Water Management Plan For
The Blue Ocean Golf Club

A water management plan reviews current water management practices and identifies opportunities for improvement in water use efficiency/conservation for the whole golf club facility. Currently we use only use the water we collect from rainfall throughout the year in our lakes and reservoir. From September thru April we have sufficient accumulations of rain to keep our reservoirs and lakes full. The most important months of rain are from May to August. Much like the SCRD we have internally developed water restriction stages for the golf course. We base this off a number of environmental factors as well as our volumes of water in our reservoirs and lakes. The golf course strives to use water responsibly, economically, and efficiently so we have a number of conservation strategies we look at before making any decisions that would require the use of water. The following ten conservation strategies are followed to the best of our abilities when operating all areas the golf course.

1. Use of Non-Potable Water
2. Efficient irrigation design and monitoring devices
3. Efficient irrigation system scheduling/operation
4. Development and selection of planting
5. Landscape design
6. Cultural practices to enhance water use efficiency
7. Indoor water conservation
8. Education
9. Development of conservation and contingency plans
10. Monitor and revise

The following plan is intended to guide the management practices that will allow flexibility and continued financial viability of the club, while still drawing balance between water use and supply during the period of May 1st to September 30th each year

2. Blue Ocean Golf Club Information

- Total Area of Property 150 acres
- Total Area Irrigated 35 acres
- What areas are under irrigation

Greens	140,000ft2
Tees's	110,000ft2
Fairways	1,200,000ft2
Rough	0
Other Areas	1000ft2

Note: Area Calculations are based on Physical measurement from scale photos (google maps) using the Planimeter Application.

- Water Sources
  - Total amount of water Available
    - Approximately 11.5 million gallons
  - Main reservoirs
    - #13
      - Source for irrigation pumping station distribution
      - Approximately 2.2 million gallons
    - #12
      - Approximately 4.5 million gallons
      - Fills via rain fall (no runoff) and mechanically pumping from the #13 pond
      - Siphon to #13 pond
    - #4/5
      - Approximately 1.8 million gallons
      - Fills via runoff and rainfall
      - Mechanically pump water to the #13 pond
    - Other available water
      - Several ponds on the golf course
      - Approximately 1 million gallons in total
      - All have to be pumped thru the chain of ponds down to the pond on 4/5. From there it is mechanically pumped to #13
- Type of System

We have a Rainbird Stratus II central controlled computer system. The irrigation heads are electric valve in head primarily two heads per station. We have two pumps (50hp- 10 hp) with the ability to produce up to 550gpm. The irrigation lines are statically maintained at 90psi via pressure tank. We have high flow and low-pressure alarms on the pump station to shut down incase of any major leaks.

- Soil Types in each area

Greens	Sand
Tees	Sand

Fairways	Mix of Sand and Soil
Roughs	Mix of sand and soil
Others	Varied

- Turf types under irrigation
  - Greens Poa annua/Bentgrass
  - Tees Poa annua/Perennial Rye
  - Fairways Poa annua/Perennial Rye
  - Rough Poa annua/Perennial Rye/Fescue
  - Others Poa annua/Perennial Rye/Fescue/bedding Plants

- Plant Requirements
  - Approximately 1.25 inches of irrigation per week
    - 43.75 acre inches of water/ week (1,188,000 gallons)
    - Based on 18 weeks of full irrigation per season (may-Sept)
    - Approximately 21,000,000 gallons Required
    - Not calculated is evaporation and ground loss

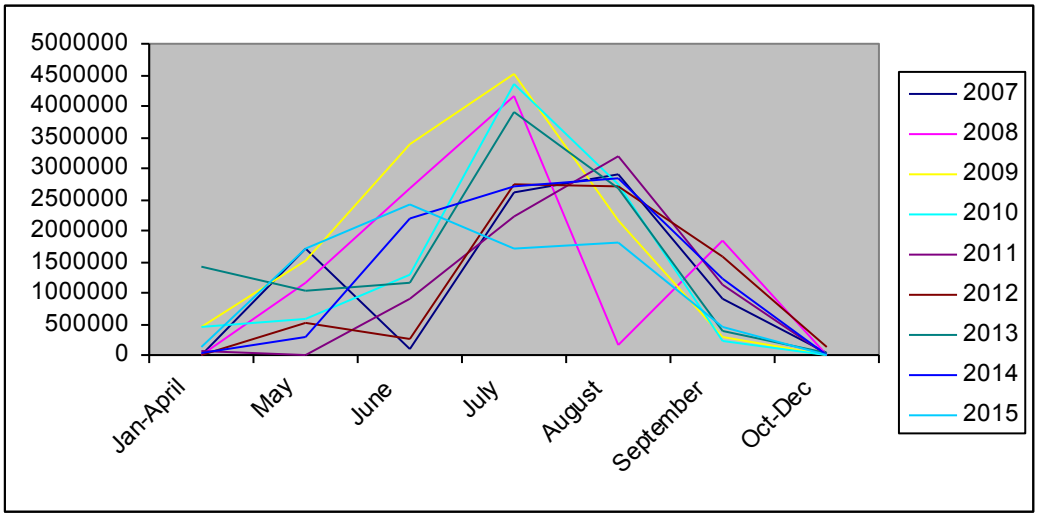
1. Water Use Management Information

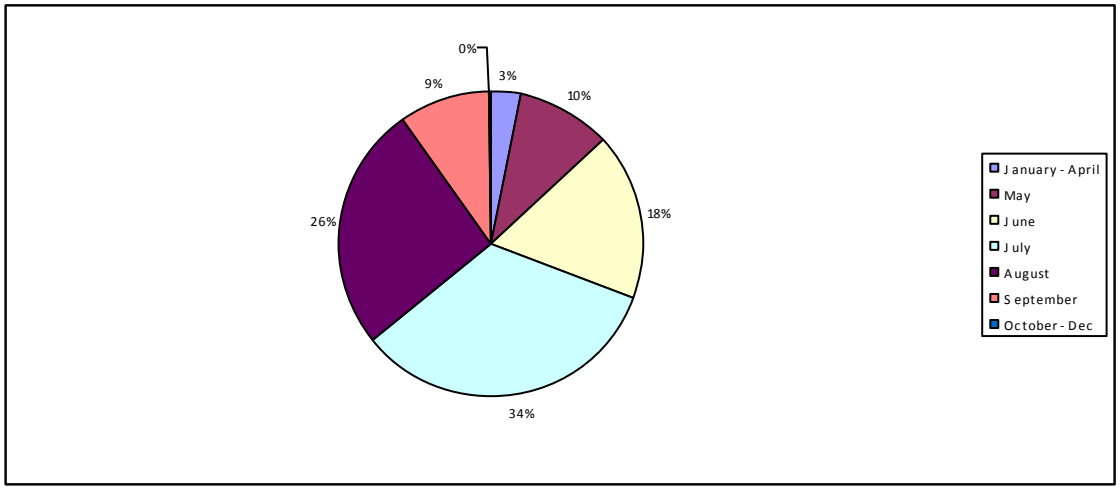
- Metering Method

  Pump station/ Central Controller/Historical Data

- Total Volume (Gallons) used:

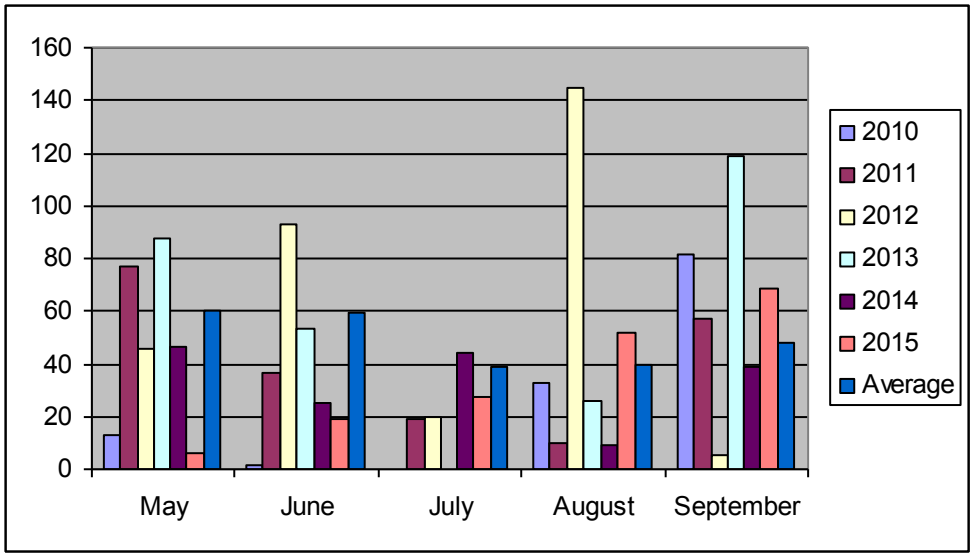
Year	Jan-April	May	June	July	August	September	Oct-Dec	Total
2007	7000	1718000	107800	2601000	2889000	916000	25000	8263800
2008	11600	1177000	2669000	4172000	172100	1847000	0	10048700
2009	447000	1527000	3387000	4505000	2176000	284000	0	12326000
2010	438000	584000	1287000	4349000	2737000	226000	0	9621000
2011	80000	14000	913000	2231000	3195000	1141000	11000	7585000
2012	0	531000	252000	2748000	2701000	1584000	139000	7955000
2013	1407000	1019000	1177000	3916000	2671000	391000	48000	10629000
2014	25000	299000	2196000	2701000	2823000	1236000	0	9280000
2015	113000	1714000	2427000	1710000	1822000	448000	3000	8237000





- Historical Rainfall

	Jan-April	May	June	July	August	September	Oct-Dec	Total
2010	96.5	12.8	1.9	0	32.4	81.8	327.9	553.3
2011	376.2	77.3	36.4	19.3	9.8	56.8	236.6	812.4
2012	395.4	45.5	92.6	19.9	144.5	5.2	429.3	1132.4
2013	291.1	87.4	53.4	0	25.6	119.1	141.4	718
2014	372.7	46.7	25.3	44.2	9	39	446	982.9
2015	373.8	5.8	18.7	27.3	51.7	68.4	419.9	965.6
Average	483.5	60.4	59.1	38.9	39.5	48.2	488	1217.6



2. Measures to Conserve and Reduce Water Use

Cultural- aeration, wetting agents, fertility
Moisture Meters- instant soil water content
Daily Visual – IPM management
System maintenance- fully trained team member is on site at all times or on call to repair any damage or leakage
Application methodology- scheduled with a computerized irrigation system. Application rates and time can be adjusted by to 1%-100% of run times on a daily basis.
Staff training – on site training of all staff
Public education and notification – notification is made at the entrance of the golf course stating:
"In our on going efforts to be environmentally responsible, Blue Ocean Golf Club operates under a Water Use Plan established and approved by Blue Ocean Golf Club. We are proud to say that we do not irrigate our golf course with potable water, and all irrigation water is captured during wet periods and stored for later use"

Water Shortages Levels

Stage 1
When all Ponds and Reservoirs are at capacity and there is potential rain with the run off to continue to top off.

Stage 2
No water running into our ponds and reservoirs but still at capacity. Any water use is depleting our water reserve. Potential for rain that will runoff.

Stage 3
No water running into our ponds and reservoirs are at >50%. All water use is depleting our water reserve. No potential for rain that will runoff <30 days.

Stage 4
No water running into our ponds and reservoirs are at <50%. All water use is depleting our water reserve. No potential for rain that will runoff >30 days.

Goals and irrigation scheduling During Water Shortage Stages (May 1 - September 30)

Stage 1
Full Irrigation applications based on Plant requirement on all irrigated surfaces. Hand water to maintain these levels. Areas between tee boxes and fairways (Flats) are restricted up to 100%. Up to 300,000 gallons Daily Usage

Stage 2
Full Irrigation applications based on Plant requirement on Tees, Greens, and Fairways. Hand water to maintain these levels. Areas of fairways working from tee to green (up to 200yard markers) are restricted up to 100%. Flats no longer receive any water. Up to 225,000 gallons Daily Usage

Stage 3
Full Irrigation applications based on Plant requirement on Tees, Greens, and Fairways. Hand water to maintain these levels. Areas of fairways working from tee to green (up to 100 yard Marker) are restricted up to 100%. Up to 175,000 gallons Daily Usage

Stage 4
Full Irrigation applications based on Plant requirement on Tees and Greens. Hand water to maintain these levels. All areas of fairways are restricted up to 100%. Up to 100,000 gallons Daily Usage