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**John and Leslie Mackowiak
1025 Pinehurst Drive
Chapel Hill NC 27517**

May 16, 2006

Dear Board Members, Commissioners, and Town Council Members,

My wife and I live at 1025 Pinehurst Drive, located between the Oaks and Meadowmont on Pinehurst. With 2 children in college, we are in the process of downsizing. Part of that strategy is to subdivide our existing 4.7-acre lot, sell our existing home, and build a smaller more economical home on one of the subdivided lots. Our current property tax bill of almost \$30,000 in 2006 was a significant incentive to subdivide and downsize soon.

History and Timeline: The existing 4.7-acre lot was once a part of the Meadowmont Dairy Farm owned by DuBose. It was sold to JP Goforth, who sold the lot to Jim Heavner. We purchased this property in 1997 from Jim Heavner before the Meadowmont Subdivision was approved. We always had the goal of eventually subdividing. I met with JB Culpepper on 2/6/1997 to discuss potential future subdivision plans. The following table summarizes our subdivision process.

February 6, 1997	Initial meeting with JB Culpepper to discuss potential future subdivision plans.
	Pre-concept plan meeting with town planning staff
July 2005	Concept Plan submitted for review by the town staff and the CDC
August 17, 2005	CDC Meeting
November 7, 2005	Preliminary Plan was submitted
January 5, 2005	Responses from staff (45 items)
February 22, 2006	Revisions submitted
March 16, 2006	Responses from staff (21 items)
April 14, 2006	Revisions submitted
May 14, 2006	Responses from staff (4 items)
May 16, 2006	Revisions submitted
June, 2006	Boards and Commissions
September, 2006	Town Council Decision

We have accepted almost all of the suggestions that have been received, and have made these revisions to the plans. I will not review each of the 70 items that were recommended, and the various concessions or revisions that have been accepted. The net result of the CDC and extensive staff review process to date is described below, and is shown on the 7-page Preliminary Plan. The LUMO intends that the plans be preliminary at this point. Final engineering details and construction drawing will be proposed and reviewed by Town staff if the preliminary plans are judged to be in agreement with the existing LUMO, and approved by the Town council. We anticipate a Chapel Hill Town Council decision on the Preliminary Plan in September of 2006, more than a year after a concept plan was submitted.

Subdivision and Street Name: **Aquabella** is the name we have selected for our subdivision. This name was selected as an alternate to Waterbury Way, which was not allowed because it might be confused with Waterford. New Water Way was another alternative that was proposed. Our name was selected to describe the focus of the subdivision, which is to be a leader in the use of “low impact development” techniques. The existing LUMO (section 5.4.7) states “Low Impact Design options are encouraged.” These techniques were developed to protect our environment, especially our streams and waterways. Depending how OWASA develops its “WaterWise subdivision” guidelines, we may become one of OWASA’s first WaterWise subdivisions. The guidelines are likely to focus on conservation of drinking water, reduction in wastewater volume, and possibly innovative stormwater practices.

The name we have selected for our road is **Shelbourne Court**, named after the historic Shelbourne Hotel, which we visited in Dublin, Ireland. The Shelbourne is a traditional urban hotel, yet it overlooks the beautiful St. Steven’s Green, a beautiful emerald green park with water features within Dublin. After the Irish Revolution, the Irish Constitution was drafted in the Shelbourne Hotel in 1922. Its history from 1824 is an inextricable part of Dublin’s literary, culinary, and artistic tradition. The harmonious blend of the urban hotel with the beautiful park typifies the environmental goals of the Aquabella Subdivision.

Site analysis. The site is a 4.7-acre lot within R-1 zoning. The land is not in any existing subdivision, but is located between the Oaks and Meadowmont subdivisions. The existing road frontage is on Pinehurst Drive. The section of Pinehurst in front of this property has been classified as a “local” road, which typically has a ROW of 45’, however a 90’ ROW was dedicated to the town by JP Goforth, the developer of the Oaks. At the opposite end of the lot, away from the Pinehurst Drive, the lot has beautiful views of the ponds on Chapel Hill County Club golf course, and borders the 11th hole. Our brick home, accessed via a gravel driveway, is located at the back of the lot. The land does not contain steep slopes that would limit development.

The land has one immediate residential neighbor on each side, with each of the existing homes taking advantage of the golf course and pond views. The relationship to the Oaks, Meadowmont, and the golf course can be seen in the aerial photo below.



The site was once part of the Meadowmont Dairy Farm. Remnants of barbed wire fences, and dirt farm roads still remain. It was primarily pasture or row crop fields years ago, which has now been overgrown into a very young pine forest. There were some large shade trees in the pasture, which still remain. Most of these are located on lot 1, at the lowest elevations of the parcel.

Town of Chapel Hill Stormwater Staff have classified the drainage way on the property in such a way that 50' of land on either side of the drainage way will be dedicated as a RCD if the land is subdivided. Efforts are underway to work with neighbors to restore the hydrology of the area back toward pre-Meadowmont conditions, and to reduce water-born urban pollutants that are sent through the property. This RCD Corridor is shown on the subdivision plan.

Development Proposal. The Subdivision Plan describes the division of the existing lot into 4 lots, with each new lot having frontage on a newly built street (Shelbourne Court). The existing home will remain on lot 3, with approximately 1 acre of land. A new golf course-view lot of 0.5 acres will be created in lot 2. Lots 1 and 4 (1.4 acres each) will have frontage both on Pinehurst Drive and the proposed Shelbourne Court.

Marketing Plan. We plan to build a new smaller empty nester home for ourselves on lot 2. When that new home is ready for occupancy, our plan is to sell our previous home, which is located on the proposed lot 3. We plan to retain ownership of the empty lots 1 and 4, and do not have any plans to build on or sell those lots at this time.

Road: The new road (Shelbourne Court) will be accessed from Pinehurst Drive, and end in a cul-de-sac on the ridge that divides the lot into two drainage basins. The road will be the standard 27 feet wide road in a standard 45-foot right of way. This easily allows sidewalks, 2-way traffic, street parking and access for emergency vehicles. The cul-de-sac radius is the standard 40 feet.

Prior to moving to our existing home, we developed our appreciation for Chapel Hill's architecture by living in the historic district close to the Horace Williams House on Franklin Street. We also own a historic Chapel Hill home at 602 S Columbia, originally owned by the developer of the Westwood neighborhood, one of Chapel Hill's older "subdivisions". We enjoyed going for walks in the historic part of Chapel Hill because each street seemed to have its own character and charm, partly because the diversity of the residents who built the homes, and the changes in styles while the neighborhoods were being established through the decades.

It is our goal to stay within the town's traditional design style, yet allow Shelbourne Court to have a look that is distinct from the neighboring Oaks and Meadowmount neighborhoods. We propose to achieve this unique character by employing a standard valley gutter (similar to the one used in Northside Park off Homestead Road). The short length of the cul-de-sac should allow a valley gutter to carry the volume of storm water produced. The standard gutter would be used in the intersection with Pinehurst Drive, and would transition to a valley gutter after the road reaches its 27-foot width and after it begins its ascent to the cul-de-sac.

We propose to build a brick sidewalk (budget permitting) connecting to the sidewalks on Pinehurst Drive. The brick sidewalk would be built according to the existing town standards with minor modifications to increase strength and durability. The homeowner's association would have the responsibility for maintaining the brick sidewalks.

Lighting: We propose to place a light at the intersection and a light at the cul-de-sac, and one at the midpoint along Shelbourne Court using the “6 sided traditional” fixture below from Duke Power on a fiberglass pole. This fixture is highly recommended by Jim Edwards, lighting specialist with Duke Power, due to its cut off features and excellent light profile.



The advantage of this light is that it minimizes light pollution (all light shines down) and it minimizes glare for drivers (because the lamp is housed high up into the cap, and is not readily visible to drivers as they drive by (as can be seen in the top picture). It is a standard light offered by Duke Power. These would be located within the ROW, and after installation, they would be maintained by the town. We are not proposing the use of any Cobra lighting on a fiberglass or wood pole.

By incorporating the curb, sidewalk, and lighting design elements, we feel Shelbourne Court would have a unique appearance, yet would remain within the town's design standard.

Parks and Open Space: Our initial offer of 7.1% (16,011 square feet) of Park Space within the Subdivision was not acceptable to staff, so a Payment in Lieu will be offered according to the formula that was recently approved by the town. If the pedestrian path is required we anticipate this will provide a slight reduction to our required payment. The approximate value of the payment will be \$100,000.00. This equates to approximately \$33,000 for each new lot created. A typical 4-lot subdivision in Chapel Hill does not require dedication of parks and open space, however because we are proposing the building and dedication of a 0.5-acre cul-de-sac, the rules governing a major subdivision apply.

Stormwater Management: This subdivision will be known as a leader in stormwater techniques that are designed to help improve the environment. We plan to showcase these features so neighbors and other developers can easily see how they have been incorporated into the “low impact design.” This will be specially useful for school children from Rashkis elementary who will see these features and how they work in response to rain events, quickly filling with a shallow pool of water, then emptying over the next 24-48 hours as the water is purified and released slowly into the drainage way. They will see how rain goes directly from roads into our streams. They may eventually realize that limiting the amount of impervious surfaces will decrease the amount of stormwater and the associated pollutants that we send into our waterways.

Over the past 3 years, since Meadowmont has been built, we have noticed a significant increase in the rate and quantity of stormwater that passes through our drainage way the day after a rain event. We can only expect that the amount of pollutants in the urban stormwater have also increased from their pre-Meadowmont levels. Meadowmont did not incorporate these innovative “low impact design” techniques.

Existing Stormwater Practices. After investigating the reason for the sudden increase in stormwater, I have observed that original waterways on the DuBose (Meadowmont) property have been diverted to allow for additional homes. Lots have been graded and made steeper to allow for basements and additional square footage. Builders have been caught dumping their stormwater from rooftops into OWASA sewers. After they were caught, they pooled multiple gutter drains into larger pipes, ran the pipes across multiple lots, and directed these large volumes of water as concentrated flows. The town has not been able to correct this inappropriate management of stormwater in the watershed. The consequence of these inappropriate practices is that neighbors use drinking water to irrigate their lawns, and send untreated rainwater containing Nitrogen and Phosphorous via pipes to local streams. Before I started the subdivision process, I was oblivious to these practices, and was not aware of the negative consequences on the environment.

As suggested by the subdivision name, Aquabella, we have already begun efforts to improve stormwater management in our local area, and to make the waterways beautiful again. During a rain event, the increase in water velocity coming from Meadowmont rooftops through their over use of pipes, rapidly sends large volumes of water from selected rooftops (via large pipes) almost directly to our property in minutes. It would be preferable to allow this water to be released directly onto the ground near each downspout that originated the water, and potentially infiltrate into the ground. Even if all of it does not infiltrate, the rate at which it would reach the drainage way would be slower if it travels in sheet flow across a lawn or natural area, or in a vegetated swale. The

current overuse of plastic pipes to quickly move water has exacerbated the stormwater issues.

Watershed Improvement Program. I have solicited the assistance of researchers from NC State (Dr William F. Hunt and his graduate students) and the NC Cooperative Extension Service (Mitch Woodward) to educate the neighborhood about stormwater issues and potential solutions. This first education session was attended by almost a dozen neighbors, and was held on 4/10/2006 at the Meadowmont clubhouse. With the consent of the neighbors, the experts returned on 5/12/2006 to develop a comprehensive stormwater management plan for the Meadowmont watershed up gradient from my property. This plan will be converted into a proposal and funding will be sought. If neighbors continue to support the concept, and sufficient funding can be obtained, a number of rain gardens will be built in Meadowmont. This will decrease the volume and rate of water that flows through the Aquabella drainage way, and improve its quality.

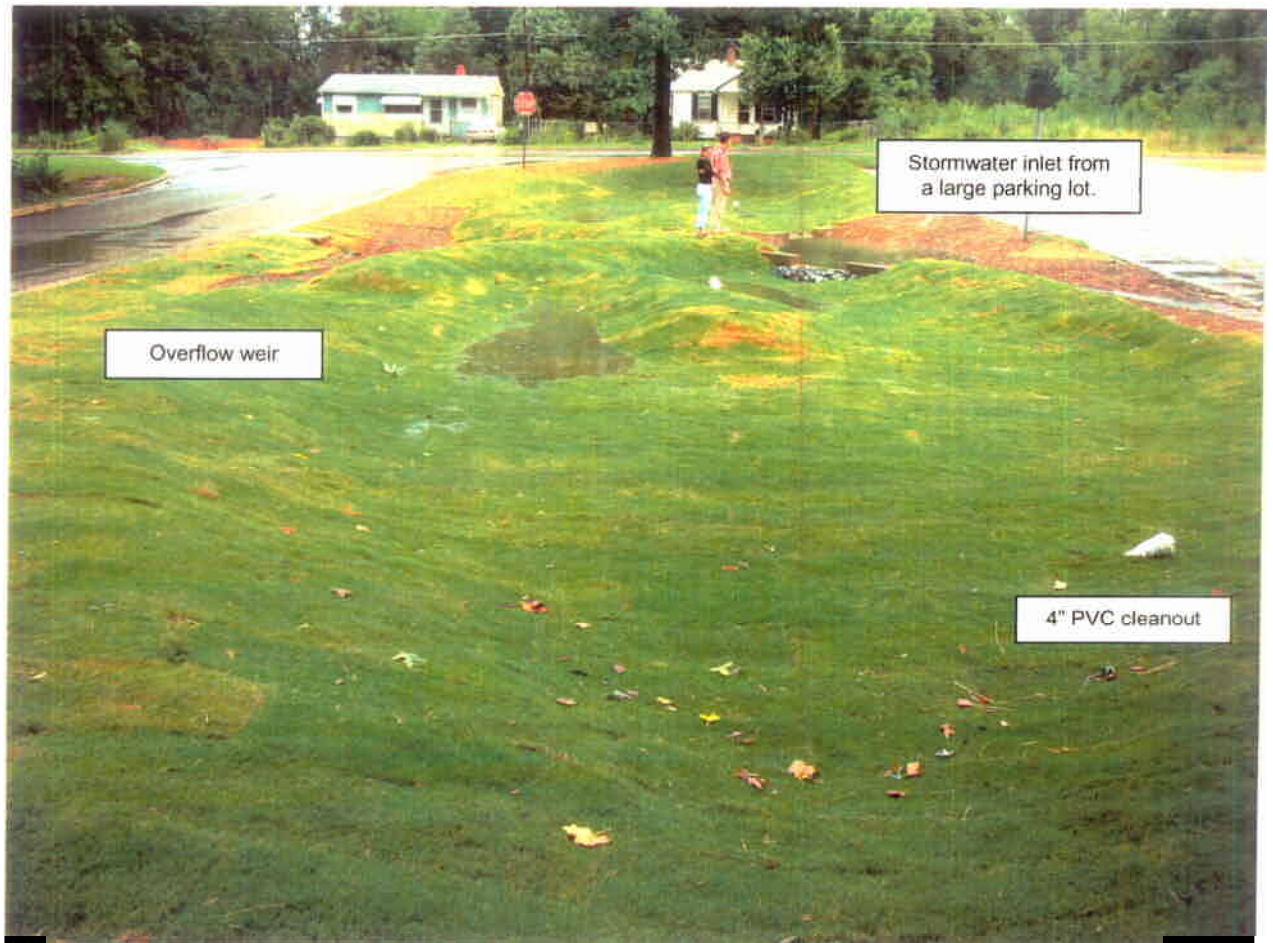
Stormwater Research Program. I have initiated scientific research on my property to measure the volume and rate of water that enters my property after each rain event. This research is a component of an EPA funded research grant led by Dr William F Hunt from NC State. We plan to keep the scientific equipment in place to measure the effects of any rain gardens that have been installed in the watershed. While previous research projects across the country have measured the effects of individual rain gardens, no research to date has ever tested the impact of multiple rain gardens and stormwater practices in one watershed working synergistically as a unit. If we can complete and publish this project, it will be the first such research published, ever.

Vegetated Swale. Across my property, I have already begun restoring the vegetation that once existed in the drainage way. The use of a vegetated swale can decrease the TSS (total suspended solids) flowing through the waterway by approximately 40% per 100 feet of swale. The speed of the stormwater flowing through a vegetated swale is greatly reduced, decreasing erosion, and potentially increasing infiltration and evapotranspiration (removal of water from the watershed through evaporation by plants).

Rain Gardens. The most significant impact we propose to have on water quality improvement is by building 2 rain gardens (also called bioretention areas) to purify the water after it runs off the new Shelbourne Court. The purified water is then returned to the waterway. Our comprehensive proposal will exceed the requirements for water rate, volume and quality. In addition to treating water that comes from Shelbourne Court, we also propose to treat water coming from an existing section of Pinehurst Drive. This exceeds the minimum requirements set forth in the existing LUMO.

The grass rain gardens will have an appearance similar to this one in Alamance County. The small puddle with raindrops showing on the puddle surface indicates the rain garden is functioning properly. Most other rain gardens have been built with woody plants (trees and bushes), and require annual mulching. We propose to use the latest in NC State rain garden design using turf as a way to decrease maintenance and improve stability of the rain garden.

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Raid Garden Location. In order to achieve the maximum possible water quality improvements exceeding the town requirements, the experts from NC State have recommended that the rain garden be located in what is currently the grass area along the Pinehurst Drive ROW. While no LUMO regulation prohibits the placement of a rain garden in a ROW, the Town staff has not approved such a placement since the revised LUMO was passed requiring the use of these stormwater features. Town staff were recommending against placing a rain garden in the unused portion of this ROW to improve water quality. We are asking the Town's Board Members, Commissioners, and the Town Council Members to support the use of a rain garden in the ROW to treat the water that would be coming off of the future town road.

The reason why we feel it is justified in this case is that a 90' wide ROW for Pinehurst Drive was dedicated when the Oaks was first developed. At that time, there was a possibility that Pinehurst would be expanded to be a major collector or arterial road to the DuBose property. This strategy was reversed when Meadowmont was approved. Instead, this 27' wide section of Pinehurst was classified as a local road when it was built. A local 27' wide road is normally placed in a 45' ROW, not our 90' wide ROW. The 27' wide local road was built instead of the 41" extra-wide Pinehurst Profile that was initially built in Oaks II. Multiple traffic calming measures had to be added to this overbuilt 41' wide

Pinehurst. It is highly unlikely that Pinehurst will be widened past the Aquabella subdivision and through Meadowmont. For these reasons we recommend the unused portion of the ROW be used to treat stormwater, and to educate the public regarding the latest techniques to manage stormwater.

Stormwater Flumes vs. Curb Inlets. In some of the earlier recommendations from town staff, they requested curb inlets for storm water in place of the flumes that we proposed. This staff suggestion would result in an outcome that is in direct opposition to the LUMO passed by Town Council stating requiring that (article 3.6.3 (g) (2)) “Wherever practicable, no stormwater discharge shall be allowed directly off an impervious surface into a stream channel.” For this and other reasons, we continue to propose flumes. When this section of Pinehurst Drive was built 4-5 years ago, the excavation for Pinehurst was so extreme that the road surface is located approximately 2.5 feet above the parallel drainage way. Given this small amount of vertical distance, curb inlets are not feasible unless stormwater is dumped directly into the drainage way. Flumes would allow water to stay on the surface and enter the top of a rain garden to be treated before the first flush of dirty water from the road can enter the waterway.

Pedestrian Connectivity: We propose to build a natural pedestrian path through the Meadowmont buffer as a means of pedestrian access from these subdivisions (Oaks, Aquabella, and Meadowmont) to the nearby schools and fields. In retrospect, this path should have been developed by Meadowmont long ago. Currently, school children cut through the Meadowmont yards (Chansky, Brown, Lindsey) to take the quickest path from Pinehurst Drive to Simerville. This logical shortcut for children can be easily seen in the aerial photo on page 3 of this letter. I am working with one of these neighbors, Mrs. Brown, to select and plant hedges to prevent such traffic, but I am doubtful this will have any impact until an alternate route is provided. We have drawn a pedestrian connection to the Fairway Hill (Rayfield) Subdivision on our plan, but we do not recommend this as the best alternative for pedestrian access to the schools and soccer fields. Even if this pedestrian path is dedicated, it is not likely to get much use. A more direct route for Meadowmont pedestrians should be provided via the existing buffer. We ask that you not accept this proposed path, and instead require us to work with the Meadowmont Homeowners Association to build a path through the existing buffer.

Conclusion: We ask that you recommend the approval of our subdivision as proposed, including:

- a) the use of the space along Pinehurst Drive as a rain garden, and
- b) the adoption of a path through the existing buffer as a better alternative, in lieu of a path to connect our cul-de-sac to the Rayfield property.

Comparison of 2 locations for BMPs to handle run off from Aquabella ROW.

Purpose: The purpose of this analysis is to compare 2 locations for a BMP to determine 1) the volume of stormwater that would be treated in each location and 2) the percent increase in treated stormwater with a ROW location (Option A).

Option A: Place the BMP for the road and sidewalk surface in the ROW.

Option B: Place the BMP for the public road and sidewalk surface on private property uphill from the RCD, allowing some water to be untreated.

Option C: the third option of moving the property line so that the necessary portion of the ROW is converted to private property was not viable and was eliminated because the acquired land would fall within the setback and the RCD.

Assumptions:

1. A vegetated swale could be placed uphill from the sidewalk so that stormwater run off from the private property does not enter the public ROW & BMP.
2. The BMPs in the ROW (Option A) may be situated in such a way to be able to treat previously untreated water from Pinehurst Drive in Meadowmont.
3. The BMPs will be sized to store the first flush design storm (at least 1.0 inches).
4. The options will be compared on the basis of gallons treated per rain event, gallons treated per average year, and the % of additional stormwater treated by putting the BMP in the ROW. (See blue cells)

Values can be entered into the yellow cells. Other cells are calculated.

P=inches of precipitation/event 1.0 inches

CN = Curve number

$S = 1000 / (CN - 10)$ (eq. 2-4 in ToCH design manual)

S=Storage component

$R/O = (P - 2S)^2 / (P + 8S)$ (eq. 2-3 in ToCH design manual)

R/O = runoff (portion of water that runs off: range 0-1.0)

Comparison of 2 options for a 1" event

	Road and sidewalk				Utility easement/lawn				total		Comparison of Option A vs. B			
	impervious area (sf)	CN	S	R/O	sf-in	gallons	Pervious area (sf)	CN	S	R/O		sf-in	gallons	
Option A	23,954	98	0.20	0.79	18945	11841	7,185	80	2.50	0.08	599	374	Option A	4191 more gals.
Option B	15,778	98	0.20	0.79	12479	7799	4,310	80	2.50	0.08	359	224	Option B	52% more gals.

Comparison of 2 options for a average year of rainfall

Option A	23,954	98	7,185	80	213,457	Option A	70,198 more gals.
Option B	15,778	98	4,310	80	143,258	Option B	49% more gals.

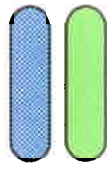
BMP	% of total		ponding depth (in)	min area (sf)	BMP	% of total		ponding depth (in)	min area (sf)	\$/sf of BMP	Cost to build
	vol.	vol.				vol.	vol.				
Option A	45%	9	977	9	southern	55%	9	9	1194	\$20.00	\$43,431.35
Option B	50%	9	713	9	southern	50%	9	9	713	\$20.00	\$28,529.06

Note: Approximately 20% of water from a bioretention cell is lost by evapotranspiration. Evapotranspiration is maximized in a sunny ROW location.

(45)

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LEGEND / AREA



Impervious 23,954 ft²
Pervious 7,185 ft²

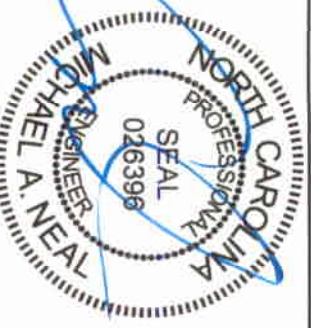


Pine & Mixed Trees
Hard Wood Stand

N.E.
Michael C. Shapira
PIN 97960770
TNBL 7.548 D.4
DB 1258215

N.E.
Chapel Hill Country Club
PIN 97960775
TNBL 7.542 D.8
DB 1258215

N.E.
H. E. Landmark
PIN 97960751
TNBL 7.542 D.8
DB 1258215



DATE: 7-10-06
MICHAEL A. NEAL, PE 026396
PLST-2783

AQUABELLA - Option A
Post Development
Scale 1:100 - Date 07/2006



LEGEND / AREA

	Impervious	15,778 ft ²
	Pervious	4,310 ft ²

Pine & Mixed Trees
Hard Wood Shrub

N.F.
Michael C. Shopp
PIN 07960070
TMBL 7345104
DB 1206215

N.F.
Clayton Hill Country Club
PIN 07960070
TMBL 7345104
DB 1206215

N.F.
H.E. Reynolds Jr.
PIN 07960070
TMBL 7345104
DB 1206215



DATE: 6-7-06
MICHAEL A. NEAL, PE 026396
PL S.L. 2783

AQUABELLA - Option B
Post Development
Scale 1:100 - Date 07/2006



Annual Rain Fall Data

first flush treatment level =
multiplier to change the amount of rain per event
composite combined

	CN	area (sf)	S
Option A	93.85	31139	0.66
Option B	94.14	20088	0.62

1.00 inch (only enter values > 0.00; 1" is customary)
1.08 annual rainfall in model 46.5911

30 year average rainfall 46.59
difference from average 0.0011

additional gallons treated with Option A
% increase in gallons treated with Option A

				Option A (ROW)			Option B		
	event #	2005 rainfall (in)	month subtotals	modified precip. (in)	treated precip. (in)	treated		treated	
						R/O (in)	sf-in	R/O (in)	sf-in
Jan	1	0.04		0.04	0.04	0.01	425	0.01	246
	2	0.04		0.04	0.04	0.01	425	0.01	246
	3	2.2		2.37	1.37	0.81	25240	0.83	16688
	4	0.38		0.41	0.41	0.08	2582	0.09	1797
	5	0.04		0.04	0.04	0.01	425	0.01	246
	6	0.13		0.14	0.14	0.00	4	0.00	8
	7	0.01		0.01	0.01	0.03	843	0.03	511
	8	0.6		0.65	0.65	0.23	7063	0.24	4781
	9	0.1	3.54	0.11	0.11	0.00	27	0.00	9
Feb	10	0.07		0.08	0.08	0.01	161	0.00	84
	11	0.59		0.64	0.64	0.22	6833	0.23	4629
	12	0.04		0.04	0.04	0.01	425	0.01	246
	13	0.05		0.05	0.05	0.01	321	0.01	182
	14	0.11		0.12	0.12	0.00	8	0.00	1
	15	0.16		0.17	0.17	0.00	76	0.00	69
	16	0.12		0.13	0.13	0.00	0	0.00	1
	17	0.12		0.13	0.13	0.00	0	0.00	1
	18	0.41		0.44	0.44	0.10	3110	0.11	2151
March	19	0.35		0.38	0.38	0.07	2090	0.07	1464
	20	0.89	2.91	0.96	0.96	0.46	14385	0.48	9599
	21	0.35		0.38	0.38	0.07	2090	0.07	1464
	22	0.41		0.44	0.44	0.10	3110	0.11	2151
	23	0.68		0.73	0.73	0.29	8963	0.30	6036
							5602		3773

24	0.17	0.18	0.18	0.18	119	74	0.01	101	63
25	0.16	0.17	0.17	0.00	76	48	0.00	69	43
26	0.01	0.01	0.01	0.03	843	527	0.03	511	319
27	1.28	1.38	0.38	0.07	2120	1325	0.07	1485	928
28	0.47	0.51	0.51	0.14	4254	2659	0.15	2916	1823
29	0.06	0.06	0.06	0.01	234	146	0.01	128	80
30	0.21	0.23	0.23	0.01	375	235	0.01	287	179
31	0.16	0.17	0.17	0.00	76	48	0.00	69	43
32	0.04	0.04	0.04	0.01	425	266	0.01	246	154
33	0.88	0.95	0.95	0.45	14115	8822	0.47	9422	5889
34	0.81	0.87	0.87	0.39	12257	7661	0.41	8203	5127
35	0.03	0.03	0.03	0.02	546	341	0.02	322	201
36	0.12	0.13	0.13	0.00	0	0	0.00	1	0
37	0.32	0.34	0.34	0.05	1635	1022	0.06	1156	723
38	0.42	0.45	0.45	0.11	3292	2058	0.11	2273	1421
39	0.23	0.25	0.25	0.02	549	343	0.02	409	256
40	0.43	0.46	0.46	0.11	3478	2174	0.12	2398	1499
41	0.22	0.24	0.24	0.01	459	287	0.02	346	216
42	0.09	0.10	0.10	0.00	58	37	0.00	26	16
43	0.2	0.22	0.22	0.01	299	187	0.01	233	146
44	0.32	0.34	0.34	0.05	1635	1022	0.06	1156	723
45	0.32	0.34	0.34	0.05	1635	1022	0.06	1156	723
46	0.11	0.12	0.12	0.00	8	5	0.00	1	1
47	0.07	0.08	0.08	0.01	161	101	0.00	84	53
48	0.21	0.23	0.23	0.01	375	235	0.01	287	179
49	0.05	0.05	0.05	0.01	321	201	0.01	182	114
50	0.43	0.46	0.46	0.11	3478	2174	0.12	2398	1499
51	0.35	0.38	0.38	0.07	2090	1306	0.07	1464	915
52	0.05	0.05	0.05	0.01	321	201	0.01	182	114
53	0.06	0.06	0.06	0.01	234	146	0.01	128	80
54	0.62	0.67	0.67	0.24	7527	4704	0.25	5088	3180
55	0.34	0.37	0.37	0.06	1934	1209	0.07	1359	849
56	0.4	0.43	0.43	0.09	2930	1831	0.10	2030	1269
57	0.26	0.28	0.28	0.03	859	537	0.03	625	391
58	0.56	0.60	0.60	0.20	6157	3848	0.21	4182	2614
59	0.05	0.05	0.05	0.01	321	201	0.01	182	114
60	0.08	0.09	0.09	0.00	103	64	0.00	51	32

April

May

June

July	61	0.21		0.23	0.01	375	235	0.01	287	179
	62	0.05	2.57	0.05	0.01	321	201	0.01	182	114
	63	0.12		0.13	0.00	0	0	0.00	1	0
	64	0.12		0.13	0.00	0	0	0.00	1	0
	65	2.24		1.41	0.85	26425	16515	0.87	17460	10913
	66	0.25		0.27	0.02	750	468	0.03	549	343
	67	0.11		0.12	0.00	8	5	0.00	1	1
	68	0.05		0.05	0.01	321	201	0.01	182	114
	69	0.9		0.97	0.47	14655	9160	0.49	9776	6110
	70	1.06		1.14	0.00	6	4	0.00	10	6
August	71	0.07		0.08	0.01	161	101	0.00	84	53
	72	0.05	4.97	0.05	0.01	321	201	0.01	182	114
	73	0.18		0.19	0.01	171	107	0.01	140	87
	74	0.34		0.37	0.06	1934	1209	0.07	1359	849
	75	0.06		0.06	0.01	234	146	0.01	128	80
	76	2.42		1.61	1.02	31836	19897	1.04	20981	13113
	77	1.08		0.16	0.00	48	30	0.00	47	29
	78	0.78		0.84	0.37	11478	7174	0.38	7691	4807
	79	0.01		0.01	0.03	843	527	0.03	511	319
	80	0.72		0.78	0.32	9952	6220	0.33	6688	4180
Sept	81	0.25	5.84	0.27	0.02	750	468	0.03	549	343
	82	0.62		0.67	0.24	7527	4704	0.25	5088	3180
	83	0.16		0.17	0.00	76	48	0.00	69	43
	84	0.53		0.57	0.18	5501	3438	0.19	3746	2341
	85	0.07	1.38	0.08	0.01	161	101	0.00	84	53
	86	0.02		0.02	0.02	685	428	0.02	410	256
	87	0.71		0.77	0.31	9703	6064	0.32	6524	4077
	88	1.45		0.56	0.17	5328	3330	0.18	3631	2269
	89	0.23		0.25	0.02	549	343	0.02	409	256
	90	0.04		0.04	0.01	425	266	0.01	246	154
Nov	91	0.15		0.16	0.00	42	26	0.00	42	26
	92	0.05	2.72	0.05	0.01	321	201	0.01	182	114
	93	0.07		0.08	0.01	161	101	0.00	84	53
	94	0.17		0.18	0.00	119	74	0.01	101	63
	95	0.1		0.11	0.00	27	17	0.00	9	6
	96	0.16		0.17	0.00	76	48	0.00	69	43
	97	0.8		0.86	0.39	11996	7498	0.40	8032	5020

Dec	98	1.18	1.27	0.27	0.02	770	481	0.03	563	352
	99	0.35	0.38	0.38	0.07	2090	1306	0.07	1464	915
	100	0.42	0.45	0.45	0.11	3292	2058	0.11	2273	1421
	101	1.13	1.22	0.22	0.01	314	196	0.01	243	152
	102	0.03	0.03	0.03	0.02	546	341	0.02	322	201
	103	0.05	0.05	0.05	0.01	321	201	0.01	182	114
	104	0.78	0.84	0.84	0.37	11478	7174	0.38	7691	4807
	105	1.09	1.17	0.17	0.00	84	52	0.00	74	47
	106	0.61	0.66	0.66	0.23	7294	4559	0.25	4934	3084
	107	0.06	0.06	0.06	0.01	234	146	0.01	128	80
	108	0.02	0.02	0.02	0.02	685	428	0.02	410	256
	109	1.78	1.92	0.92	0.43	13364	8352	0.44	8930	5581
	110	0.04	0.04	0.04	0.01	425	266	0.01	246	154
	111	0.18	0.19	0.19	0.01	171	107	0.01	140	87
112	0.32	0.34	0.34	0.05	1635	1022	0.06	1156	723	
113	0.32	0.34	0.34	0.05	1635	1022	0.06	1156	723	
		46.59	Option A gls. treated=				213,457	Option B gls. treated=		143,258
		43.24								
		5.28								

Mackowiak Subdivision: Aquabella

Preliminary Plan Review
Planning Board
June 6, 2006

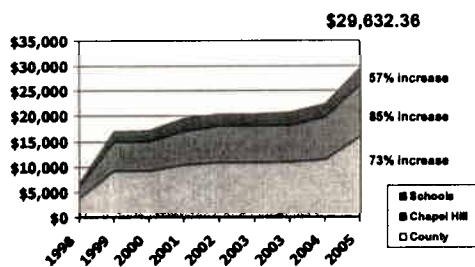
1

Mackowiak Subdivision Aquabella/Shelbourne Court

- ◆ Proposed by John and Leslie Mackowiak, homeowners for the past 7 years.
- ◆ 4.7 acre site with one existing home.
- ◆ Why are we subdividing?

2

Mackowiak Property Taxes



3

Map showing location in Chapel Hill



4

Pinehurst view to North (to Oaks)



5

Pinehurst View to South (to Meadowmont)



6

View up existing winding gravel driveway from Pinehurst



7

View of new pine growth on old Meadowmont pasture



8

View of our current home from proposed cul-de-sac



9

View from new lot 2 of golf course ponds



10

Developer's (Resident's) Program

- ◆ Create the new lot 2 for our new emptying nester home (2 of 3 children in college).
- ◆ Sell current home on lot 3.
- ◆ Retain lots 1 and 4. No plans to sell at this time.
- ◆ The new road prevents 4 new driveways emptying on to Pinehurst.

11

Requested Amendments to Resolution A

Critical Issue

- ◆ Rain Garden Placement & Design (page 8-9, stip. 27, 29)

Other Issues

- ◆ Buffer from Golf Course (page 7, stip. 15-16,43)
- ◆ Speed table placement (stip. 3)
- ◆ Recreation Requirement / Pedestrian path (stip. 11-14)

12

Why manage stormwater?



13

Stormwater LUMO (Laws)

- ◆ 5.4.1. (a)-Purpose: minimize increases in stormwater runoff in order to reduce flooding, siltation, and stream bank erosion.
- ◆ 5.4.1 (c)-Purpose: minimize the total volume of surface water runoff that flows from any specific site during and following development in order to replicate pre-development hydrology to the maximum extent possible.
- ◆ 3.6.3(g)2 "Wherever practicable, no stormwater discharge shall be allowed directly off an impervious surface into a stream channel."
- ◆ 5.4.7 "Low Impact Design options are encouraged." Consideration shall be given to the relationship between temporary construction facilities, and permanent facilities designed for permanent ongoing management.
- ◆ 5.4.8 Stormwater management facilities that are constructed on public land, within ROW, and/or within public easements shall be maintained by the public body with ownership/jurisdiction.
- ◆ 5.4.6 Stormwater treatment shall be designed to achieve average annual 85% TSS removal ... from the first inch of precipitation.

14

Site Specific Facts

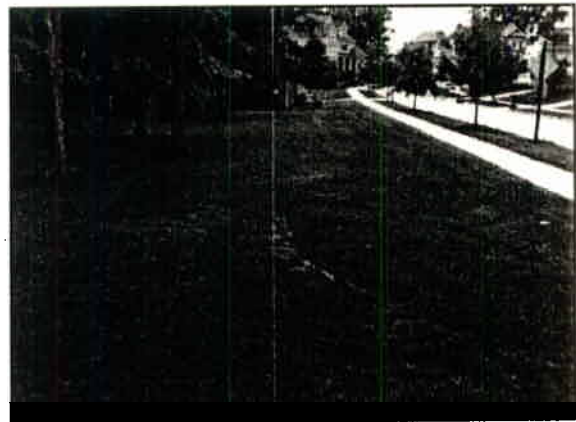
- ◆ Subdivision is located in the Lake Jordan watershed protection district (50% impervious surface maximum).
- ◆ Largest trees and a RCD are located in a potential place for a private-property storm water feature.
- ◆ The new road comes to its lowest elevation (where stormwater will naturally flow) within the existing 90' Pinehurst ROW before it reaches the RCD and lots 1 & 4.
- ◆ A Rain Garden (bio-retention) maximizes the pollutant removal capability of all BMPs applicable to this wooded site.

15

Storm Water Proposal

- ◆ The new road is approximately 310 feet long.
- ◆ Our proposed location for a rain garden achieves pollutant removal from 100% of the new road surface, plus a portion of the existing Pinehurst Drive.
- ◆ A pair of rain gardens sited above the RCD achieves pollutant removal from 58% of the road length (180' of 310').

16





Proposed Motion

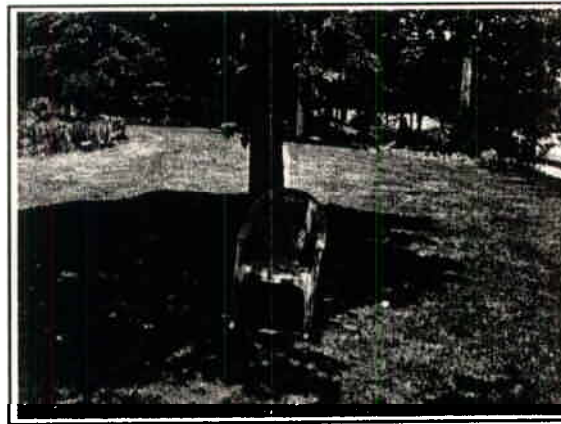
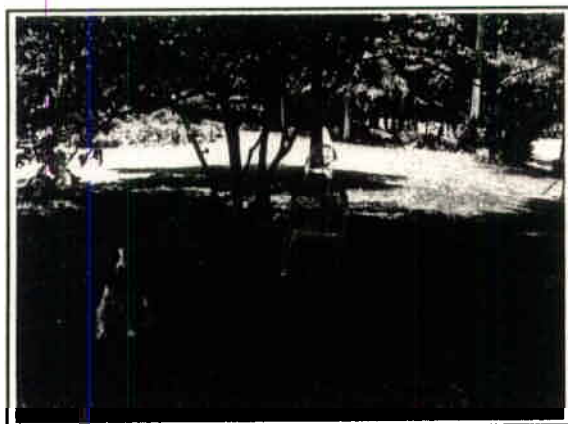
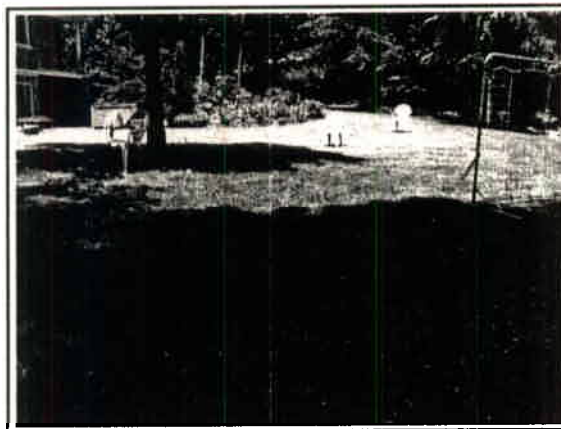
- ◆ The Mackowiak's should be allowed to maximize their stormwater management and exceed minimum regulations as proposed, and used the best available information from NC State University & Cooperative Extension. Staff should allow placement of the BMP in the existing Pinehurst ROW (with a maintenance agreement from the HOA), or staff should provide specific justification as to why maximal stormwater should not be managed, thus increasing stormwater runoff rates and volumes in this sensitive area of Chapel Hill.

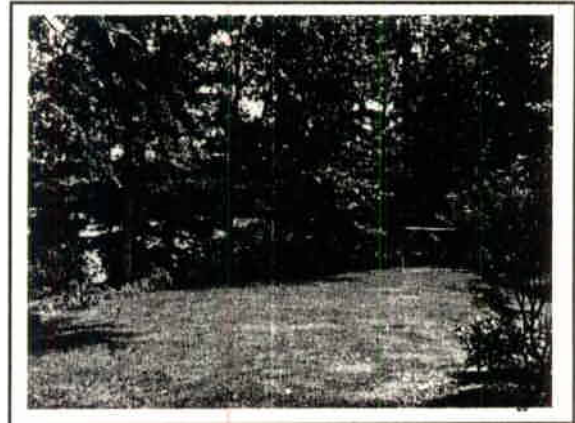
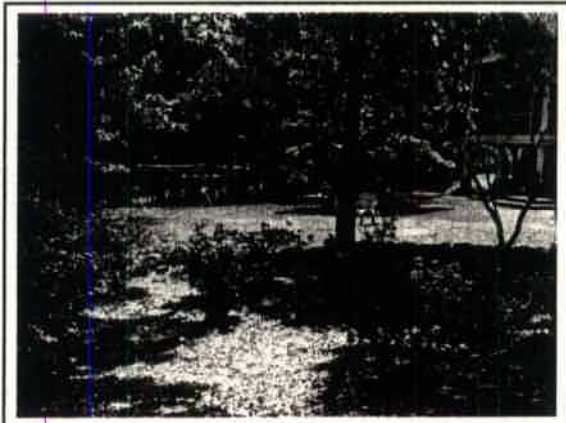
20

Buffer requirement

- ◆ The LUMO does not require HOA maintenance of a buffer. Because of the backyard location of the buffer, we believe this is not practical.
- ◆ We read the LUMO to require a 10' buffer, but staff is asking for 20'.
- ◆ We requested the existing backyard to be grandfathered and free of the buffer requirement.

21





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27

Speed Table Placement

- ◆ That the applicant construct a new speed table/hump, if necessary.

28

New recreation payment in lieu formula may be excessive

- ◆ $(208,044 + 17,460) \times 7.1\% = 16,011 \text{ sq ft}$
(land + Pinehurst ROW) X R1 %
- ◆ $16,011 \times \$4.65 \times 1.55 = \$115,399$
- Recreation area x \$/sq ft x multiplier =
- ◆ \$38,466 for each of 3 new lots created!!

29

Requested Amendments to Resolution A

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30