengths exceed adopted standards.

POLICY 8-3B.2

Link existing development to new development to provide multiple access points, where practical.

POLICY 8-3B.3

Ensure that wildfire mitigation practices and policies are implemented throughout the development review process.

AIR QUALITY

Douglas County is actively searching for ways to reduce air pollution and improve air quality. Having good air quality is essential for a healthy lifestyle and environment.

The County is part of the Environmental Protection Agency Air Quality Region 8 and participates on the Regional Air Quality Council (RAQC), a regional intergovernmental group committed to maintaining and improving the metro area's air quality through implementing federal and state air quality regulations.

The Denver Regional Council of Governments (DRCOG) performs air quality analyses for the region's transportation plans and is the regional mechanism for implementing air quality standards through development of the federally mandated State Implementation Plan. This plan reduces air pollution by regulating emissions of carbon monoxide, ozone, and total suspended particulates (very fine dust).

Douglas County works with the RAQC and DRCOG to address regional air quality issues and sets forth, in the policies below, a framework to implement regional goals.

Goal 8-4

Improve air quality.

Objective 8-4A

Cooperate with governments and businesses to improve air quality.

POLICY 8-4A.1

Use, at a minimum, standards established by the Colorado Department of Public Health and Environment and the Environmental Protection Agency to improve air quality.

POLICY 8-4A.2

Encourage clean, non-polluting industries to locate in Douglas County.

POLICY 8-4A.3

Encourage development patterns that reduce dependence on the automobile for work, shopping, and other trips, and provide for alternative modes of transportation.

POLICY 8-4A.4

Require businesses and developers to control dust and other pollutants resulting from construction, mining, travel on unpaved roads, and similar activities.

WATER QUALITY

Water is a basic human need and controlling water pollution is necessary to protect public health and welfare. Besides health needs, clean water has other positive benefits, including the support of aquatic life, wildlife habitats, vegetation, and aesthetics.

Pollutants can enter the water system as a point or a non-point source. Point sources of pollution enter the system at specific locations, usually generated by a specific source. Non-point sources are usually the result of storm water run-off. Pollutants are carried into the system after rain or snowstorms.

Because pollutants enter our waterways in many ways, a watershed-wide approach to water quality management and planning has been established for the three major watersheds located in Douglas County: Cherry Creek, Chatfield, and the South Platte. In each, associations have been formed with the County and incorporated towns as management agencies, and with individual water and sanitation districts as operating agencies.

EROSION CONTROL

Douglas County takes an active role in preventing non-point sources of pollution from soil erosion entering streams, lakes, and reservoirs. The Grading, Erosion and Sediment Control (GESC) and the Drainage, Erosion and Sediment Control (DESC) programs administered by the Public Works Engineering

Division provide for the review, permitting, and implementation of erosion and sediment control practices as they related to land disturbance activities. These programs are the mainstay of meeting the Phase II requirements of the National Pollution Discharge Elimination System of the Clean Water Act. These programs protect water resources by preventing excessive nutrients and sediments from entering streams and reservoirs.

GROUNDWATER

Although watershed plans and regulations deal primarily with the quality of surface waters, the goals and standards provide a certain degree of protection for groundwater as well. Because many County residents rely upon individual wells for water supply, the water quality of aquifers must be maintained. Under certain circumstances, groundwater quality can be affected by the inappropriate location of septic systems in the vicinity of wells and the infiltration of water from waste disposal sites. Contamination of groundwater from these and other sources should be prevented.

GOAL 8-5

MAINTAIN HIGH WATER QUALITY AND PROTECT WATER RESOURCES.

OBJECTIVE 8-5A

COORDINATE WITH REGIONAL AGENCIES TO PROTECT WATER QUALITY.

POLICY 8-5A.1
Encourage wastewater systems that recycle and reuse effluent.

POLICY 8-5A.2
Encourage wastewater systems that protect water quality.

OBJECTIVE 8-5B
ENSURE NEW DEVELOPMENT MAINTAINS AND IMPROVES WATER QUALITY IN ACCORDANCE WITH ALL ADOPTED CLEAN WATER REGULATIONS.

POLICY 8-5B.1
Require water quality monitoring and enhancement, where appropriate.

POLICY 8-5B.2
Use effective measures to protect groundwater and surface water from contamination in land use proposals.

POLICY 8-5B.3
Minimize both point and non-point source pollution.

POLICY 8-5B.4
Control drainage, surface erosion, and sedimentation sources through Best Management Practices (BMPs).

POLICY 8-5B.5
Cooperate with special districts in the County to protect alluvial wells.

OBJECTIVE 8-5C
ENSURE THAT WATER TREATMENT AND SEPTIC SYSTEMS WILL NOT HARM EITHER GROUND OR SURFACE WATER QUALITY.

POLICY 8-5C.1
Cooperate with special districts and municipalities in the county to protect alluvial ground waters by limiting intensive animal operations, by properly locating On-site Wastewater Treatment Systems (OWTS), and by properly designing storm water facilities.

POLICY 8-5C.2
Support community and district efforts to monitor and maintain OWTS.

POLICY 8-5C.3
Require safe and reliable options for the disposal of septage.

NOISE

State statutes have established limits of noise volume and duration. Exposure above these limits can result in hearing damage. Seven principal noise sources are:

- Airports or heliports
- Highways
- Off-road vehicle recreation areas
- Railroads
- Industrial areas
- Sports complexes
- Outdoor theaters

Because noise is a threat to public health, safety, and welfare, land use controls are considered a valid means of combating noise problems. Mitigation includes:

- Abatement of noise at the source
- Buffering
- Protecting noise-sensitive uses from uses generating excessive levels of undesirable noise
- Construction techniques
- Operations solutions

These measures are, in part, implemented through Douglas County regulations. Other noise sources including off-road recreational vehicles, industrial processes, or domestic animals, may necessitate other regulatory measures.

GOAL 8-6
MAINTAIN APPROPRIATE NOISE LEVELS.

OBJECTIVE 8-6A
EVALUATE AND MITIGATE NOISE IMPACTS, WHERE APPROPRIATE.

POLICY 8-6A.1
Require studies that evaluate and address noise levels and mitigation techniques for proposed land uses and activities.

POLICY 8-6A.2
Encourage the use of sound-dampening construction materials and design techniques to reduce outside and inside noise levels.

POLICY 8-6A.3
Discourage environmentally incompatible or visually objectionable noise mitigation measures as mitigation solutions.

SOLID WASTE MANAGEMENT

The Colorado Department of Public Health and Environment estimates that an average person produces approximately nine pounds of solid waste per day in Colorado. A large portion of solid waste generation can be attributed to disposable packaging and the consumption of manufactured goods.

The nature of solid wastes has changed in the last decade due to improved recycling processes, which have eliminated an average of 23 percent of the waste stream in Colorado. With more complex chemical compounds now available to the average consumer, domestic refuse has become considerably more toxic and complex to process.

The County contracts with a private firm to operate waste disposal transfer stations for the convenience of citizens in the county.

Recycling facilities are available for all County residents at the Sedalia landfill. Tri-County Health Department operates the Household Hazardous Waste Program.

GOAL 8-7

ESTABLISH SAFE, EFFICIENT SOLID WASTE DISPOSAL SITES COMPATIBLE WITH THE SURROUNDING ENVIRONMENT.

OBJECTIVE 8-7A

DEVELOP ALTERNATIVE MEANS OF WASTE DISPOSAL.

POLICY 8-7A.1
Cooperate with special districts, businesses, communities, and municipalities to promote a comprehensive approach to solid waste management that establishes a hierarchy for waste disposal: reduce, reuse, recycle, and dispose as a last resort.

POLICY 8-7A.2
Cooperate with districts, businesses, communities, and municipalities to develop alternatives that will reduce the amount of waste disposed in landfills, such as resource recovery and recycling.

OBJECTIVE 8-7B

ATTAIN HIGH STANDARDS IN DESIGN AND LOCATION OF WASTE DISPOSAL FACILITIES.

POLICY 8-7B.1
Discourage waste disposal systems from locating near environmentally-sensitive areas and significant wildlife habitat.

POLICY 8-7B.2
Design landfills to provide multiple levels of protection to assure long-term isolation of waste from the environment.

POLICY 8-7B.3
Encourage new, enclosed, trash-transfer sites to locate in areas with sufficient access, adequate screening, centralized water and sewer, and water quality drainage features, and away from sensitive environmental areas.

POLICY 8-7B.4
Require engineered improvements for landfill sites that do not exhibit optimum geological and meteorological conditions.

MINERAL EXTRACTION

Mineral extraction is the withdrawal of a commercial mineral deposit of limestone used for construction purposes, coal, sand, gravel, and quarry aggregate, for which extraction by an extractor is or will be commercially feasible, and regarding which it can be demonstrated by geologic, mineralogic, or other scientific data that such deposit has significant economic or strategic value to the area, state, or nation. For goals, objectives, and policies related to mineral extraction, refer to the Douglas County Mineral Extraction Plan, which is required pursuant to C.R.S. 34-1-301, et seq.