Hawk Pointe Golf Community
294 Route 31 South
Washington, New Jersey 07882

Attention: Rich Cotton

March 8, 2004

Re: Report on Hawk Pointe Expansion Feasibility – Task 1

Dear Mr. Cotton:

The purpose of this letter is to report on our findings regarding the feasibility of expanding the existing Hawk Pointe Wastewater Treatment Facility.

Background

The proposed wastewater treatment and disposal facility is located on Block 65, Lot 3, between State Route 31 and Asbury-Anderson Road in Washington Township, Warren County (see attached site plan).

The existing Hawke Pointe wastewater treatment facility has a NJPDES (New Jersey Pollution Discharge Elimination System) permitted design capacity of 82,000 gallons per day although the current TWA (Treatment Works Approval) Permit limits the flows to 27,000 gallons per day. The feasibility study identifies the availability of capacity for an additional 35,000 gpd from off site sources (Manekin, LLC) as well as an additional 25,000 gpd from on-site housing units for a total combined design capacity of 142,000 gpd (see attached flow calculations).

Findings and Observations

1.1 Wastewater Treatment System

The proposed project is intended to accept wastewater from the existing and proposed residential and commercial establishments as well as the existing golf course of the HPGC development. The intended ultimate capacity of the system is 142,000 GPD. Duplicate trains shall be provided in sewage treatment plants with design capacities of 100,000 gpd or more per NJAC 7:14-23. A treatment capacity of 99,000 gpd would be insufficient to supply either of the proposed additional capacities mentioned above; therefore, a feasibility study was conducted using a dual train system at 142,000 gpd.

A composite sample for influent wastewater characteristics was taken in December of 2003 while 20 single-family age restricted housing units were online. These

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RWE GROUP

values were combined with expected commercial wastewater characteristics and the following influent characteristics were used for the purpose of design:

Table 1: Influent Characteristics

Parameter	
◦ BOD_5	350 mg/l
◦ TSS	350 mg/l
◦ Total Nitrogen	65 mg/l
◦ pH	6-9

Treated wastewater will meet RWBR (Reclaimed Water for Beneficial Reuse) standards prior to discharge to either the infiltration or reuse ponds. Effluent quality at the point of discharge, which is immediately following the ultraviolet light (UV) disinfection units, is as shown in Table 2.

Table 2: Effluent Characteristics - RWBR Requirements

Parameter	
◦ UV	100 mJ/cm^2
◦ TSS	5 mg/L
◦ Total Nitrogen	10 mg/L
◦ Total Coliform (Instantaneous)	14 / 100mL
◦ Total Coliform (7 day median)	2.2/ 100mL

Wastewater will be collected from each of the commercial and residential buildings and conveyed by a collection system, consisting of a combination of gravity sewers and pump stations, to the treatment facility (influent pump stations along with any additions to the collection system are not included in this report or budgetary estimate).

The unit processes for this treatment system are:

- Flow Equalization
- Dual Train Four Stage Biological Treatment consisting of:
  - Anoxic Mix tank (2)
  - 1st Aerobic Mix tank (2)
  - 2nd Aerobic mix tank (2)
  - Membrane filtration with recirculation to the anoxic tank
- Ultraviolet Light Disinfection
- Flow Metering and Dosing Pumps to Disposal Beds

A feasibility study was conducted in order to determine the additional bioreactor volume, materials, and equipment needed to expand the existing Hawk Pointe

1.2 Budgetary Estimate

AWM has prepared an estimate of costs associated with the design and construction of the proposed wastewater treatment & disposal system. This estimate is to be used for budgetary purposes only and does not include any influent pump stations or additions to the collection system, which will be needed in order to transport the waste from the proposed on and off-site sources to the treatment facility. The budgetary estimate also assumes that Task 2, Preliminary Hydrogeologic Evaluation, for the proposed disposal area is favorable. If the proposed disposal area fails to meet required standards the scope of the project will need to be redefined. In addition $49,660.00 has been budgeted for the WQMP Amendment. This number is based on our recent experience with the DEP, Division of Watershed Management. AWM proposes to have a pre application meeting with the DEP and will revise this estimate as necessary.

Construction

Project Management:	$133,717.47
Site Work:	$ 42,090.21
CIP & Pre-Cast Concrete:	$397,144.16
Mechanical:	$153,037.02
Equipment:	$326,877.62
Electrical & Controls:	$346,286.01
Building:	$159,983.12
Disposal:	$162,548.61
Total Construction:	$1,721,684.22

Engineering

WQMP A & NJPDES:	$130,403.00
TWA:	$142,080.00
Engineering Const:	$ 97,200.00
Total Engineering:	$369,683.00
Total Budgetary Estimate:	$2,091,367.22

1.3 Regulatory Approvals & Permits

The regulatory approvals and permits necessary to construct, own and operate the system include, but are not limited to the following:

- WQMP Amendment
- NJPDES Permit Modification (New Jersey Pollution Discharge Elimination System)
- TWA (Treatment Works Approval)
- Building, Fire, Plumbing, and Electrical Permits
- CO (Certificate of Occupancy)

1.4 Water Reuse & Reclamation

Properly treated wastewater effluent can be used to augment potable water resources. Reclaimed Water for Beneficial Reuse (RWBR) involves treating wastewater to a high degree and using the high quality reclaimed water for beneficial uses. The NJDEP categorizes RWBR into four (4) systems, which may or may not be utilized by the Hawk Pointe Golf Community. These include:

Category I: RWBR – Public Access Systems (Highest degree of treatment)
- Spray irrigation of golf courses
- Golf cart washing
- Recreational irrigation of fields (baseball, soccer, football, parks)
- Irrigation of landscaped areas (residential lawns)
- Highway median strip irrigation
- Decorative outdoor fountains
- Fire protection

Category II: RWBR - Restricted Access/Non Edible Crop Systems
- Sod farms and pasturelands

Category III: RWBR – Agricultural Edible Crop Systems
- Only on crops which will be peeled, skinned, cooked or thermally processed.

Category IV: RWBR - Industrial systems/Maintenance Operations and Construction
- Cooling water/washing operations
- Dust control, washing of aggregate, cement mixing.

Conclusion & Recommendations

The primary technical constraint to expanding the plant is the ability to dispose of the treated wastewater. AWM proposed that a preliminary hydrogeologic evaluation for future disposal areas (Task 2) would be conducted upon completion of this feasibility study (Task 1) and after receiving authorization to proceed. This task will include a hydrogeological investigation of the soils to accept the treatment plant effluent and allow these flows to safely percolate into the sub-surface strata. There are two major tasks involved:

2.1 Under the direction of an engineer and a hydrogeologist, a series of test excavations will be constructed to evaluate and log soils at the site (test pits shall be excavated by others). The area that will be investigated is just west of the existing infiltration ponds (see attached site plan). The hydrogeological characteristics of the soils will be determined and a report section prepared. For the purpose of this preliminary investigation it has been assumed that there will be one day of test excavations.

2.2 One location within the favorable areas will be selected for basin infiltration testing. A pit will be excavated to the proposed infiltration zone, stepped for safety, and the bottom lined with 4" of concrete sand, for the 24 hour test run. A water source will be required. An attempt will be made to coordinate this effort with other work on the site to develop the needed water. The test would be conducted in a ten-foot diameter area at a constant head of 1 – 2 inches.

2.3 Prepare summary report of hydrogeologic investigation. A letter report will be prepared summarizing the results of this task.

If the results of this testing appears favorable, future hydrologic testing will be performed as part of a separate permit development effort. Task 2 (Preliminary Hydrogeologic Evaluation of Disposal Areas) can be performed within six (6) to eight (8) weeks from authorization, weather permitting. AWM will forward a proposal for this task under separate cover.

If you have any questions please contact me at (908) 431-7060 or Andy Zinkevich at (908) 431-7020.

Sincerely yours

Zach Gallagher
Project Engineer
For Applied Water Management, Inc.

Type of Establishment	Measurement Unit	Gallons Per Day	Number of Units	Total Flow Generated
Residential Dwellings (single family home, duplex units, townhouses, condominiums, apartments)				
Age Restricted 1 BR	per dwelling	110		0
Age Restricted 2 BR	per dwelling	170		0
Age Restricted 3 BR	per dwelling	225	330	74250
Assisted Living		100		0
Skilled Nursing		75		0
1 bedroom unit	per dwelling	150		0
2 bedroom unit	per dwelling	225		0
3 bedroom unit or larger	per dwelling	300		0
Transit dwelling units				0
				0
Hotels	Bedroom	75	25	1875
Lodging houses and tourist homes	Bedroom	60		0
Motels and tourist cabins	Bedroom	60		0
Boarding houses (max. permitted occupancy)	Boarder	50		0
Camps				0
				0
Campground/mobile rec. vehicle/tent	Site	100		0
Parked mobile trailer site	Site	200		0
Children's camps	Bed	50		0
Labor camps	Bed	40		0
Day camps--no meals	Person	15		0
Restaurants (including washrooms and turnover)				0
				0
Average restaurant	Seat	35	214	7490
Bar/cocktail lounges	Seat	20		0
Fast food restaurant	Seat	15		0
24 hour service restaurant	Seat	50		0
Curb service/drive-in restaurant	car space	50		0
Clubs				0
				0
Golf Member	rounds/day	25	25	625
Golf Guest	rounds/day	10	100	1000
Residential	Member	75		0
Nonresidential	Member	35		0

Racquet club	(per court per hour)	80		0
Bathhouse with shower	Person	25		0
Bathhouse without shower	Person	10		0
Institutions (includes staff)				0
				0
Hospitals	Bed	175		0
Other Institutions	Bed	125		0
Schools (includes staff)				0
				0
No shower or cafeteria	Student	10		0
With cafeteria	Student	15		0
With cafeteria and showers	Student	20		0
With cafeteria, showers and laboratories	Student	25		0
Boarding	Student	75		0
Automobile service stations				0
	per filling position	125		0
Service bays	per bay	50		0
Mini-market	Sq. Ft.	0.1		0
Miscellaneous				0
				0
Office buildings (gross area)	Sq. Ft.	0.1	190000	19000
Stores and shopping centers (gross area)	Sq. Ft.	0.1	350000	35000
Factories/warehouses (add process wastewater)	Employee	25		0
with showers, (add process wastewater)	Employee	40		0
Laundromats	Per machine	580		0
Bowling alleys	Alley	200		0
Picnic Parks (restrooms only)	Person	10		0
Picnic Parks with showers	Person	15		0
Fairgrounds (based upon average attendance)	Person	5		0
Assembly halls	Seat	3		0
Airports (based on passenger use)	Passenger	3		0
Churches (worship area only)	Seat	3		0
Theater (indoor)	Seat	3		0
Dinner theater	Seat	20		0
Catering/Banquet Hall	Person	20		0
Sports stadium	Seat	3		0
Visitor Center	Visitor	5		0

Total of ALL Flows	139249
Design Flow Used	142000