THE USE OF RAIN GARDENS AS A BEST MANAGEMENT PRACTICE TO ADDRESS RUNOFF AND NONPOINT SOURCE POLLUTION IN MUNICIPALITIES

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INTRODUCTION

This proposal examines the use of rain gardens as a best management practice (BMP) for addressing surface runoff at the municipal level. Rain gardens are an essential piece to any stormwater management strategy because of their feasibility of implementation, their power to reduce volume of runoff, and their ability to reduce pollution. They can be installed by anyone from the private resident in their front yard or on a much larger scale commercially. While this proposal explores the implementation of rain gardens, it should be noted that rain gardens are just one type of BMP that can be used in tandem with other BMP's such as permeable paving, green roofs, and retention basins to curtail nonpoint source pollution and runoff.

The first part of this paper discusses the problems we face today due to traditional development that has ignored stormwater mitigation techniques. It illustrates how the inner processes of a rain garden (absorption, filtration, and evapotranspiration) operate inside the rain garden to reduce run off and pollution. The second part of this paper advocates for the enactment of local ordinances to aid the Federal regulatory system in combating runoff or nonpoint source pollution.

The third part of the paper assesses how successful municipalities have been able to see their cities flourish economically, socially, and environmentally through incentivizing rain garden installations and other BMP constructions through enacting city ordinances. Finally, the paper looks to key policy issues that lawmakers will face in attempting to pass similar legislation and funding their

ordinance proposals. A model ordinance reflecting this analysis is attached at the end of this paper.

I. HOW RAIN GARDENS CAN REDUCE THE "HIDDEN TAX" ASSOCIATED WITH POLLUTION AND FLOODING

One of the significant problems associated with mismanaged stormwater is that rainfall and snowmelt will travel through many different impervious surfaces picking up pollutants along the way and carrying them into water bodies or the drinking water supply. This process is known as runoff and polluted runoff is known as nonpoint source pollution. Part of the reason runoff has become such an issue is because traditional development has allowed rainfall and snowmelt to flow unimpeded through local streets, driveways, and rooftops into the water treatment system without ever facing any obstacles. Because the runoff travels unimpeded it is able to garner energy as its volume, velocity, and pollution levels rise. This energy enables the water to drag along larger trash and debris such as plastic bags or cigarette butts. It also carries smaller pollutants such as insecticides, pesticides, solvents, motor oil and other automotive fluids that choke or disable aquatic life, poison local ecosystems, and pollutes the water supply.[1] In recent years the EPA has estimated that nationally 13 percent of rivers, 18 percent of lakes and 32 percent of wetland estuaries are made unsafe for swimming or fishing because of stormwater.[2]

Left unimpeded stormwater runoff is free to build up pollutants from various sources and amass volume quickly leading to the flooding of streams, riverbeds, and

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[1] Chlesea Shuss, *What is stormwater runoff and why should we care*? *Available at* http://www.crawfordconservation.com/documents/TribInsert_3apr2011.pdf

[2] *Testing the Waters: A Guide to Water Quality at Vacation Beaches*, *available at* http://www.nrdc.org/water/oceans/ttw/action-plan.asp

neighborhoods. Flooding is a symptom of misguided development that does not account for stormwater management. As construction of infrastructure continues more and more of the ground that the natural environment has been using to store water will be sacrificed. Hard impervious concrete, asphalt, mortared pavers, roof shingles are commonly used in infrastructure plans and replace permeable ground limiting the natural environment's ability to store and filter water through its permeable soil. [3] As a consequence, water that would have originally been retained where that ground once was will be redirected as runoff causing flooding of streams, riverbeds and the local sewer systems. The net result is a "hidden tax" that is placed on the taxpayer and municipality because they are charged with the costs associated with maintaining an over-burdened sewer system due to overflow and neighborhood flooding.

The hidden tax includes the costs incurred by businesses or private residences to repair flooding damages. "Flood damage is estimated by the EPA to cause the United States $6 billion annually not including damage from hurricanes Katrina, Rita, and Wilma." [4] This is especially true since developers continue to build houses near and within the flood plain.[5] The hidden tax increases with an influx of development that fails to account for runoff. These costs can be adequately mitigated through the implementation of rain gardens into municipal engineering

[3] Cuyahoga River Community Planning Org., The Watershed Book: A Citizen's Guide to Healthy Streams and Clean Water, 39, 2011
[4] EPA, Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure, 10, 2010, *available at* http://www.sustainablecitiesinstitute.org/topics/water-and-green-infrastructure/stormwater-management/green-infrastructure-case-studies-municipal-policies-for-managing-stormwater-with-green-infrastructure
[5] Id.

because they will restore the amount of permeable ground needed to reduce pollution and runoff volume that causes flooding.

One of the opportunities associated with the implementation of rain gardens is that rain gardens are intentionally designed to capture toxic pollutants and chemicals by filtering them through carefully chosen plants and soils. Several processes occur within the rain gardens that are beneficial for the removal of harmful waste. These processes are known as absorption, sedimentation, and evapotranspiration. [6]

Through the process of absorption the soil in the rain gardens removes forms of heavy metals and phosphorus from fertilizers reducing the burden on water treatment facilities. Soils such as wetland soils have a slight magnetic charge that attracts heavy metals, nitrogen, and phosphorous preventing them from entering the stormwater system.[7]

Through the process of sedimentation and filtration rain gardens remove litter and trash that could otherwise end up streams and rivers. As previously discussed, runoff from rainwater and snowmelt travels through the streets and neighborhoods at fast rates. Rain gardens act to remove this high energy from the run off by decelerating the flow of the water and catching any trash or litter the water may have been carrying. [8] Similarly, the energy of runoff will be reduced because of the use of permeable soils within the rain garden. The permeability of the soil allows the water to filter down into the rain garden as opposed to remaining

[6] William F. Hunt & Nancy White, NC St. Univ. et al, Urban Waterways: Designing Rain Gardens (Bio-Retention Areas), 3, 2001
[7] Id.
[8] Id.

above ground as run off, thus reducing the total volume and velocity of surface runoff.

The process of evapotranspiration comes from the plants in the garden that act as sponges absorbing rainfall and snowmelt so that it may be used for photosynthesis and entered safely back into the rain cycle as clean water. This will have a direct result in reducing runoff volume to suppress flooding from heavy rainfalls. The rain garden will catch the water and reflect it back into the water cycle reducing the amount of flooding caused by runoff. Additionally, the plants have an aesthetically pleasing value to them adding to property values while providing a natural habitat for birds animals and insects. [9] Engineers, private residents, or anyone seeking to install a rain garden may look to various studies for the selection of rain garden plants that are durable enough to assimilate pollutants such as zinc, lead petroleum hydrocarbons, and salt. [10]

II. WHY LOCAL ORDINANCES ARE NEEDED TO SUPPRESS NONPOINT SOURCE POLLUTION OR RUNOFF

Today nonpoint source pollution (or runoff) has surpassed point sources as the largest cause of water quality impairments.[11] Nonpoint source pollution comes from water that travels over land or water that flows over impervious surfaces, as opposed to point source pollution that stems from any single identifiable source of pollution from which pollutants are discharged such as factories and sewage

[9] Id. at 9.
[10] Daniel Shaw & Rusty Schmidt, Plants For Stormwater Design: Species Selection For the Upper Midwest, 17, Sam Brungardt, (2003)
[11] Envtl. Law Inst., Biodiversity Conservation Handbook: State, Local & Private Protection of Biological Diversity, Robert B. McKinstry, Jr et al., (2006)

treatment plants. [12] Huge steps have been taken at the Federal level to address pollution through the use of major federal statutes such as: the Clean Water Act (CWA); The Safe Water Drinking Act; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). [13] While the provisions of these acts attempt to provide guidance and incentivize pollution control through tax credits to the states, their provisions remain inconsistent and outdated because of a lack of integration in enforcement.

The above cited laws are carried out by various agencies including the US department of Agriculture, the US Army Corps of Engineers, the EPA, and the US Department of Interior. The EPA has recognized that the fragmentation of interagency cooperation has led to inconsistent policies, permits, and enforcement orders which has made it difficult for states to conform to standards in order to receive federal credit. [14] As a consequence, municipalities have been hesitant to rely on federal funding for their green infrastructure investments to address nonpoint pollution programs because of the vague compliance based standards in order to receive federal credit.[15]

> Municipalities are responsible for implementing and enforcing expensive Clean Water Act Requirements, while also trying to pay for a large number of other programs, both environmental and non-environmental. EPA estimated in 2004 Clean Watersheds Needs Survey that nationwide capital investments for controlling stormwater and wastewater pollution over a 20-year period will be 202.5 billion,

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[12] Id.
[13] Id. at 429
[14] EPA, *supra* note 4, at 8.
[15] The Johnson Foundation at Wingspread, Considering the Clean Water Act, 10, (2009).

> including 554.8 billion for combined sewer overflow corrections and $9 billion for stormwater management. [16]

Additionally, catalyzing environmental issues stemming from nonpoint source pollution have been allowed to plague municipalities and the states because of outdated provisions of federal regulations such as the Clean Water Act. For instance new chemicals and microbial pollutants, (or emerging contaminants), have been recently discovered in nonpoint source and point source pollution. However, these contaminants continue to go unregulated by the Clean Water Act despite their negative impact on health, safety, and natural environment. [17]

Local governments stand to gain by taking the initiative to enact ordinances that fill the gaps of existing federal laws to address nonpoint source pollution. With broader jurisdiction under its police powers the municipality remains as the most effective authority that can swiftly institute policy change and produce new funding avenues for rain garden installations that can counter the effects of nonpoint source pollution. In addition to combating nonpoint source pollution the benefit of implementing rain gardens will yield economic, environmental, and social benefits.

In enacting the proposed rain garden ordinance businesses and residents stand to gain economically through the reduction of costs associated with the damage of flooding of streets, backyards, and neighborhoods. Rain gardens strategically placed throughout the municipality retain much of the storm water that is flowing through the neighborhood as run off. Water from the street, rooftops, and parking lots, is directed into the rain gardens rather than having to be dealt with by

[16] EPA, *supra* note 4, at 9.
[17] Id.

the municipal sewer system. Basements of residents and businesses will sustain less damage from flooding. Municipalities will save costs incurred for maintenance and sewer repair because of a more efficiently run sewer system that isn't clogged by over flow during heavy rains or pollutants.

Businesses and residents also stand to gain environmentally because rain gardens act to remove pollutants from their streams, riverbeds, and drinking water. Rain gardens imitate the natural process of the water cycle to filter out pollutants and toxins through the process of absorption, filtration, and evapotranspiration. Because of these tools the rain gardens posses the ability to filter chemicals derived from fertilizers, oils and gasoline from cars, and trash and larger debris that plague the water supply and natural water bodies. A clear environmental benefit is derived from the rain gardens having to deal with filtering out these pollutants rather than water bodies or municipal utilities.

Finally, businesses and residents stand to gain socially through an ordinance that incentivizes the implementation of rain gardens because they create an attractive landscape. The aesthetic value associated with the plantings of native flora and fauna within the rain garden has a social benefit that doubles as an economic benefit because the implementation of a rain garden is likely to increase property value. Additionally, an increase in the quality of environment will lead to more residents walking and enjoying the outdoors. Ultimately, this will lead to more patronage of local businesses and attract an influx of new developers.

III. HOW SUCCESSFUL MUNICIPALITIES HAVE INCORPORATED RAIN GARDENS INTO THEIR ORDINANCES

Lancaster, Pennsylvania has enacted a stormwater ordinance that requires and incentivizes the use of rain gardens in most, if not all, of the city's new development plans. [18] Because of the expansiveness of the ordinance's applicability it will ultimately change the entire face of the city by involving rain gardens and other BMP installations in almost every blueprint for construction. It requires rain gardens to be incorporated into infrastructure by imposing fines on developers who do not comply with its stormwater management standards if they are acting under the broad net of "regulated activities". [19] Regulated activities are defined to include but are not limited to any: land disturbance; land development; subdivision; construction of parking lots; construction of new buildings or existing buildings. [20] The breadth of the applicability of the ordinance is notable because the more rain gardens that are installed the more capturing of runoff will take place.

Similarly expansive is its definition for BMPs:

> Activities, facilities, control measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this commonwealth before, during and after earth disturbance activities.[21]

The broad definition of BMP's permits the developer acting under the purview of one of the regulated activities to build rain gardens or choose from a broad spectrum of engineering that produces the same effect thus allowing for feasibility of compliance with the ordinances standards.

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[18] Lancaster, PA, Code § 260-103
[19] Id. at § 260-301(E)
[20] Id. at § 260-105
[21] Id. at § 260-202

By instituting a "site plan provision", Lancaster has provided the help of its own engineers to avoid serious loss on investment due to negligent or improper engineering of rain gardens. Before permit approval of any regulated activity, city officials review the developer's plan for the installation of the rain garden to determine adherence to the stormwater management standards set by the ordinance. [22] This is quintessential for prudent development because it minimizes project failure and inefficiency.

Installing a rain garden requires a degree of engineering sophistication in order to avoid project failure. For instance the use of wrong types of soils or unsuitable plants can lead to the flooding of the rain garden because the soil isn't permeable enough. Improper construction can lead to drowned plants because the selected plants aren't able to withstand water for a day or too. During the plan review process a city engineer would spot these issues before they come to fruition saving the developer the costs of funding a failed project. [23] Consonantly, further oversight and preemptive checks are placed in the ordinance by encouraging developers to voluntarily set a meeting with city staff and engineers to discuss the elements of their application including the construction plan for their rain garden.

The Lancaster ordinance acts to reform traditional development by denying permits and imposing fees on developers who continue to ignore installations of rain gardens into their blueprints for development. Penalty provisions in the ordinance impose fees on construction that sacrifices permeable ground for asphalt

[22] Id. at § 260-401.
[23] Id. at § 260-503

and parking lots. [24] Therefore, developers are incentivized to incorporate rain gardens into their construction plans because their implementation will reduce impervious surface while adding property value to their land because of the use of native flora and fauna rather that unsightly asphalt.

Developers are also required to meet minimum storm water mitigation standards such as catching the first inch of rainfall in their rain gardens. Not meeting the minimum storm water mitigation standard will lead to a permit denial under its enforcement provisions.[25] Successful rain garden designs should always catch the first inch of rainfall because if they are unable to meet that minimal standard then they are likely to cause more of a burden than a solution to the municipal run off problem. Instead of the runoff being held in the garden, the garden is likely to over flow during the average rainfall and revert the water back into the streets and sewers.

The proposed ordinance mimics the Lancaster ordinance by replicating the enforcement standards and penalties in order to hold developers accountable for the damage to the environment, economy, and community they inflict if they choose to continue develop without rain gardens in mind. This strategy places some of the hidden tax costs associated with improper storm water management on the developer who choses not to incorporate rain gardens into their construction. With the incorporation of green infrastructure including rain garden design, the municipality will save money because of a less burdened municipal water treatment

[24] Id. at § 260-702.
[25] Id.

utility. These funds will support municipal projects that bring the locality up to the regulatory standards set by federal laws such as the NPDES and Clean Water Act.

Other municipalities that do not have a similar rain garden and BMP ordinance will not reap the same benefits from the installation of rain garden designs and have to find other sources of funding to maintain their over burdened utilities. Standard sewer rates or taxes that many municipalities have, do not account for the costs incurred from non-metered customers such as: vacant lots; parking lots; and utility rights of ways that contribute to a large amount of impervious space. [26] It is this discrepancy between funding from typical sewer water tax rates and the actual liabilities incurred by the municipality to maintain its water treatment utilities that places a great strain on municipal funds.

Philadelphia has addressed this issue by creating the "Philadelphia, Water, Sewer, and Stormwater Rate Board" to create a stormwater billing system that accurately reflects the municipal cost of managing stormwater for each property. [27] As of two years ago, this new board has instituted a billing system that operates to place a fee on developers who choose not to use rain gardens or similar installations: 80% of the new stormwater fee is based on impervious surface area of a property and the remaining 20% of the fee on the property's gross area. [28] By evolving from a typical stormwater billing system that just accounts for potable water to one that accounts for impervious surface area, the taxpayer is held accountable for how much run off they produce due to not installing rain gardens

[26] EPA, *supra* note 4, at 50.
[27] Philadelphia, Pa, Code § 13-101(3)
[28] http://www.phila.gov/water/wu/stormwater/Pages/ResidentialSWBilling.aspx

and other BMP projects. In effect, the revised fee formula holds each property owner accountable for the strain they produce on the sewer system creating a more equitable fee structure.

Philadelphia has measured the effectiveness of its ordinance by calculating the savings accumulated from green development constructed in the wake of the enactment of its ordinance. To measure the savings the city uses a formula that calculates the savings associated with the volume of runoff that is retained by redeveloped impervious surface. [29] Two years after the inception of Philadelphia's stormwater ordinance two square miles of impervious surface has been redeveloped into rain gardens and other BMP constructions. Two square miles of impervious surface would have produced half a billion gallons of water runoff over two years and cost the city an estimated $340 million to store excess runoff in combined sewer overflow tanks (CSO). [30] The municipality is free to reap the $340 million in savings because the water is now being processed by BMP's such as rain gardens rather than Philadelphia CSOs.

IV. KEY POLICY ISSUES

Public support and education is necessary for a municipality to enact a fully integrated proposal that incorporates the use of rain gardens into municipal architecture. It can be difficult initially for municipalities to gain the publics support to pass the proposed rain garden ordinance because the public may have the misconception that these projects will cost more and produce little benefit. Therefore, it is important for municipalities to establish education programs in

[29] EPA, *supra* note 4, at 9.
[30] Id.

order to increase public awareness of the importance of rain gardens as a preliminary step before proposing a rain garden ordinance.

> It's a hard concept for the average customer to grasp—that stormwater needs to be managed. They see it as sort of a natural event and don't always relate to the various services that it takes to operate a stormwater utility. I think the key point is to be very clear with customers about what the revenue goes for and to be articulate about the services that you're delivering. [31]

Successful municipalities such as Lancaster and Philadelphia have used demonstration projects to provide education and garner public support for the enactment of new or revised stormwater policies that implement rain gardens. [32] Demonstration projects provide an easy and effective starting block to establish the legitimacy of intended policy changes. By illustrating the benefits and purpose of the rain garden projects through the use of signs that are placed next to installed rain gardens, the public can witness with their own eyes how rain gardens and other BMP's work in tandem to reduce stormwater run off. The signs produce an additional education benefit by being placed in all social spheres such as: businesses; municipal parks; and private residences. Each resident will see that rain gardens can be implemented at all levels of society. Similarly, it will define the nonpoint source pollution issue as one that doesn't have to be addressed solely by municipal agents but one that can be stifled through participation by private residents who choose to construct a rain garden in their own front yard.

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[31] Forester Media, *Stormwater Program Funding: Forming a Successful Stormwater Utility*, available at http://foresternetwork.com/free-reports/stormwater-solutions-funding-successfully-establishing-stormwater-management-utility (Fill out form to access the free report)

[32] EPA, *supra* note 4, at27.

Various methods of funding have been instituted by cities to fund municipal rain garden ordinances. A common trend has been to require a stormwater utility fee. Users within the stormwater management district pay the fee to directly support maintenance of existing storm drains system; development of drainage plans, flood control measure, administrative costs, and sometimes construction of major capital improvements. [33] The stormwater utility fee is extremely advantageous because it generates dedicated and stable funding to stormwater mitigation that cannot be diverted to other municipal programs. This is more effective than the typical route municipalities take which is to pull revenue from a general tax fund to deal with stormwater mitigation. General tax funds can at times be unstable and insufficient to accommodate for costs during stormy seasons that can surpass accessible revenue. [34]

Policymakers intending to impose a stormwater fee must also consider incentives in the form of penalties and credits in order to attract developers while dissuading harmful development. Penalties and incentives must be balanced in a way that includes reasonable stormwater fees with attractive incentives for developers who undertake green infrastructure on their own initiative. City officials who seek to attract more businesses may want to consider a more incentive based approach. Contrarily, a municipality that has flourishing economic development and strong public support for rain gardens, may want to consider a more stringent penalty and restrictions based approach.

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[33] Forester Media, *supra* note 28
[34] Id.

In considering what kind of incentives to write into their ordinances policy makers can offer tax credits to residents who construct rain gardens. The purpose of the credits would be to reduce the cost of stormwater fees based on how well the taxpayer has managed the stormwater from their property because of the rain garden. For instance a private resident who installs a rain garden that catches the first inch of rainfall on site may be credited a certain amount that will reduce the stormwater fee. [35] Although for many property owners this will produce little change in the fee, the owners of larger properties may see a great reduction or elimination of the stormwater fee so long as they have fulfilled a certain minimum goal set by the ordinance. Other incentive provisions that have been used by municipalities have been to provide grants or rebates, which are used by the taxpayer to defray the costs of upfront construction.[36]

V. **CONCLUSION**

Today the faces of American cities are changing. The change has been seen in cities such as Philadelphia and Lancaster that have incorporated rain gardens and rain garden design into their agenda for development. Rain gardens can be found where vacant polluted lots once were or lining businesses and private residences. The can be seen in action providing an aesthetically pleasing look while raising property values and increasing business profits. Flooding, erosion of streams, and pollution of their water supply will no longer be the elephant in the room because appropriate stormwater billing fees have been set to hold every developer accountable for their burden on the municipal utility. Whether motivated to meet

[35] Id.
[36] Id.

stricter federal regulations or by the social, economic, and environmental benefits these cities have begun to align progress with sustainable development that will aid future generations.

ATTACHMENT

[MUNICIPALITY], PENNSYLVANIA

ORDINANCE NO. [XXXXX]

RAIN GARDEN ORDINANCE

AN ORDINANCE OF [MUNICIPALITY], PENNSYLVANIA ESTABLISHING AN OFFICE OF THE LANDSCAPE ARCHITECT AND INITIATING A REIMBURSEMENT PLAN FOR QUALIFYING LAND OWNERS.

Whereas, stormwater runoff has impacted [municipality] by carrying pollutants and chemicals into streams and rivers creating an adverse effect on the environment and hindering sustainable development for future generations.

Whereas, the purpose of this ordinance is to promote the health, safety and welfare, within [Municipality], Pennsylvania by reducing stormwater run off through reimbursing qualifying landowners who choose to install rain gardens.

BE IT ENACTED AND ORDAINED by the Board of Supervisors of [municipality], Pennsylvania, and it is hereby enacted and ordained as follows:

SECTION 1. Definitions– As used in this ordinance, the following terms shall have the meaning indicated, unless a different meaning clearly appears from the context:

> "Land development": the improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:
>
> > (1) A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
> >
> > (2) The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing prospective occupants by means of or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features.[37]
>
> "Landowner" The legal or beneficial owner or owners of land, including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the

[37] Lancaster, PA, Code § 260-202

lease to exercise the rights of the landowner, or other person having a proprietary interest in land.[38]

"Landscape architect" A registered professional architect licensed by the Commonwealth familiar with the native vegetation and practices relating to the installation and maintenance of rain gardens selected by the environmental review committee.[39]

"Rain garden" A bowl or saucer shaped depression, filled with soil and native plant species, built for the purpose of filtering, absorbing and collecting stormwater runoff from hard surfaces. [40]

"Stormwater Runoff" Excess precipitation that flows into water bodies and local storm sewer systems due to the prevalence of hard surfaces, such as impervious concrete.[41]

SECTION 3. Applicability: The following is a list of developments for which this ordinance applies:

(1) Land development.

(2) Construction of new or additions to existing buildings.[42]

SECTION 4. Landscape architect: A landscape architect shall be appointed by the board of supervisors or hired pursuant to a contract approved by the board of supervisors to serve at the pleasure of the board or for the term of the contract. The landscape architect shall have the following powers: [43]

(1) Preliminarily inspect any site before approving the Initial Application.

(2) Reject, accept, or modify any Initial Application.

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[38] Id.

[39] The Board of Supervisors may by resolution establish an Environmental Review Committee to review and make recommendations to the board on applications or plans submitted to the township as they relate to this ordinance.

[40] Minneapolis Public Works Department, Rain Gardens, (2007) http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/convert_253666.pdf

[41] Sustainable Cities Institute, Rain Gardens (2014) http://www.sustainablecitiesinstitute.org/topics/water-and-green-infrastructure/urban-forestry/rain-gardens

[42] *supra*, note 1, at §260-105

[43] PSATS Model Ordinance "Animal Control Ordinance"

(3) Enforce the penalties prescribed in Section 12 or any violations of any rules provided in this ordinance

(4) Hire no more than [X] agents to aid in reviewing applications and enforcing the provisions pursuant to this ordinance.

(5) Create a [Municipality] rain garden online database for the collection and data pooling of all approved plans.

(6) Create forms necessary for the application process pursuant to these provisions.

SECTION 5. Application: A complete application shall be submitted for approval by the landscape architect. No development under Section 3 can proceed unless the developer has an approved rain garden plan for development. The initial application shall include, but is not limited to the following: [44]

(1) An estimated build time for the rain garden.

(2) A maintenance plan.

(3) A request for reimbursement.

(4) A signed inspection agreement pursuant to section 7.

(5) The appropriate fees and expenses for processing pursuant to section 8.

(6) A rain garden sufficient to catch the first [X inches] of rain fall from the applicants property

SECTION 6. Maintenance plan: The landscape architect shall create a maintenance plan for purposes of ensuring project efficiency and to deter project failures for rain gardens. The maintenance plan shall include, but is not limited to the following:

(1) A blue print for rain garden design and the plants to be used.

(2) A long-term maintenance schedule providing for the routine inspection of the vegetation and soil within the rain gardens.

(3) Routine maintenance checklists.

(4) Estimated maintenance costs for the rain gardens.

[44] Pittsburg, Pennsylvania, Municipal Code 922.04

SECTION 7. Inspection agreement: The landscape architect shall create a form dubbed "inspection agreement" to be included within the application. The purpose of the inspection agreement is to provide a right of way to the rain garden for the landscape architect to ensure the rain garden has met the minimal standards imposed by section 13. The landowner shall submit a signed inspection agreement along with the maintenance plan. The inspection agreement shall provide, but is not limited to the following:

(1) The landscape architect shall evaluate the rain garden within 1 (one) month after site construction and plantings are completed to ensure that the project has been installed properly. The landowner may be present during this evaluation to ensure that any unfinished areas or additions to the rain garden may be addressed directly to allow the landowner to fix and/or finish them in a timely manner. [45]

(2) The expectation provisions provided in Section 13.

(3) The landscape architect may evaluate the rain garden at least once every two months for inspection.

SECTION 8. Fees and expenses: The landscape architect shall impose a [x] fee not to exceed [x] for the processing of the initial application.

SECTION 9. Approved plan: The landscape architect must respond with an approval or denial of the initial application within one month of receiving the initial application or else the initial application shall be considered denied. The initial application shall not considered an "approved plan" until the Landowner has registered the accepted initial application on the [municipality] rain garden database and consented to the terms of the accepted initial application. A landowner may show sufficient consent.

(1) Sufficient consent may be shown by one of the following:

(a) Registering the accepted application on the [municipality] rain Garden Database within three weeks of acceptance.

(b) Filing a notice of approval with the landscape architect within three weeks of acceptance of an application.

SECTION 10. Appeal for denied plans: A landowner may file a form to show cause for the denial of the initial application. The landscape architect may respond with a denial of the appeal or modify the terms of the initial application. The landscape architect must respond with a denial or a modified initial application no later than

[45] NEMO Northland, Raingardens pg. 45, http://www.co.carver.mn.us/departments/LWS/docs/NEMO_BioRet_Packet1.pdf

one (1) month or else the application is considered denied. The landowner must respond within three weeks of receiving the modified initial application; if not, the application is considered denied.

SECTION 11. Reimbursement: Landowners whose applications are approved shall receive one of the following reimbursement options at the discretion of the landscape architect:

(1) Up to [X] of costs used construction of the rain garden including plants and construction of the dig sights.

(2) Up to [X] maintenance costs per year.

(3) A tax credit of [x] for [x] amount of rainfall recovered.

SECTION 12. Penalties: If the landscape architect finds that the landowner has violated the terms of the approved plan, the landowner may be subjected to the following at the discretion of the land architect:

(1) Revocation of any agreement to the terms of an approved plan

(2) A penalty of up to [$X].

SECTION 13. Standards for approved plans: Violations of any of the guidelines agreed to in the approved plan may subject the landowner to the penalties provided in Section 12:

(1) The approved plan shall be registered with the [municipality] rain garden database landscape architect.

(2) The landowner shall notify the Landscape Architect of the date of completion of the rain garden within a week of its completion. [46]

(3) The landowner shall maintain the rain garden in accordance with the terms of the approved plan for at least [X] years. [47]

(4) The landowner shall maintain the rain garden in accordance with the terms of the approved plan for the duration of however long the Landowner is receiving reimbursement under the terms of the approved plan. [48]

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[46] Id.

[47] Thurston County Rain Garden Incentive Program 2014, http://www.co.thurston.wa.us/stormwater/utility/docs/instructions-and-guidelines-for-thurston-county-rain-garden-incentive-program.pdf

[48] Id.

SECTION 14. Repeal: All ordinances or resolutions or parts of ordinance or resolutions shall be repealed insofar as they are inconsistent with this ordinance.

SECTION 15. Effective date: This ordinance shall become effective five days after its adoption.