

DRAFT OUTLINE (April 14, 2004)

**Atlanta Country Club
Best Management Practices for Water**

Site Assessment

Area, Plants, General factors

Greens - 145,000 square feet, A1 Bent grass (low drought tolerance), Soil - USGA specifications, Technology - sub air and fans, double quick couplers, 10 to 12 cupping areas (no more than 1.5% slope), Some traffic funnels, intense water control by hand watering and scouting, low cutting height (.115 - .130 inch)

Tees - 180,000 square feet, Hybrid Bermuda grass (high drought tolerance), Soil - 144,000 square feet is USGA mix with drainage and 36,000 square feet is native clay/loam mix, Good traffic control, quick coupler at each tee, 80 % heavily shaded (less water), Par 3 tees are over seeded to handle traffic in winter (more water), good water holding capacity and less water use, low cutting height (.5 inch).

Fairways - 40 acres, Hybrid Bermuda grass (high drought tolerance), Soil - native clay mixes, Poor drainage, Shaded on half of course, High traffic on course, good water holding capacity, quick couplers every 90 yards, low cutting height (.5 inch)

Rough - 20 acres, Hybrid Bermuda grass (high drought tolerance) and Tall Fescue grasses in shaded areas (low drought tolerance), Soil - native clay mixes, Mature trees, high traffic, High cutting height (2 inches)

Landscape - 10 acres, various plant material (various drought tolerance and maturity), mostly mature plants and use less water, Soil - native clay mixes

Club Grounds - 6 acres (include grass, nursery stock and annuals), Intense maintenance, Soils - native clay mixes except in annual beds (amended with topsoil), Lots of hand watering, Grass is hybrid Bermuda grass (High drought tolerance), Cutting height 1 inch,

Irrigation Audit Summary

Pump Station - 1995 Synchroflo Variable Frequency Drive 1500 gpm, Low Pressure shut down, High Flow shut down, direct line monitoring to Maintenance Facility, Flooded suction centrifugal pumps, Wye strainer with auto wash, Flow meters, hour meters, 2002 complete overhaul, Weekly visual, Maintenance as per manual, Good condition

Controls - Toro Osmac Radio control, Osmac for windows software, dedicated computer, 12 satellite controllers with grounding, 4 keypad Motorola radios, good condition

Block system - Inside/outside loops at greens, 2 quick couplers at each green, low gpm Hunter heads at greens, Rainbird Valves, Rainbird 700s and 750s tees, fairways and rough, Toro pop up heads and Rainbird drip systems in landscape and slopes. Installed in 1997 with upgrades in 2001.

Efficiency - 90% (estimate)

Overall water needs

Record Keeping - Weekly log of flow at pump station - Yearly Range 26 million to 30 million gallons (Attach one year of records plus total usage)

Water Testing - As needed, approximately every other year for water quality (attach most recent tests)

Source - 2.5 acre surface impoundment with supplemental well water. Small water shed so the well water is our primary source.

Future needs - No new areas requiring water are planned. If the well water continues at current rates, no new water is needed.

Alternative water sources - Currently we are utilizing the best possible source. Surface withdrawal of Sope Creek, Rock Creek or other ponds is impractical at this time. Should a Reuse source become available, Atlanta Country Club would seriously consider utilization while keeping the well water backup

Best Management Practices and Current Conservation Measures

Current Irrigation Controls and Costs - Pump Station (\$75,000) with Low pressure and High flow shut down, VFD technology to keep loss down from High pressure relief and leaks Toro Osamc Software and radio control (\$60,000) for efficient night watering and daily watering of hot spots Direct line monitoring of Pump Station to detect leaks and water loss (\$2,500)

Staffing - Fulltime Irrigation assistant to handle repairs, records, inventory, scheduling, etc. (\$35,000) Part time help on repairs (\$6,000) Supervisor time (\$10,000)

Scouting - Daily scouting for wet spots, dry spots through out the property (\$35,000) this includes drainage issues as well as dry issues

Hand Watering - Hand watering of new installations, Annuals, Sod, dry spots on greens, dry spots on fairways (\$12,000)

Night Water - Water course at night to reduce loss and to keep from extending the natural free moisture range (disease pressure reduced)

Rain, leak, etc. loss controls - See Scouting, Pump Controls, Irrigation controls

Traffic Controls - Move and reduce traffic by utilizing signs, ropes, hole closed to traffic, and change directions mowing. These efforts reduce compaction and stress increasing drought tolerance and efficient water use (\$6,000)

Management of Turf grass for water conservation

- A. Keep standard heights of (do not go lower than needed) to reduce stress.
- B. Soil Cultivation - Aerate and top dress to promote good root depth enhancing water efficiency of the plant - Greens 3 plus times per year, tees 3 times per year, fairways 1 time per year
- C. Evapotranspiration - Utilize weather station (Atlanta Athletic Club) weather data to help schedule irrigation cycles based on evapotranspiration values
- D. Landscape Material Selection - Install only strong plant material adapted to the climate for water use efficiency. Use mulch to hold moisture.
- E. Natural Areas - Remove areas from maintenance (3 hill right, 13 in front of tees, 12 right of tees, 11 road sides)
- F. Fertilization - Do not overfeed turf to keep from using too much water - Low Nitrogen (3 pounds Bermuda grass / 4 pounds on bent grass)
- G. Pest Management - Scout for indicators, use precise applications, apply early morning or in the evening (when irrigating in) to reduce water loss
- H. Wetting agents - Utilize wetting agents to enhance water applications to hydrophobic areas reducing water runoff and loss

Reasons for water conservation

Proper water management dictates that OVERWATERING is unacceptable
Playability dictates that dry is better therefore over watering is bad for the game

Over watering will break down the environment and micro environments that are essential for the success of the turf and landscape plant
Economics - watering and water management costs money
Economics - players reject wet golf courses
Depleted water supplies and reduced water quality

Record Keeping

- Man hours involved with scouting
- Man hours involved with hand watering
- Man hours involved with irrigation repairs
- Costs of parts for repairs (\$13,000)
- Weekly, Monthly and Yearly water usage
- Water quality tests
- Pesticide and fertilizer applications (in relation to irrigation)

Irrigation Method

Combination of plant based, soil based, atmosphere based and budget approach.

Drought Conservation Plan

Goal of 10% cut (level one)

- Cut Road sides and Driving Range - total ()
- Reduce Rough by 10% - Total ()

Goal of 20% (additional 10%)

- Cut Fairways by 10%
- Cut tees by 10%
- Cut Rough by an additional 5%

Counter measures to reduce the effects of drought

- Raise mowing heights where possible
- Stop mowing in areas that are cut off
- Increase hand watering
- Reduce traffic (no carts on turf)
- Reduce fertility
- Keep mowers sharp
- Education of patrons

Education Program

Benefits of Golf course and Turf

- Economic contributor
- Carbon dioxide exchange for oxygen
- Temperature moderation
- Erosion control
- Water filter for improved water quality

Wildlife sanctuary
Recreational benefits of reduced stress and increased health
Community outreach (First Tee Programs)
Publish this Best Management Plan for use at club
Articles in the Company Newsletter proper water use and water conservation
During drought have papers on water conservation in the pro shop and locker rooms for members and patrons to use at home
Post a poster that shows this golf course uses best management practices for water conservation

Future upgrades for water conservation

New irrigation controls and computer with rain shut off (\$100,000)
Float shut off sensors for wells (\$12,000)
Meters for wells (\$8,000)
Record keeping for wells (\$6,000 per year)
Irrigation upgrade to individual head control (\$800,000)

Attachments

Pump Station Records
Most Recent Water Quality Test Results
Man Hour Records
Budget
Repair Records
Copies of Publications