

## EXHIBIT “C”

### Water Quality Protection Measures

**1. Buffer Zones.** Buffer zones (undisturbed native vegetation buffer) should be established for the stream drainage system and sensitive environmental features within the Barton Springs zone. Buffer zones should remain free of construction, development, or other alterations. The number of roadway crossings of stream buffer zones should be minimized and constructed only when necessary to provide access to property that cannot otherwise be safely accessed. Other alterations that may take place within buffer zones include utilities, fences, and public and private parks and open space.

**A.** Each stream, with a definable stream channel having a bed and bank, should have an undisturbed native vegetation buffer on each side of the stream as follows:

**i.** streams draining greater than one square mile (640 acres) of area should have a minimum buffer of at least 300 feet from centerline of the waterway on each side of the stream;

**ii.** streams draining less than one square mile, but more than ½ square mile, should have a minimum buffer of at least 200 feet from centerline on each side of the stream;

**iii.** streams draining less than ½ square mile should have a minimum buffer of at least 100 feet from centerline on each side of the stream.

**B.** Natural drainage channels lacking a bed and a bank but having a contributing drainage area greater than 40 acres should have a minimum buffer of 50 feet from the centerline on each side of the channel.

**C.** Sensitive environmental features should have a minimum buffer of 150 feet (radius). If the drainage to a feature is greater than 150 feet in length, then the minimum buffer should be 300 feet (radius). Sensitive environmental features include caves, sinkholes, faults, fractures, springs, seeps, or any area that holds water or supports mesic vegetation for sustained periods.

**2. Low-impact development designs.** Development in the recharge zone should be limited to less than or equal to 15% impervious cover in the upland zone. Development in the contributing zone should be less than or equal to 20% impervious cover in the upland zone. The upland zone includes all land and waters not included in a buffer zone.

**3. Provisions for increased development intensity.** Development in the recharge zone may be increased to no more than 30% on-site impervious cover of the upland zone (developed site)

when sufficient off-site land is provided and maintained in an undeveloped condition in perpetuity such that the effective impervious cover (developed land plus off-site land) does not exceed 10% impervious cover. Development in the contributing zone may be increased to no more than 35% onsite impervious cover of the upland zone (developed site) when sufficient off-site land is provided and maintained in an undeveloped condition in perpetuity such that the effective impervious cover (developed land plus off-site land) does not exceed 15% impervious cover. This land should be provided in the same watershed (Barton, Little Barton, Bear, Little Bear, Slaughter, Onion, or Williamson) as the development and the same aquifer zone (recharge or contributing) as the development. The amount of additional acreage needed to avoid impacts may be less if more sensitive land is preserved; however, this would have to be assessed by the Service on a case-by-case basis.

**4. Construction-related erosion and sedimentation controls.** Development should incorporate an erosion control plan in accordance with the temporary best management practices of the Edwards Aquifer Rules (Texas Water Code, Chapter 213) and Technical Guidance Manual on Best Management Practices (June 1999, TNRCC, RG-348).

**5. Stormwater quality treatment.** Development with 10% or more on-site impervious cover in the uplands zone should provide permanent best management practices to meet the performance standards of the Edwards Aquifer Rules and Technical Guidance Manual. These rules require implementation of best management practices to remove 80% of the increase in total suspended solids load resulting from development. In addition, the vegetative swales non-structural best management practice should be applied below structural controls to further reduce dissolved materials, where structurally practical.

Development with 10% or more on-site impervious cover should also provide streambank erosion control by capturing and detaining the 1-year, 3-hour storm event (See Technical Guidance Manual on Best Management Practices, June 1999, TNRCC, RG-348) and releasing it over a 24-hour or greater period.

Developments with less than 10% impervious cover should use the vegetative swales and filter design measures in the Edwards Aquifer Technical Guidance Manual to convey stormwater off of the site and meet the performance standards of the Edwards Rules.

**6. Maintenance plans.** Plans for maintenance of structural water quality and erosion controls should be prepared and implemented in accordance with the Edwards Aquifer Rules. In addition, all developments should employ the non-structural best management practices to the maximum extent practical.

**7. Environmental education.** Educational efforts should be implemented to inform the public about the sensitivity of the aquifer and their potential impacts to the water quality. The developer or owner of the project should include within the development plans an environmental educational program for residential, industrial, and/or commercial developments in the Barton Springs zone. Topics could include the Barton Springs salamander, karst geology, best

management practices, buffer zone maintenance, fertilizer application, pesticide use, organic gardening, and disposal of hazardous household chemicals. Materials used should be obtained from the Service, TNRCC, American Water Works Association, National Ground Water Association, Water Environment Federation, or other sources, as approved by the Service. Development of kiosks, displays, video, and/or other media to present material covering a variety of non-point source pollution control topics should be encouraged. Alternative educational efforts, such as site-specific recharge feature displays and educational nature trails should also be encouraged. Similarly, all developments should encourage integrated pest management plans to minimize exposure of stormwater runoff to chemicals (fertilizers, herbicides, pesticides, etc.).