
Reforms for Aquifer Protection

Recommendations for City of San Antonio codes, ordinances, and policies



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Children playing in San Pedro Springs

Summary: The AGUA Reforms

Aquifer protection ordinance

- Reduce impervious cover limits, and apply them uniformly to the ETJ and corporate limits
- Increase buffer zones for floodplains and recharge features
- Apply protections to the contributing zone
- Eliminate weaknesses in grandfathering criteria
- Improve design and maintenance of water quality basins
- Require pesticide and fertilizer management plans

Hazardous materials/activities ordinance

Create a separate ordinance prohibiting hazardous material and activities in the recharge, transition, and contributing zones.

UDC zoning regulations

- Use the City's zoning powers to the maximum extent possible
- Create a new low-density residential zoning district and rezone undeveloped and newly annexed land for low-density uses
- Prohibit hazardous land uses in the contributing zone

UDC Storm water management regulations

Require utilization of Low Impact Development principles and Integrated Management Practices for storm water management

Public Education

Implement programs that educate citizens about the vulnerability of the Edwards Aquifer and the use of pesticides, herbicides, and fertilizers

UDC permitting

- Require submission of geological reports with Master Development Plans
- Tighten permit expiration rules to reduce grandfathering

SAWS & CPS policies

- Revise City-owned utilities' policies to provide new capacity only to developments complying with the Aquifer Protection Ordinance
- Require new development to pay 100% of costs of new capacity

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Note: AGUA's companion report, *Protecting the Edwards Aquifer*, provides the scientific basis for these recommendations and describes the geology of the aquifer, effects of development, and challenges inherent in aquifer protection.

Recommendations for Aquifer Protection

A. Aquifer Recharge Zone and Watershed Protection ordinance

Pollution prevention criteria

- 1) **Change Category 2 impervious cover limits to 10-15% for all land uses.**

Impervious cover limits are essential to preserve the natural quality, quantity, and timing of flow into streams and springs. We recommend an impervious cover limit of 10-15% of net site area in the recharge zone. Net site area should be defined as all land



H-E-B Brodie Lane grocery store; Austin, TX
15% impervious cover

with slopes less than 15% outside of stream or Critical Environmental Feature setbacks, golf courses, managed turf, and effluent-irrigated land. All building and transportation features except pedestrian walkways and bicycle trails shall be considered impervious.

- 2) **Create a new Category 4 for the contributing zone with impervious cover limits of 10-15%**

Apply the requirements to areas of the contributing zone within 10 miles of the recharge zone. Requirements for floodplain preservation, water quality basins, best management practices, and construction should be equivalent to the requirements in Categories 2 & 3.

- 3) **Eliminate Category 1 and the “substantial alteration” criteria for maintaining Category 1.**

The aquifer protection ordinance is the only one with provisions for “grandfathering” development projects. These provisions consistently operate to nullify the ordinance. Section 34-926 goes well beyond state law¹ in

¹ Texas Local Government Code Chapter 245, Issuance of Local Permits.

grandfathering altered projects, and has caused unnecessary grandfathering of numerous projects. The state statute does not require grandfathering of an altered project simply because it does not “increase the potential for degradation”. Furthermore, the City is not required to recognize vested rights on portions of a project when other portions have lost those rights. Determination of what constitutes a change in project is far too complex to encapsulate in a cookbook approach.

4) **Increase buffer zones for Significant Recharge and Critical Environmental features**



Pit cave in Northwest Bexar County

We recommend a 300-foot setback from any feature with the potential for transmitting flow directly to the aquifer. For features located on slopes, the setback should be offset so that it extends farther upslope from the feature than down slope.

Critical environmental features include karst openings or caves, faults, fractures, springs, bluffs, and wetlands. Feature identification and protection by setbacks reduces the risk of pollutants flowing into the

aquifer and preserves their natural pollution reduction, water purification, and water supply functions. Critical environmental feature regulations are limited in their effectiveness, however, because of our inability to identify all of the features prior to development, and by the expense or unfeasibility of redesign if the features are discovered during construction.

5) **Increase floodplain buffer zones**

We recommend these minimum setbacks from streams based on the size of the contributing drainage area:

5-100 acre drainage area – 100 foot setback

100 to 500 acre drainage area – 200-foot setback

Greater than 500 acres – 400-foot setback

Additionally, the setback shall never be less than the 100-year flood plain.

Natural soil and vegetation and low areas beside streams store floodwater, remove pollutants, provide baseflow, keep water cooler by shading, stabilize stream banks, and provide riparian habitat. When construction strips this vegetation to locate on stream banks, it is more damaging than development in upland areas. Runoff from these stream-side developments is usually channeled directly into the stream without treatment. Destroying natural riparian areas and removing trees and vegetation accelerates erosion, eliminates flood overflow areas, eliminates vegetative pollutant removal, and eliminates shading.

Additional control strategies

6) **Improve design and maintenance of water quality basins**

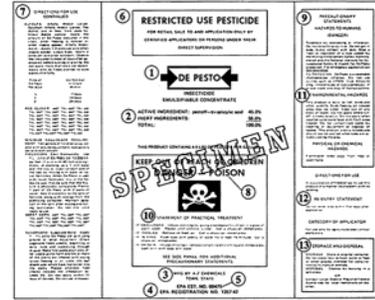
Design standards should be improved to increase reliability, efficiency, and maintainability of detention, sedimentation, and filtration basins. Basins should be designed for extended detention.

An estimated 80% of stream suspended sediment is derived from stream banks. Development contributes to this load not so much from the sediment washed from building roofs, roads, driveways and parking surfaces, but from the higher storm peak flows and/or larger runoff volumes that result in stream bank erosion.

- To prevent increased erosion, a one year, three hour rain event should be detained on a development site for at least 24 hours.
- Gaging features, that facilitate flow rate and sediment level measurements, should be required for all new basins.
- Water quality basins should be designed to remove 100% of the increase in average annual pollutant load for any pollutant based on a demonstration for at least these constituents: total suspended solids, chemical oxygen demand, nitrogen, phosphorous, and lead. A demonstration must be made for any other constituent determined to be limiting on the design.
- Comprehensive management plans for water quality basins should be required for plat approval. Operating permits, renewable annually, should also be required.
- Enforcement/penalty provisions should be implemented to ensure that the basins are properly maintained.

7) **Require landscape chemical management plans for new and existing commercial land uses. Prohibit chemicals that damage water quality or pose an undue threat to the aquifer.**

Many of the pesticides, herbicides, and fungicides applied to lawns, landscaped areas, and golf courses are toxic or carcinogenic in very small quantities. As much as 95% of the fertilizers applied to lawns move through soils, rainfall runoff, and ground water flow. Chemicals in these fertilizers create algae blooms in streams and disrupt or destroy habitat.



We recommend a prohibition on fertilizer application that might result in nitrogen migration to surface or groundwater; a prohibition on the application of herbicides and pesticides except those shown to represent no risk of migration or water contamination; and a prohibition on the use of non-native plants for landscaping in new developments.

Submittal of landscape chemical management plans should be required for plat approval on commercial development projects. Moreover, existing commercial uses should also be required to submit and implement such plans. Regulations can be modeled after the PGA Village Golf Course Environmental Management Plan.

B. Hazardous materials/activities ordinance



Hazardous materials on aquifer recharge zone
Wagner and Sons Paving

Hazardous activities and materials should be prohibited in the contributing, transition, and recharge zones. Although zoning regulations prohibit specific land uses, such as oil, lube, & tune-up shops, inside the City limits, these regulations do not apply in the extra-territorial jurisdiction (ETJ).

Therefore, a new ordinance should be adopted that prohibits the materials and activities

associated with these forbidden land uses. The language should be written such that it cannot be construed as a zoning ordinance. Since these regulations are not subject to the state grandfathering statutes, they should be

adopted as a separate ordinance to avoid the vested rights claims made against the aquifer protection ordinance. Existing businesses should be given a reasonable period of time to amortize their investment before relocating off of the aquifer.

C. Unified Development Code (UDC) zoning regulations

1) **Create a low-density residential zoning district (R87) with a density of 1 dwelling/2 acres.**

Because San Antonio's aquifer protection ordinance is largely nullified by the Texas Local Government Code Chapter 245, we must look to zoning to protect our aquifer. Zoning is the most powerful tool our City has available for aquifer protection.

Currently, there is no zoning district with lot sizes between 1 and 10 acres. Creation of a new R87 district would provide a legally enforceable means to limit development density in the recharge and contributing zones. Developers can utilize the Conservation Subdivision Use Pattern² to cluster dwellings on small lots, thereby avoiding the increased infrastructure costs associated with large lots.

2) **Rezone undeveloped land in the Edwards Recharge Zone District (ERZD) and contributing zone to R87.**

San Antonio's zoning powers significantly exceed its ordinance making powers. Any given tract of land is more likely to be grandfathered from the aquifer protection ordinance than it is to have a vested right to a particular zoning. The city should immediately commence rezoning of undeveloped land to R87. In addition, a moratorium should be immediately imposed to prevent landowners from defeating the rezoning initiative.

3) **Zone newly annexed land, in the contributing and recharge zones, for R87.**

Currently, land is zoned for high-density single-family residential use upon annexation. This density, while appropriate in other areas of the city, is incompatible with protection of the aquifer.

4) **Apply ERZD land use restrictions to the contributing and transition zones.**

The same land uses that are currently prohibited in the ERZD should also be prohibited in the contributing and transition zones.

² Unified Development Code, Section 35-203 Conservation Subdivision.

5) Prohibit Planned Unit Developments (PUDs) and density bonuses in the recharge and contributing zones.

PUDs are most commonly used for one purpose, to vastly increase the number of lots on a tract. PUD densities are typically 50% greater than those in the base zoning district. PUD subdivisions with 60% impervious cover, and tiny 1,400 square foot lots, are being constructed in the recharge zone. This level of impervious cover is inappropriate and damaging to water quality.

Density bonuses can be used to vastly increase allowable dwellings on a tract. This flawed section of the UDC provides bonuses that are far out of proportion to the benefits the City receives. Therefore, they should be prohibited in areas providing aquifer recharge.

6) Eliminate commercial and non-commercial parking lots as permitted uses in the recharge and contributing zones.

Parking lots are sources of numerous contaminants entering the aquifer. Regrettably, developers have been exploiting a loophole allowing commercial and non-commercial parking lots in the recharge zone. This loophole allows parking limits prescribed in the UDC's parking standards to be circumvented.

D. UDC Storm water management regulations

1) Require use of applicable Low Impact Development principles and Integrated Management Practices in the recharge and contributing zones.

Low Impact Development (LID) is a powerful technology that allows development to take place in a manner that can preserve ecological functions while maintaining development potential. This technology is promoted by the EPA as an environmentally-friendly alternative to conventional stormwater management practices. Currently, there are no provisions in the City of San Antonio development codes that allow utilization of this technology.



Austin's Central Park Wet Ponds

LID practices are distinctly different from regional detention facilities, because they manage stormwater in small, cost-effective landscape features located on each lot instead of conveying the water to large, costly detention facilities.

Stormwater controls are integrated throughout the site and are located near the source of impacts, virtually eliminating the need for centralized detention facilities. They avoid the environmental destruction created by large detention facilities, which are typically located in sensitive floodplains and require damaging channelization of upstream waterways. Austin's successful Central Park Wet Ponds have turned stormwater management facilities into community amenities. Cost benefits to builders and developers utilizing LID strategies can be significant.

2) **Limit stormwater runoff volume**

Post-development stormwater runoff volumes should be limited to a 10% increase relative to the volume discharged prior to development. This will limit stream bank erosion and the resultant sedimentation and adsorbed contamination that harms stream ecosystems. Note that current regulations limit peak runoff rates, not total volume.

E. Public Education

1) **Implement programs to educate consumers as to which pesticides, herbicides, and fertilizers have the potential to harm our aquifer.**

Most citizens are unaware that the chemicals they apply to their lots end up in our creeks, rivers, and drinking water. As a result, waterways such as Lorence Creek, in Stone Oak, are showing much higher levels of toxic pesticides in stormwater runoff³.



2) **Implement programs to educate citizens as to geography, vulnerability, water quality, and other issues regarding the Edwards Aquifer and its recharge, contributing, and transition zones.**

F. UDC plan submittal and expiration requirements

1) **Require submission of a geologist's report, identification of critical environmental features, and identification of existing wells for Master Development Plans (MDPs) and Planned Unit Development (PUD) plans.**

³ Quality of Stormwater Runoff from an Urbanizing Watershed and a Rangeland Watershed in the Edwards Aquifer Recharge Zone, Bexar and Uvalde Counties, Texas, 1996–98, U.S. Geological Survey, 1999.

Our aquifer protection efforts will succeed only if protection is designed into a project from the very start. Master Development Plans are the first plans submitted for a tract of land. A geological report is essential for identifying vulnerable areas that should be accommodated in the initial design. With this report, engineers will have the information they need to intelligently plan roads, areas of high development intensity, and areas of preservation.

2) Expire MDPs after one year unless at least 25% of the land area has been platted. Expire MDPs upon substantial alteration.

Although the state grandfathering statute restricts the City's ability to enforce the aquifer protection ordinance, it does provide for limiting vested rights through permit expiration. Our city should shorten the duration of MDPs to prevent "paper grandfathering", whereby developers submit plans for the sole purpose of circumventing a new regulation. Furthermore, the "minor amendment" criteria for expiration of MDPs⁴ should be modified to disallow changes in density, land area, and unit boundaries.

G. Infrastructure expansion policies

1) Revise San Antonio Water System (SAWS) and City Public Service (CPS) policies to provide capacity only to developments that comply with the Aquifer Protection Ordinance.

Because grandfathering so severely limits San Antonio's ability to protect the aquifer, it must look beyond ordinances for this protection. City Council should adopt policies that SAWS and CPS will provide capacity to new development only if it complies with our environmental ordinances.

2) Revise SAWS policies to require developers to pay for 100% of the cost of new capacity.

Currently, SAWS impact fees fall short of paying for the true costs of new water and sewer capacity. Instead, ratepayers are hit with large rate increases to subsidize new development. Especially for projects in the recharge and contributing zones, developers should pay for the entire cost of providing new capacity, including any hidden costs.

⁴ City of SA Unified Development Code, Section 35-412(g), May, 2001.

Acknowledgements

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