



MILL POND

MILL POND –
FHHA'S LANDMARK WATER FEATURE
NOVEMBER 2009

Over the past several months there has been a lot of discussion and brief articles written regarding Mill Pond, the community's landmark feature. President Mike Fletcher and the Board of Directors have assigned the restoration project of Mill Pond to General Manager Stephen Herr. Several standing association committees will be working with Manager Herr to explore the question of "how should the Association restore the pond?" Just last month the first management meeting was held at the pond to evaluate the current condition of the pond and upstream water quality facilities. Attendees were West Multnomah Soil & Water Conservation District planners and representatives from OTAK, who originally designed the facilities. It was evident that these facilities were no longer functioning as designed and immediate refurbishment is required. What restoration options are available to the Association? Who is responsible for the upstream facilities? How much will these restoration options cost? These are all good questions, which I hope to answer and Report back to the community through this series of articles.

Before we can move forward with the project I believe it is necessary to review the chronology of Mill Pond. "Part One" of this series will feature the historical background of Mill Pond before we start focusing on the best solution to restore our community's landmark water feature.

Part One - Mill Pond Chronology
Forest Heights Historical Facts

Forest Heights is a planned community in the West Hills of Portland, incorporated in 1989. It occupies 601 acres and consists of 1126 single family home lots, 676 town home and condominium units, 160 apartments and a small retail center. The Forest Heights Homeowners Association manages 215 acres of common area (11 acres of improved

landscaped areas), six (6) miles of hiking trails, Mill Pond and Mill Pond Park, including numerous private streets and several entrance monuments.

Mill Pond was originally the mill pond for the Jones Lumber Mill, located within the Mill Pond Park boundaries. Cedar and Oak trees were logged to provide the timber from the land that is now Forest Heights. Although the Jones family sold their mill in 1869, the original mill changed hands several times before finally closing in 1892 for lack of timber. Mill Pond now serves as a storm reserve facility and is subject to the oversight of several government agencies.

There were a number of wildfires that burned parts of the West Hills in recorded history, and parts of Forest Heights burned as recently as the 1950's.

The idea of Forest Park Estates (later renamed Forest Heights) was formulated in 1969, as the brain child of four men: Homer Williams, Rob Bissell, Roland Haertl and Neal Marlett. Although a group of local neighbors fought the project, finally, in 1983, the Oregon Court of Appeals cleared the way for construction of Forest Heights Estates.

Forest Heights Estates was first envisioned as a 1000-acre development. Homer Williams sold off 601 acres of the property to Nauru Phosphate Royalties, a corporate entity from the island nation of Nauru that was responsible for investment of the royalty money gained from the mining of phosphate deposits on the island. Nauru hired George Marshall and Dan Grimberg to handle the development work in Forest Heights. As a Planned Unit Development (PUD), Forest Heights is subject to the Planned Community Act (ORS 94), and the Association, as a not-for-profit organization, is subject to the Nonprofit Corporation Act (ORS 65).



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The developer of Forest Heights, Nauru Phosphate Royalties Inc. spent an enormous amount of money on all of the project components in order to create an outstanding neighborhood with lasting qualities. Every dollar that was invested in Forest Heights by Nauru was spent with the hope and expectation that the future stewards of the project would recognize those special elements (i.e. Mill Pond) that have created the very unique lifestyle for all residents to share.

Since the improvement of the pond in 1989, rapid development of the watershed has occurred on the Forest Heights property and other adjacent properties in the area. The Forest Heights development (FHHOA) includes approximately 56% of the land surface draining into the pond.

The community of Forest Heights (FHHOA) currently uses Mill Pond as a detention facility, recreation area and aesthetic amenity. Mill Pond provides a modified natural setting, public access, walking trails, and wildlife viewing opportunities.

Next month we will review the chronology of Mill Pond since the development of the pond in 1989.



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ARTICLE II—PART ONE
MILL POND CHRONOLOGY 1998 TO 2009

My November newsletter article explored the historical background of Forest Heights and the creation of Mill Pond. This article will focus on the chronology of the pond from the development in 1989 to its current condition. This will be a two-part article due to the amount of detail necessary to fully explain the twenty year evolution.

In 1989 as part of the Forest Heights Master Planned Community development a Master Drainage Plan was required. This was confirmed by the Water Quality Ponds report in 1996 prepared by Mike Peebles, Civil Engineer, Otak; the following are excerpts from his report:

As a part of the original Forest Heights development plan, three water quality ponds were proposed. These features were to have the dual function of protecting downstream water quality and providing a scenic resource for the residents of Forest Heights. The first feature, Mill Pond, was built in 1989. The pond and the park that surround it provide a focal point for recreation in the Forest Heights community. Families use the park for social activities and feed the waterfowl that are attracted to the pond. The pond has also proven to be an effective sediment trap. Mill Pond currently functions as both a sediment and storm water detention facility. The increased volume of water created by runoff from future development at Forest Heights will soon exceed Mill Pond's effective capacity for both requirements. Two additional water features are proposed as a means to augment the sediment detention and flow velocity reduction functions (but not the storm water detention function) of Mill Pond as well as provide a scenic and aesthetic resource for the surrounding areas. One new water feature will be located in each of the two major drainages that

feed into Mill Pond. The feature in the western drainage will be located just east of Mill Pond Road, approximately 1,700 feet north of Mill Pond. The water feature in the eastern drainage will be located just to the east of Miller Road, approximately 700 feet upstream of Mill Pond. These additional features will be "wet ponds" that will contain at least two feet of water all year. These new ponds are not intended to provide water quality benefits to areas downstream of the pond sites or the future school site, which will require inclusion of its own storm water quality treatment system that complies with BES standards. Mill Pond, however, will receive considerable benefit as a major portion of its current sediment load it trapped in the new ponds located upstream of it.

These wet ponds were designed with aesthetics components to benefit the scenic beauty of the community with the main criteria to position the ponds far enough down stream to capture the largest runoff of the watershed. The wet pond design guidelines were established by the Santa Barbara Hydrograph Unit = YJ of the 2-year storm event. The ponds were sized to contain (trap sediment) the first flush storm event and discharge the volume over a 24-hour period. Runoff in excess of this design storm is routed through the facility and is discharged through a 96" manhole overflow structure into Mill Pond.

The operation and maintenance of these water quality features required that they be inspected every year in the late summer or early fall to determine if maintenance is required and if enough sediment has accumulated to warrant removal. As a part of the yearly inspection, the features will be dewatered and all structures will be examined to verify their integrity, any debris that may obstruct water flow at inlets and outlets will be removed, and the depth of sediment at permanent sediment



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level markers will be determined. If it is determined that the sediment needs to be removed, equipment will be used that minimizes the impact to the vegetation around the pond edge to the maximum extent practicable. Once the sediment has been removed, it will be hauled to an approved landfill site for disposal.

To my knowledge no prior maintenance of the water quality features has been performed. Who's responsible for this maintenance? Otak believes there is documentation requiring the City of Portland to maintain these wet ponds. Currently the FHHA Board is evaluating a proposal from Otak to investigate this claim and to evaluate options for the restoration of Mill Pond.

Fast forwarding from 1989 through the next seven years of Forest Height development, the developer found it necessary to dredge Mill Pond in 1996. The application submitted to State of Oregon, Division of State Lands stated; *"The purpose of the project was to remove a large quantity of sediment deposited this past winter during the February storm events. The current condition of the pond is that its capacity has been reduced to the point that it does not function as designed. Failure to dredge the pond will result in water quality degradation in Cedar Mill Creek downstream of the pond"*.

Ken Leahy Construction Inc. dredged Mill Pond in 1996 exporting 11,300cy of sediment; total contract cost was \$217,435.96

Storm water runoff from paved surfaces, lawns and landscaped areas are directed into the two primary drainageways serving Mill Pond. Detention facilities have been constructed in these drainageways for water quality purposes. According to the Oregon Water Resources Department (OWRD) the original water right for Mill Pond reservoir was issued in 1988 with a capacity of 8.2 acre/feet. The pond now serves both storage and recreational functions.

In 1999 an investigative report was completed by PALSA, L.L.C. to address the concern about excessive annual aquatic weed and algae growth reducing Mill Pond's aesthetic qualities. Their report focus was limited to areas of the Mill Pond watershed contained within the Forest Heights development. PALSAs stream ecologist conducted a field examination of the vegetative, soil, and hydrologic characteristics, developmental distribution, and level of disturbance on the Forest Heights development and the Mill Pond Watershed in general. Specifically, qualitative information was collected regarding upland erosion, sediment transport and water quality. All field work was conducted during the months of October, 1998 through March 1999.

PALSA stated in their report; *"It is evident that soil from disturbed and developed portions of Forest Heights, including upland portions, enters on-site drainageways either by direct flow or through the existing storm water systems, existing storm water detention facilities trap a large portion of the suspended soil. It is likely that the majority of sediment reaching Mill Pond is transported during high flow (storm) periods. During the winter of 1998/1999 Forest Heights experienced substantial soil slumping in the areas associated with new construction, likely allowing large amounts of suspended sediment to be transported into areas lower watershed (Mill Pond). Hydrologic changes in the upper watershed and associated shifts in water quality and biological constituent among receiving waters such as Mill Pond are not uncommon to developed, urban areas."*

Existing conditions in the Mill Pond watershed present many challenges to ameliorating (improve) the currently eutrophic condition of the Mill Pond. Among these are the magnitudes of sediment reaching the Mill Pond reservoir, the unknown nutrient/water balance, and the unavoidable and current level of completed and ongoing urban development in the Mill Pond watershed.



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Rapid sedimentation of the Mill Pond is creating favorable physical conditions for productive growth of aquatic weeds and algae. Likewise, the potential nutrient loading of the pond fosters favorable chemical conditions. It is likely, at this time, that the largest source of nutrient income for the Mill Pond comes from external sources in the upper watershed due to soil erosion and urban runoff. It is conceivable, however, that as construction activities and soil erosion in the upper watershed diminish, and the largest source of nutrient income may come from internal sources such as nutrient cycling or leaching from sediments.

Some eutrophic(*) lakes and many reservoirs probably cannot achieve appreciable reductions in productivity levels (EPA. 1983). Either they cannot be protected from disturbance, or the users' expectations are not consistent with achievable conditions. Mill Pond will likely be a very difficult reservoir to revert to a less productive state. The task at hand is to consider the preferred end use for the pond, and determine whether it is compatible with the existing land use in the watershed.

(* Eutrophic definition "Having waters rich in mineral and organic nutrients that promote a proliferation of plant life, especially algae, which reduces the dissolved oxygen content and often causes the extinction of other organisms.")

With due consideration for the financial and practical limitations inherent in future uses of the Mill Pond, preliminary consideration has been given to low cost approaches to reducing the level of sediment entering the Mill Pond. Such efforts may focus on enhanced on-site construction Best Management Practices (BMP's), accelerated maintenance of detention facilities and sedimentation basins, and re-establishment of upland slope and drainage stability through intensive planting and

seeding efforts. A reduction in the level of sediment and nutrients contributed by the watershed is a necessary first step toward improving the aesthetic and biological state of the Mill Pond.

In summary PALSAs stated that "manmade reservoirs are inherently difficult water bodies to manage for the beneficial recreational and aesthetics uses of a community. The presence of persistent aquatic weeds and seasonal algae blooms in the Mill Pond are good indicators of a biologically productive and eutrophic system. Even without development in the watershed, it is likely that the Mill Pond reservoir would eventually become eutrophic albeit at a decelerated rate".

The PALSAs report then identified four potential Mill Pond management scenarios for consideration; some of these scenarios to revert Mill Pond to a less productive state may potentially be more expensive. These alternatives will be explored in the second part of this article in the January newsletter. I hope I've captured your attention; until next month.



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ARTICLE II—PART TWO
MILL POND CHRONOLOGY 1998 TO 2009

Last month I started to outline the chronology of Mill Pond from 1989 to present. This article is part two in a series of articles published in our Association Newsletter.

To review, the Association's agent commissioned a report by environmental consultant, PALSA LLC in 1999. This report noted that; 1) *Existing conditions in the Mill Pond watershed present many challenges to ameliorating (improving) the currently eutrophic condition of the Mill Pond.* 2) *Rapid sedimentation of the Mill Pond is creating favorable physical conditions for productive growth of aquatic weeds and algae.* And 3) *The task at hand is to consider the preferred end use for the pond, and determine whether it is compatible with the existing land use in the watershed.*

I concluded my December article (Part One) stating that the PALSA report identified four potential Mill Pond management scenarios for consideration; some of these scenarios by PALSA would revert Mill Pond to a less productive state. Let's explore these alternatives in more detail (paraphrased below).

Alternative #1 - Conversion of the Mill Pond to an Emergent Marsh - *This approach acknowledges the costly and technically difficult process of reverting the Mill Pond to a less productive state. Rather than combating the tendency of the pond to accumulate sediment and nutrients, encouraging development of an emergent marsh would take advantage of these processes and create enhanced growth and diversity within the pond. Conceptually, this scenario would entail creation of additional marsh characteristics near the two northern inlets. Primarily this would occur through intense planting and seeding efforts. Open water habitat may still be preferred near the reservoir outfall for aesthetic and water storage purposes; however, supplemental aquatic plantings would reduce the tendency toward seasonal algal blooms.*

Alternative#2 - Abatement of Upland Erosion and Sediment Transport - *Reducing the level of sediment and nutrients entering the Mill Pond is a necessary first step toward improving the aesthetic and biological state of the Mill Pond. Decreasing the sediment and nutrient load to the Mill Pond would reduce the potential to further exacerbate existing conditions. Controlling future upland erosion in the Mill Pond watershed may be challenging. The ultimate effectiveness of this approach, in reducing the biological state of the Mill Pond, is dependent on many factors including:*

- *The relative importance of runoff from roadways and lawns as nutrient sources in the Mill Pond watershed;*
- *The potential for internal nutrient cycling within the Mill Pond; and*
- *The level to which the plan can achieve a substantial reduction in sediment import to the pond.*

Alternative #3 - Abatement of Upland Erosion and Sediment Transport, and Phosphorus Inactivation.

This approach provides a greater level of assurance for successfully controlling the biological state of the Mill Pond if a larger area of open-water habitat is desired. By using all of the techniques mentioned in alternative #2, a reduction in sediment import may be obtained. Additionally, once upland erosion and sediment transport is controlled, treatment of the pond with aluminum sulfate could reduce the concentration of phosphorus in the water column and prevent its release from existing sediments. A supplemental dredging effort may provide a potential benefit if conducted after successful stabilization of upland areas is complete.

Alternative #4 - No Action

This is the least expensive of all possible options. The short-term result of non-action would be increases in algal blooms, aquatic weeds, and possibly foul odors. However, as Forest Heights approaches a built-out condition, the biological productivity occurring within the Mill Pond may taper off



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as sediment transport decreases. This approach would produce the smallest potential benefits and would not address the Association's concern regarding the visual attractiveness and biological integrity of the Mill Pond.

The PALSAs report stated that these alternatives or combined variations thereof, provided for a wide range in restoration cost options. The least expensive alternative might only require several thousand dollars to implement, while other alternative could rapidly exceed tens of thousands of dollars. Ideally the Association would select an approach that provides an acceptable level of aesthetic appeal and provides a long-term solution.

From my investigation the Association's Agent/ Developer never formally adopted any PALSA alternative(s). Shortly thereafter developer "Turnover" occurred in 2002 and the newly formed Forest Heights Homeowners Association (FHHOA, the current establishment) commenced on a "Reserve Study" and the development of a "Maintenance Plan" as required by state statutes. Management commissioned Mike Peebles from OTAK to review the maintenance plans for the stormwater facilities within the Forest Heights development to satisfy these requirements. Ironically during that same period of time, conceptual ideas were proposed for a joint development project combining the Village Center with a Community Center. Conceptual ideas and plan were prepared by Waterleaf Architects. The joint development project was presented to the Association (residents of FHHOA) for a community vote and subsequently failed by a narrow margin of 10 percent. The Association's governing documents require a 75% approval by all residents to move forward with the capital project.

OTAK's report from 2002 outlined the proposed maintenance and operations; plans for Mill Pond and the two water quality ponds, as well as infor-

mation on the impacts of the February 1996 flood events on the Forest Heights development, and the permit application from the previous dredging of the Mill Pond. Listed below are summaries and excerpts from the four OTAK attachments:

Attachment A - Forest Heights Drainage Master Plan

This excerpt from the Forest Heights Drainage Master Plan outlines the proposed Mill Pond water quality pond feature and outlines the proposed operation and maintenance schedule. Based on this document, "the facilities should be inspected every three to five years, which includes dewatering of facilities, inspection of all structures, removal of debris, and measurement of sediment accumulation."

Attachment B - Water Quality Features - Technical Information Report

This document is the technical information report for the two water quality features located upstream of the Mill Pond. The operation and maintenance section outlines the maintenance requirements for the facilities. The proposed schedule for inspections of the water quality facilities was initially four times a year, with the primary purpose being to assess the physical condition of each facility and determine if enough sediment and/or debris has accumulated to schedule maintenance clean up. Inspection and facility cleanout procedures are outlined in the operation and maintenance section. The maintenance responsibility for the two water quality facilities is now the responsibility of the City of Portland since the maintenance warranty period has expired (this was supposedly verified with Steve Fancher, City of Portland BES).

Attachment C - DSVCOE Joint Permit Application

This document is the joint permit application for the 1996 dredging of the Mill Pond. It outlines the application submittal and permit requirements for



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the dredging operation. Mill Pond was dredged and cleaned out in the fall of 1996 by Ken Leahy Construction, Inc. The contract amount of \$217,436 included removal of approximately 11,300 cubic yards of material and disposing off-site.

Attachment D - Forest Heights Storm Damage Assessment Report

This document is a report on the storm damage assessment at Forest Heights (dated 5/2/96). This report outlines the impacts of the 1996 winter storms on the Forest Heights development. Included in the storm damage assessment report are recommended stabilization measures and estimated costs for implementing these measures within the designated stream corridors labeled "D" and "E". The total estimated cost for damage repair was approximately \$443,000.

The storm-related damage to the Mill Pond was heavily impacted by the flow of water from a broken public water main on Skyline Boulevard. Over one million gallons of water washed through drainages D and E and deposited sediment in Mill Pond.

OTAK's Summary

"Based on the recommended operation and maintenance plans for the Mill Pond, as well as the known maintenance of the Mill Pond since its construction in 1989, it is recommended that annual maintenance inspections be performed on the facility to evaluate the condition of the pond and associated structures. Upon completion of the major site development construction within the Forest Heights basin, it is recommended the maintenance inspections be completed every three to five years. Based on the amount of construction since the previous dredging of the Mill Pond in 1996, it is estimated another dredging operation will be required within the next five to ten years to maintain capacity and effective-

ness of the pond. Assuming no major storm events impact the function of the pond (similar to the 1996 storm events), it is estimated that approximately 5,000 cubic yards will need to be removed from the pond at its next cleaning. The estimated cost for permitting and removal of the excess sediment is approximately \$100,000 (\$20/Cy)."

The report also stated that "Once the build-out of Forest Heights is completed, no dredging is anticipated for the Mill Pond unless impacted by major storm events. Constructions of the two water quality facilities upstream of the Mill Pond have provided additional protection of sediment reaching the Mill Pond. The maintenance of the two water quality facilities is the responsibility of the City of Portland. In addition, in-stream measures consisting of rock-gabion energy dissipaters were installed in the drainageways to control velocities in the drainageways and reduce sediment transport".

Estimates from this report were used to substantiate funding in the FHHA Reserve Study to dredge Mill Pond; however some aspects of the maintenance plan were overlooked. Recently OTAK provided FHHA with an "Instream Measures Map" delineating the location of these watershed measures for future maintenance as described by the plan.

In my next article I will elaborate on the chain of events from 2002 to today, and bring you up to date on the options being considered by the Association for the future restoration of Mill Pond.



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Article III
Mill Pond Chronology 1989 to 2009

Since November of last year we have been exploring the history of Mill Pond. In the December and January newsletters I reviewed several professional consultant reports on the management and maintenance scenarios of Mill Pond and the Forests Heights watershed. I ended last month's newsletter with the 2002 OTAK report. This article will review the Association's activities from 2004 and will conclude next month with my recommendation to the Board on how to proceed with the restoration plan for our landmark water feature.

To start, let's review our objective for Mill Pond:

To select a restoration approach that provides an acceptable level of aesthetic appeal and provides cost effective long-term solutions for the Forest Heights watershed.

The landscape of the Forest Heights community was in flux during the early years of 2000 thru 2004. Multiple phases of the Forest Heights master plan development were being completed and a association leadership evolving. In 2004 the Forest Heights Active Recreational Opportunities Committee (AROC) conducted a survey to measure the needs and desires of the community. From that survey it was determined that a land survey should be conducted to locate possible sites for the development of recreational facilities. The 2004 Portland State Recreation Plan (PSRP – land survey) stated that:

"Forest Height residents of all ages use the Mill Pond area extensively. The area is comprised of Mill Pond, a relatively flat open space the size of a football field and a newly ex-

panded playground. The pond is a major attraction, and is ringed by a paved walk, that connects the greater trail system."

The PSRA report further stated that Mill Pond and surrounding acreage has the greatest potential for significant recreational amenities because of its position as a dynamic gathering point for Forest Heights residents.

Earlier that same year in a letter from George Marshall (developer representative) to the FHHA Board, Mr. Marshall stated:

"The developer of Forest Heights, Nauru Phosphate Royalties Inc. spent an enormous amount of money in all of the project components (i.e. street furniture) in order to create an outstanding neighborhood with lasting qualities. Forest Heights is special and that one could reasonably expect that housing values would be maintained at worthy values. Every dollar that was invested in Forest Heights by Nauru was spent with the hope and expectation that the future stewards of the project would recognize those special elements that have created the very unique lifestyle for all residents to share.

Surely the community is worthy of keeping the standards of Forest Heights as lofty and as attractive as possible. Costs alone shouldn't be the driving force when everyone's home values are at stake relative to the long range reputation of Forest Heights. Forest Heights and those that have invested in the neighborhoods deserve to have their leaders protect the image of Forest Heights from deterioration. Indeed, the leaders ought to strive to maintain the high image that Forest Heights enjoys and, where possible, use their best judgments to improve on that image whenever possible".

Following in that vein the Association contracted with Jones and Stokes to prepare a Habitat Management Plan for the Common Open Spaces in Forest Heights. This plan would help focus habitat management for the proposed Master Plan,



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balancing natural habitat and the use of the development with residents. The report presented a generic set of habitat management prescriptions that will improve habitat quality within the Common Open Spaces of Forest Heights. The list of prescriptions was a menu that could be used to select projects, which will meet HOA goals and budget. Implementing these prescriptions is entirely voluntary and may involve none, some or all of the prescriptions described. Prescriptions selected by FHHA were compiled into a Final Management Plan with specific methods and cost estimates. There was no City, State or Federal obligation to prepare or implement the prescriptions described in the plan. The plan was intended to help the HOA select measures that improve the wonderful natural habitat of the Common Open Spaces.

In 2006 the Common Area Master Plan was completed. The Master Plan considered a full range of community needs and desires while preserving the open spaces. The plan includes a preferred design with critical elements, funding options, and implementation strategies.

The Executive Summary in the 2006 Master Plan stated:

“Of the issues affecting the residents’ ability to safely and conveniently use the natural areas, environmental degradation is primary among them. Close to 20 years of development and storm water runoff from new streets and rooftops has played a major role in stream bank erosion, storm water detention facility failure, trail failure and invasive plant establishment. The increased intensity of the flows in the streams that course through most of the common areas creates the erosion that ultimately ends up in Mill Pond and three other inline storm water detention facilities. The proximity of natural area amenities such as trails, native flora, wildlife habitat and ultimately Mill Pond Park to these stream channels dictates the root cause of the degradation be ad-

dressed first.

The Forest Heights Community has within its midst an irreplaceable and prized asset. The Common Areas throughout the community represent features rarely found in a community of this size. Every home in the community is within a short walk of natural open space and recreational opportunity. It is in these open spaces that the life and the breath of the community are found. In them we meet our neighbors, we promote healthy living, we provide educational opportunities, we learn about the ever present need to steward our environments to the betterment of the whole. The Forest Heights Common Areas Master Plan will serve as the guide to the long range planning, protection, maintenance and management of this exceptional resource”.

The following is paraphrased from the Master Plan Site Content:

There are numerous interlinking streams and waterways meandering throughout the Forest Heights common areas. By virtue of its location at the headwaters of the Tualatin River Watershed, “Forest Heights has the potential to beneficially affect aquatic habitat and water quality for miles downstream of the neighborhood”. The stream network is influenced by water runoff that occurs naturally via overland flow, with additional storm water inputs from impervious surfaces such as roads, driveways and roof tops. Forest Heights has several wetlands and ponds. The condition of these wetlands and ponds is affected by the condition of the stream network discussed above, which provides an important source of hydrology for the ponds and wetlands. Streams also contribute sediment inputs and create disturbed conditions that provide competitive advantages for non-native plants.

One of the Master Plan Projects was the restoration of Mill Pond and the stream zones. Estimated cost for pond dredging was \$20.00 per cubic yard



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and \$2.00 for emergent planting. (cost estimates dependent on quantity). Partnership opportunities exist with numerous agencies and organizations, such as the City of Portland, Oregon Department of Fish and Wildlife, Clean Water Services, etc.

Acting on the 2006 Master Plan the Board created a Task Force in July of 2007 to study and report on the future of Mill Pond. The stated purpose of the Task Force is to:

“Study and analyze the current and future usefulness of Mill Pond and the feasibility and practicality of keeping Mill Pond or draining it. The Task Force will explore as many scenarios and combinations of uses as it can document. These include, but are not limited to: draining the pond, creating a wetland, reclaiming land for other uses, planting native species, maintaining the pond, repairing or replacing the weir for water level control, incorporating the pond into recreational facility plans.”

At this time I have not been able to determine if a task force report was ever made to the Board.

That year the Park and Recreation Committee issued an RFP asking for professional assistance to evaluate the Mill Pond site for future development which might include a Community Center and Pool. Waterleaf Architecture was awarded the contract on the feasibility study.

Waterleaf reported the following regulatory highlights in their feasibility study:

Mill Pond Background

- *Due to the age of the facility, deemed as "waters of the State"*
- *Mill Pond is a private facility, not owned or maintained by City of Portland*
- *City of Portland regulates Mill Pond*

- *Defined as a "Storm Drainage Reserve Tract" in the Planned Unit Development of Forest Heights*
- *Mill Pond is part of the Tualatin Drainage Basin, one of the State's "at capacity" systems*
- *Mill Pond is **not** zoned in the Conservation (C) or Preservation (P) zone*
- *Several sanitary and storm water easements thread through the site.*

Impressions of Mill Pond (current facility)

- *High sedimentation compared to other detention system due to slow water movement*
- *Water temperature is high. Water either needs to flow quicker through facility or be significantly deeper*

Modifications to the current facility

- *Modifications to can be made to the Mill Pond as long if it's current storm water detention capacity is maintained*
- *If changes are made best if those improvements allow for improved water quality while reducing maintenance to system. A system more "free flowing" with an increase in wetlands would be viewed as positive.*
- *Potential exists for an educational component.*

The Board accepted the report from Waterleaf and postponed any action until new management was hired. Early in 2009 the Mill Pond aeration system failed; the Association re-built the submersible pump and two months later the pump failed again. The pump failure was due to the shallow water level in the pond. These types of aeration pumps need to be in four to six feet of water. The Association did research other aeration methods and finally concluded that a comprehensive plan to restore Mill Pond was in the best interest of the community.



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This is my final article on the Mill Pond Restoration Plan. In my previous articles, I reviewed all prior studies and research performed on Mill Pond and the numerous modification scenarios to restore Mill Pond and the Forest Heights watershed.

To review, our watershed collects storm water runoff from 600 acres of FHHOA forested and developed land and includes hundreds of acres outside our community boundaries. From paved surfaces, lawns, rooftops, and storm water drainage ways, the Forest Heights development (FHHOA) represents approximately 56% of the land surface draining into the pond. In 1989, as part of the master water quality plan for our development, Mill Pond Park was created by developer Nauru Phosphate to provide a recreation focal point for the Forest Heights community.

The first remediation work completed on Mill Pond was the dredging of the pond by Leahy Construction in 1996. Additional water quality facilities were designed and installed that same year to comply with BES standards. Since 1996 no additional remediation work has been performed on the pond; however, numerous watershed measurements have been installed with each phase of the Forest Heights development.

Today, Mill Pond and several watershed measurements have become dysfunctional due to age and deferred maintenance of the facilities. The following components of Mill Pond have failed or need immediate remediation:

- pond
- weir
- pond retention wall
- pond aerators
- shore zone landscaping

- upstream water quality facilities and appurtenances
- in stream measurements

Here are my recommendations to the Board:

I) Hire Otak Engineering Services

Otak will provide professional engineering assistance for the restoration plan of Mill Pond and the FHHOA watershed. Management will use professional consultants and the resources of the West Multnomah Soil & Water Conservation District (WMSWCD) in unison with Otak.

II) Dredge Mill Pond

Immediately move forward with the dredging of Mill Pond. This is the most cost effective option with limited planning, permitting, and upfront costs associated with the restoration of Mill Pond. Dredging will achieve our community objective “to restore the pond’s aesthetic features”.

(Note: Other restoration options, including conversion to a wetland, only increase the level of complexity and, according to professional statements, may double or triple restoration costs. Exploring other options will also delay completion of the project.)

The dredging plan would include sediment removal, weir restoration, shore zone abatement, pond aeration, and establishment of future maintenance requirements.

III) Develop a Comprehensive Upstream Watershed Plan

The master water quality facilities and measurements should be examined; responsible parties identified, maintenance plans established and work completed according to those plans (which include the maintenance of two upstream City of Portland Water Quality Facilities). In conjunction with the maintenance plan(s), WMSWCD recommends that FHHOA evaluate and prioritize environmental



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issues to enhance wildlife habitats.

The Board just approved recommendation #1 and Management is currently working with Otak to schedule a meeting with governing agencies to identify the permitting process. Once identified, Otak will prepare a restoration outline and completion timetable for this project. Cost estimates for all components of the dredging plan will be analyzed against the allocated reserve funds and reported to the Board. Additionally, a construction/project RFP (Request for Proposal) will be jointly created with Otak consultation.

To conclude, it is my belief that the majority of FHHOA residents want to see Mill Pond—the landmark feature of this community—restored and not changed. The recommendation I've presented here keeps our efforts efficient, is focused on controlling the restoration plan costs, and will restore our water quality to match the beauty of our community.

Stephen Herr
General Manager FHHOA