

Water Quality Study  
Of the  
1587 Roswell Street Lots

In  
Land Lot 592, 17<sup>th</sup> District, 2<sup>nd</sup> Section,  
City of Smyrna, Cobb County, Georgia

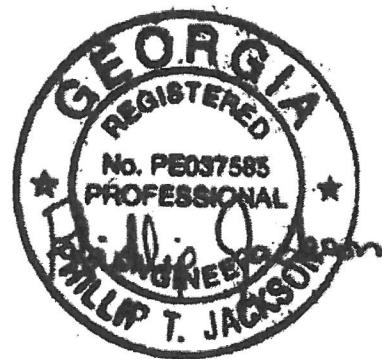
For  
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## **1 Site Description**

This report studies the Water Quality impact of developed run-off on this subject property.

This 1.06 acre site is proposed to be developed with four new detached residential homes.

Access to the property is from both Roswell Street and Hawthorne Avenue.

Typical on-site slopes ranged from flat to some 10% slopes. Drainage is typically northward from Roswell St to Hawthorne Ave.

## **2 Purpose**

The purpose of this study is to calculate and detail the size of individual Bio-Retention ponds, for each lot, with the houses along with their driveways, fully constructed.

The areas and flow rates calculated for the developed condition are based on the site being developed as shown.

## **3 Methodology**

Watershed area was determined by planimeter from topographic information supplied by the client and compiled from a client-provided topographic map, with surrounding areas enhanced by County GIS topo maps.

The hydrological analyses were performed by computer modeling of the appropriate watershed characteristics.

Although each lot has slight differences in driveway lengths, the footprints and roof drainage patterns are similar for all houses.

To simplify the design, we have determined the worst-case scenario, i.e. the longest driveway yielding the largest amount of impervious surface and applied this as a standard to all four lots.

## **4 Basin Information**

As mentioned above, all four lots have similar drainage patterns. Houses fronting Roswell Rd drains toward their rear lot lines. Proposed ponds will be located in their rear yards. Houses fronting Hawthorn drain towards their front yards. On these lots the ponds will be located in their front yards.

## **5 Recommendations & Water Quality Measures**

Due to the increase in introduction of impervious surface (rooftops, walkways and driveways), run-off from these surfaces will have to be captured and treated by means of some water quality device.

We propose the use of individual Bio-Retention ponds on each lot. As mentioned before, the worst-case scenario with the largest amount of impervious surface per individual lot, was equally applied to all lots.

These ponds will be 22' long x 10' wide with 4.3' deep filter media and a ponding depth of 9". All gutter downspouts off the roofs will be connected, underground, with a collector system and then connected to each pond with a drain pipe. No roof run-off will be allowed to surface drain towards the ponds. Run-off from the driveways will be allowed to surface drain, but it will sheet-flow over sodded yards, cleaning and settling out any debris, prior to reaching the ponds.

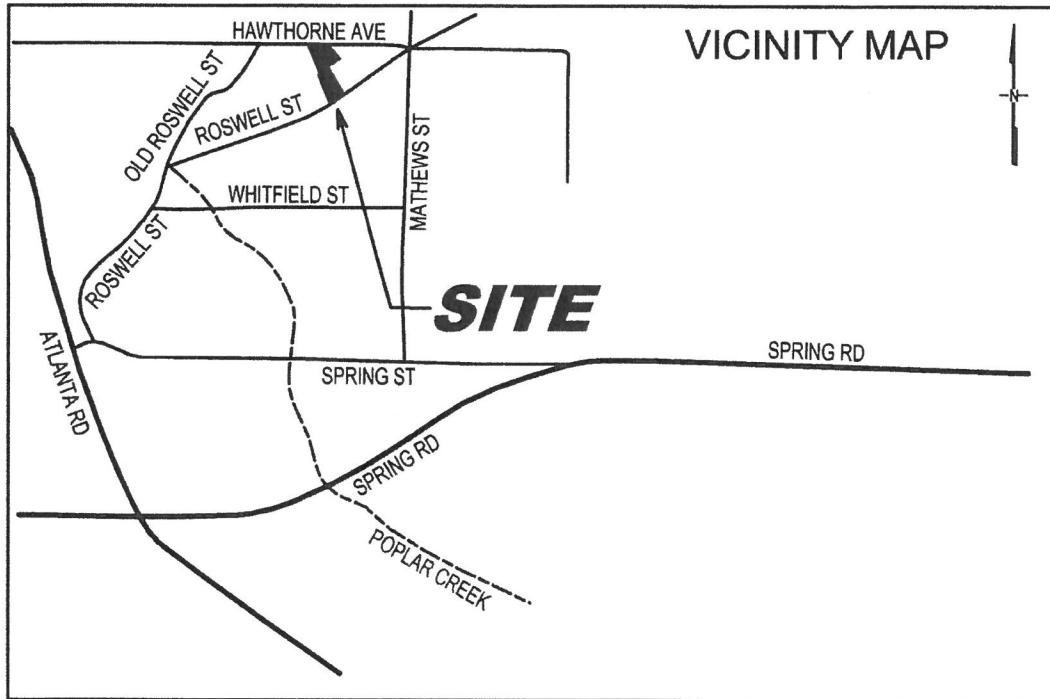
These ponds will be constructed at the lowest developed point on each lot, relatively parallel to the contour. They will have no outflow drains. They are sized to capture and detain the first 1.2" of rainfall from all hard, impervious surfaces. If they were to "fill up" and overflow, the length of the pond will cause it to act as a level spreader, allowing overflow to sheet-flow further downhill, in the same manner as the pre-developed condition.

## **6 Conclusions**

With the site developed as shown, and bio-ponds in place, the first flush from all impervious surfaces will be captured, treated and detained.

**No adverse effects are being anticipated to any other properties, downstream of these lots.**

VICINITY MAP



# HAWTHORNE AVENUE

[ R/W VARIES ]

R/W  
DEDICATION  
806 SF  
0.019 Ac

20'

EX.RW

S88° 05' 30"E

1066

PR.RW

98.63'

1064

TYP. BIO POND  
10x22x6' DEEP

160.00'

63.75'

1066

55.56'

1066

GARAGE

PORCH

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GARAGE

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## First Flush Volume (WQv) Calculations

### WORST-CASE LOT

#### Area # 1

0.30 Ac = Total area  
0.070 Ac Impervious  
23.3 % Impervious

#### Area # 2

0.00 Ac = Total area  
0.00 Ac Impervious  
0.0 % Impervious

0.3 Ac total area (A), with  
0.1 Ac total impervious.  
23.3 % impervious (I) to be  
captured by 1.2", First Flush

$$Rv = 0.05 + (0.009 \times I)$$

i.e.,  $Rv = 0.260$  then,

$$WQv = (1.2 \times Rv \times A)/12$$

i.e.,  $WQv = 0.008$  Ac-ft

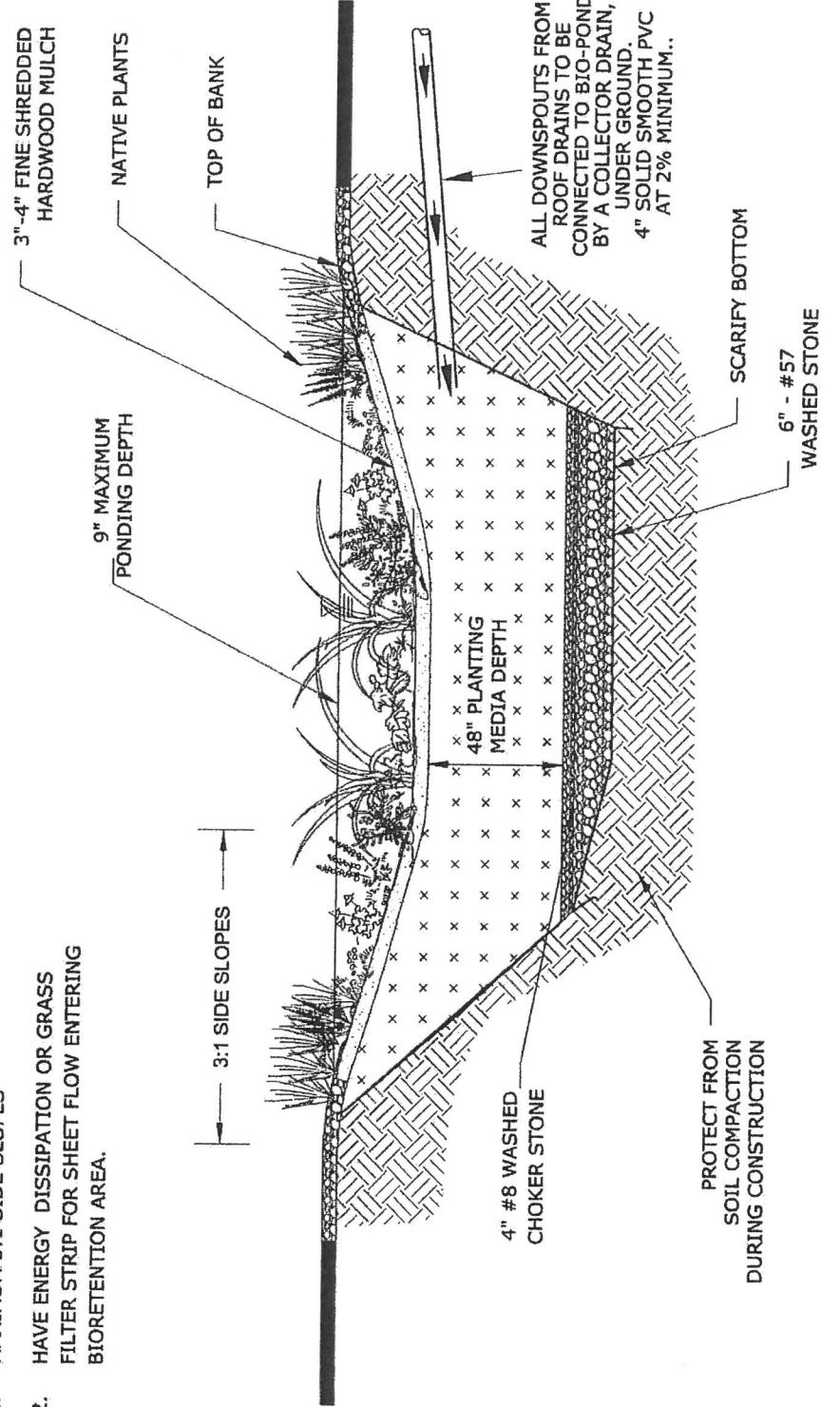
or, 340 cu.ft.

w/ 40% voids = 1058 cu.ft. required

440 CF available at  
elevation 5 ft in the pond  
for storage. Use 0 ft  
as typical bottom of pond.

NOTES TO DESIGNERS:

1. MAXIMUM 3:1 SIDE SLOPES
2. HAVE ENERGY DISSIPATION OR GRASS FILTER STRIP FOR SHEET FLOW ENTERING BIORETENTION AREA.



BIORETENTION WITHOUT UNDERDRAIN

### Bioretention Area Typical Routine Maintenance Activities and Schedule

Activity	Schedule
<ul style="list-style-type: none"> <li>• Prune and weed to maintain appearance.</li> <li>• Dissipate flow when erosion is evident.</li> <li>• Remove trash and debris.</li> <li>• Remove sediment and debris from inlets and outlets.</li> <li>• Remove and replace dead or damaged plants.</li> <li>• Mow around the bioretention area as necessary, ensuring grass clippings are not placed in the practice.</li> <li>• Observe infiltration rates after rain events. Bioretention areas should have no standing water within 24 hours of a storm event.</li> <li>• Inspect for evidence of animal activity.</li> <li>• Inspect for erosion, rills, or gullies and repair.</li> <li>• Inspect filter strip/grass channel for erosion or gulling, if applicable. Re-seed or sod as necessary.</li> <li>• Inspect trees and shrubs to evaluate their health, and remove and replace any dead or severely diseased vegetation.</li> <li>• Obtain a mulch depth of at least 3 to 4 inches should be inspected and obtained. Additional mulch should be added as necessary.</li> </ul>	As needed or 4 times during growing season
<ul style="list-style-type: none"> <li>• Trim planting material.</li> <li>• Inspect for snow accumulation.</li> </ul>	Semi-annually in spring and fall
<ul style="list-style-type: none"> <li>• Test the planting soils for pH levels. Consult with a qualified licensed Professional to determine and maintain the proper pH levels.</li> </ul>	As needed or during winter months
<ul style="list-style-type: none"> <li>• Replace/repair inlets, outlets, scour protection or other structures as needed.</li> <li>• Implement plant maintenance plan to trim and divide perennials to prevent overcrowding and stress.</li> <li>• Check soil infiltration rates to ensure the bioretention area soil is draining the water at a proper rate. Re-aerate or replace soil and mulch layers as needed to achieve infiltration rate of at least 0.5 inches per hour.</li> </ul>	Annually
	2 to 3 years

