Cahaba River Society

CHECKLIST OF WATERSHED PROTECTION MEASURES IN DEVELOPMENT PROJECTS

"RIVER-WISE" SITE DESIGN

- ❑ Design site to cluster development in areas with least watershed impact and to preserve sensitive areas - natural forested open space, steep topography, natural drainage channels, significant habitat and ecosystems. Locate dense uses to minimize mass grading in steep topography. Consult Upper Cahaba Greenprint Plan for GIS mapping of these resources. (Note this map does not include stream buffer zones or floodplains, which should be mapped as well.)

- ❑ Master plan the storm drainage system for entire subwatersheds - just as a road system is master planned – to ensure that upstream development does not overwhelm pre-existing downstream drainage systems in the future and to keep natural drainage systems intact to the extent feasible. Preserving the river corridor and tributaries in a natural state protects water quality, reduces flooding, provides greenway opportunities for trails and recreation. Lakes on small tributaries can capture impacts of development.

EROSION CONTROL

- ❑ Include fully designed sediment and erosion control measures in all bid packages for contractors. Otherwise, contractors may underbid this important item.

- ❑ BMP's must be **in place** prior to clearing and grading.

- ❑ Devote sufficient site area to adequate retention/detention. Silt fences/hay bales alone are insufficient and have been shown to capture only 50% of sediment <u>even when properly installed and maintained</u>. Sediment ponds will often be necessary, and will need forebays (smaller first stage ponds) for ease of frequent sediment cleanout.

- ❑ Minimize stream crossings. All temporary stream crossings must be designed to prevent erosion and minimize stream corridor degradation.

- ❑ Phase clearing and grading – minimize area cleared/graded at one time, stabilize soil with mulch/vegetation before moving on to new area. Do not grade large areas that remain as bare soil for extended periods.

- ❑ For large graded areas draining to one location, use portable treatment systems, infiltration. Portable systems remove sediment by centrifuge, can be moved with phasing of construction.

- ❑ Erosion/sedimentation control inspector should be independent of contractor – frequent preventative inspections must occur. Inspect to ensure BMP's are in place and adequate (1) before clearing and grading, (2) during project, (3) soon after all significant rains.

POST-DEVELOPMENT WATER QUALITY AND QUANTITY

- ❑ Post-development controls are essential to **reduce both volume and rate of site runoff AND reduce storm water pollutants** throughout life of project – nutrients, lawn chemicals, heavy metals, pathogens, auto-related (tire dust, petroleum products), etc. Adequate post-development controls may influence site design, density and layout.

- ❑ Design all permanent alterations to natural drainage system so that rate of exit flow to natural downstream channels is at pre-development levels and any increase in volume of flow is minimized to the greatest extent feasible. This prevents flooding and erosion/scour of downstream channels, which is a significant sediment pollution source.
- ❑ Use on-site infiltration systems to trap/filter pollutants such as lawn chemicals, heavy metals, petroleum products and to reduce runoff volume – grassed swales, rain gardens (biofiltration), level spreaders.
- ❑ Minimize paving to reduce potential runoff volumes – minimize size of parking lots, reduce road widths, landscape within cul-de-sacs. Sheet flow paving runoff for infiltration v. sending to hardscape storm drainage where feasible.
- ❑ Use porous paving on overflow/peak parking areas, sidewalks, etc.
- ❑ Direct roof, street and parking drains first to cisterns or other storage for landscape watering, then to swales and rain gardens vs. to pavement and storm drains.
- ❑ Use permanent lakes and created wetlands to slow runoff, capture pollutants, allow infiltration and filtration.

BUFFER ZONE & FLOODPLAIN PROTECTION

- ❑ Leave floodplains intact - either no fill in floodplain OR compensate for any loss of volume with additional on-site flood storage (no net loss of flood storage volume).
- ❑ Leave buffer zone setback along banks of river AND major tributaries – maintain natural tributaries for flood management, filtering of pollutants, greenways and recreation. Buffer zone setback should include steep streamside topography, floodplain, wetlands, and minimum setback based on size of stream. See proposed Buffer Zone Ordinance.

SEWER SYSTEM & UTILITIES

- ❑ Use septic systems only where topography / soils are adequate and lot sizes sufficient to provide alternate drain field site. Do not locate in floodplains. Long-term provisions to ensure regular maintenance and pump-out are essential.
- ❑ Design and locate sewer lines to prevent degradation of stream corridors from open cut construction – locate utility lines requiring open cut outside of all natural stream corridors, have minimal stream crossing, aim for perpendicular crossings.
- ❑ Utilize reuse of treated wastewater for forest/landscape irrigation.

REFERENCES:

- Center for Watershed Protection – 22 Principles of Site Design, info concerning design of post-development controls – see www.cwp.org and www.stormwatercenter.net
- Conservation Design Forum, Inc. – private multidisciplinary firm specializing in innovative storm water control – see www.cdfinc.com - especially Blackberry Creek study
- Building Outside the Box program of Cumberland River Compact – low impact development demonstration projects for watershed protection, at varying urban, suburban, rural scales – see www.cumberlandrivercompact.org/programs_bob.shtml