



Infrastructure





Above: Stormwater management facility.

Green infrastructure is an integral component of sustainable communities primarily because it can help protect the environment and human health while providing other social and economic benefits.

A. Water Management Master Plan

With the intent of fully complying with Alexandria’s Eco-City Charter of sustainably managing water resources to meet regulatory and capacity needs, a Water Management Master Plan (WMMP) is required to be provided by the developer, which will coordinate water supply, stormwater management, and wastewater systems. The Plan will include systems to reduce potable water use by capturing and reusing rainwater, reducing wastewater generation through water conservation, implementing low impact development (LID) and green infrastructure techniques for managing stormwater, and exploring reuse of greywater. These, in turn, will serve to reduce development impact on the storm and sewer infrastructure, and improve the instream habitat and water quality of Four Mile Run, the Potomac River, and the Chesapeake Bay.

B. Stormwater Management

Redevelopment presents an opportunity to coordinate stormwater management on individual blocks, in new public roads and rights-of-way, and throughout North Potomac Yard that integrates within the development framework. To accomplish the innovative stormwater goals envisioned as part of the Plan, the WMMP will incorporate specific stormwater management requirements. Both smaller on-site systems and larger facilities serving multiple blocks will be required to be integrated as part of the WMMP. The innovative techniques specified will provide enhanced stormwater performance measures that exceed water quality requirements current at the time of development. Individual blocks, for example, should incorporate elements such as vegetated green roofs, rainwater harvesting, pervious pavement systems, urban bio-retention, and tree wells that integrate into the infrastructure. The technologies help to reduce the amount of stormwater runoff generated, treat stormwater runoff, create ecological habitat, provide cleaner air and other public health benefits, and reuse the remaining stormwater to the greatest extent possible. The harvested rainwater will provide irrigation to adjacent vegetated areas such as on-site landscaping and tree wells located in the public right of way.

The WMMP may allow for the possibility of locating limited stormwater management infrastructure in the public realm including new public roadways consistent with City requirements. Green infrastructure techniques such as urban bio-retention, infiltration planters, vegetated swales, native tree planting, cisterns, vegetated green roofs, and pervious surfaces (including but not limited to native plant materials, permeable paving, porous concrete, sidewalk planters, and other techniques) provide the opportunity to remove pollutants in stormwater runoff, reduce the volume of runoff, help clean the air, reduce energy costs, promote public health, and provide other community amenities.

The installation of green infrastructure that requires infiltration will require special consideration due to low-level soil and groundwater contamination remaining from Potomac Yard's previous use as a railyard. Larger stormwater facilities, such as the stormwater management pond planned for Crescent Park, will be required to be designed to provide a high level of nutrient removal as well as function as a high-quality recreational amenity for residents and visitors and be integrated into the overall design of this urban park.



LID tree wells.



Since North Potomac Yard is uniquely located at the confluence of Four Mile Run and the Potomac River, the redevelopment is required to support the guidelines outlined in the Four Mile Run Restoration Master Plan while further enhancing protection of the adjacent Resource Protection Areas (RPA). This proposal will reclaim portions of the RPA to improve riparian character and ecological functionality.

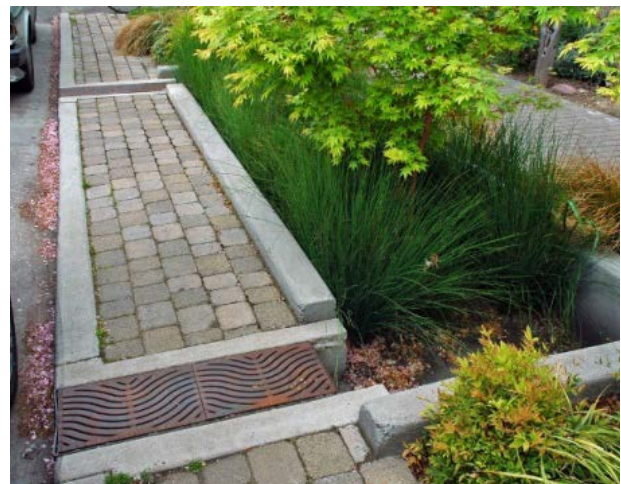
C. Wastewater Management

North Potomac Yard will have a significant impact on the City of Alexandria's sanitary sewer collection system and Alexandria Renew Enterprises' (AlexRenew) sewer collection and wastewater treatment systems. As a condition of approval of the Potomac Yard/Potomac Greens CDD zoning for CDD#10, a sanitary sewer interceptor was built from the Potomac Yard development directly to the AlexRenew Advanced Wastewater Treatment (AWT) facility. This Potomac Yard Trunk Sewer (PYTS) was required because the existing sewer system (both City and AlexRenew) did not have sufficient capacity to carry the sanitary flows from development proposed within CDD#10. The PYTS was designed to include additional capacity (beyond the anticipated requirement of CDD#10 at that time) to meet future needs of the City including the diversion of wet weather flows from the AlexRenew Four Mile Run Pump Station, separation of a portion of the City's combined sewer system (CSS) flows in the Old Town area, and limited development along the Route 1 corridor.

In the Potomac Yard/Potomac Greens CDD, it was anticipated that the redevelopment of North Potomac Yard would contain up to 600,000 square feet of development. The Plan recommends increasing the permitted amount of development from 600,000 square feet to 7.5 million square feet. The sanitary flows generated from this level of development slightly exceed the remaining unallocated capacity in the PYTS, including what had originally been designed to accommodate future City needs, i.e., separated sanitary flows from CSS area and other future developments.

Based on preliminary analysis, the City's flow estimates indicate that an assignment of the available capacity will likely lead to a surcharged (i.e. an over capacity) condition within the PYTS, with the potential to cause back-ups and sanitary sewer overflows into the

environment. The City has evaluated several options for accommodating the additional flows anticipated from North Potomac Yard, which includes the use of low flow plumbing fixtures and practicing water conservation measures to reduce the generation of the municipal wastewater, construction of a separate, parallel sanitary trunk sewer, and possible reuse of greywater. The use of low-flow fixtures and water conservation practices are recommended by the City's Eco-City Charter. With these water conservation measures, additional conveyance capacity will still be needed to convey the flows from the area to the treatment plant. The applicant will contribute funding toward the required improvements to the infrastructure to provide the necessary conveyance for the 7.5 million square feet in proposed development. In addition to the limited conveyance capacity, the City is evaluating capacity needs at the AlexRenew wastewater treatment facility. Based on the most current development projections, sufficient treatment capacity should be available for this development.



Stormwater management BMP.



Stormwater management integrated in street design.

D. Solid Waste Management

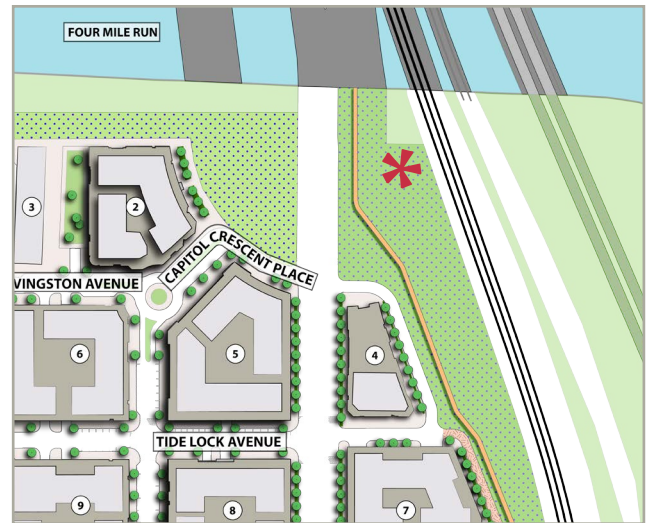
In compliance with the City’s Eco-City Charter, the developer will prepare a solid waste management plan for handling and disposal of solid wastes in an environmentally sustainable manner, which will include a hierarchy of uses: Reduce, Reuse, Recycle Resource Recovery, and Proper Disposal. The Plan shall develop a program to recycle the construction and demolition debris and materials that can be converted into valuable resources that would otherwise become waste.

E. Pump Station

A pump station will need to be constructed to accommodate the planned development within North Potomac Yard to pump sanitary sewage from the Plan area to the PYTS. The Plan recommends the pump station be generally located at the northern portion of Plan area as generally depicted in Figure 7.1, either adjacent to or integrated into Potomac Yard Park. The Plan recommends the pump station be designed in a manner that is integrated and compatible with the design and programmed uses of the adjoining Potomac Yard Park, and the facility be designed with high-quality materials compatible with the design of the adjoining Potomac Yard Park. The facility shall be located as close to the existing rail corridor, if feasible, to minimize impacts to Potomac Yard Park.

The design of the facility will require coordination with the City and AlexRenew. The pump station will need to be designed and constructed in accordance with AlexRenew’s guidelines and requirements and ensure sufficient pumping capacity to serve the entire Plan area. Design of the pump station will be conducted as part of the Phase I development special use permit and design of Potomac Yard Park.

Figure 7.1: Pump Station General Location



Depicts the general location for future pump station. Final location to be determined during DSUP and Potomac Yard Park design.



Images depict types of potential pump station facility designs. Left: existing facility located in South Potomac Yard. Right: integrated facility concept.



Figure 7.2: Existing Terminal Station to be Removed

F. Dominion Virginia Power (DVP) Proposed 230-KV Transmission Line

Dominion Virginia Power's project will add and upgrade equipment at the existing switching station on E. Abingdon Drive in Alexandria, and connect to the Glebe Substation on S. Glebe Road in Arlington. DVP's 230-KV Transmission Line could be located underground within the northern portion of the Plan area and potentially under a segment of Potomac Yard Park, Four Mile Run Park, and the future Crescent Park. As part of DVP's project, the existing terminal station along the southern bank of Four Mile Run will be removed, consistent with the Four Mile Run Master Plan. The Plan recommends that the final alignment of the transmission line minimize impacts to the planned open space and programming and improvements within North Potomac Yard and Four Mile Run.

Infrastructure Recommendations

Stormwater Management

- 7.1** A Water Management Master Plan (WMMP) is required as part of the CDD requirements. The WMMP will be updated/amended with each building and/or block to demonstrate compliance with each applicable phase.
- 7.2** Require use of pervious surfaces on sidewalks, driveways, parking areas, and streets to reduce generation of stormwater runoff, and provide green infrastructure practices to reduce stormwater pollution.
- 7.3** Maximize use of rooftop space for other sustainability practices (for example, for open space, community gardens, green roofs, energy generation, etc).
- 7.4** Maximize on-site stormwater reduction and reuse techniques to reduce the impact on public stormwater infrastructure.
- 7.5** Remove impervious surfaces within RPAs and revegetate to restore function and quality.
- 7.6** Maximize exposure of stormwater management facilities as functional amenities to promote citizen awareness and understanding of stormwater quality issues, while providing community co-benefits through the use of green infrastructure.
- 7.7** Construct additional sanitary sewer conveyance infrastructure and address Potomac River and Chesapeake Bay nutrient treatment needs.
- 7.8** Use harvested rainwater to meet irrigation demand.
- 7.9** Research and evaluate other pioneering technologies to address the capacity needs.

Wastewater Management

- 7.10** Use water conservation measures to reduce the generation of municipal wastewater and explore reuse of greywater.

Solid Waste Management

- 7.11** Develop and launch an education program that will include a hierarchy of uses: Reduce, Reuse, Recycle, and Proper Disposal of hazardous wastes.
- 7.12** Develop a recycling program for commercial and multi-family buildings.
- 7.13** Develop a community recycling program.

Pump Station

- 7.14** The facility shall be located on the northeastern portion of the Plan area as generally depicted in Figure 7.1.
- 7.15** The pump station will be designed with high quality materials and in a manner that ensures integration and compatibility with the design and programmed uses of the adjoining Potomac Yard Park. The facility should be located as close to the existing rail corridor as feasible to minimize impacts to the Potomac Yard Park. The design of the facility will require coordination between the City, developer, and AlexRenew and conducted as part of the Phase I development special use permit and design of Potomac Yard Park.

Dominion Virginia Power Proposed 230-KV Transmission Line

- 7.16** Any future power transmission lines should be undergrounded by DVP and located in a manner to minimize the planned improvements within North Potomac Yard and Four Mile Run. As part of the construction of any additional transmission lines, the existing terminal station within Four Mile Run (Figure 7.2), should be removed by DVP.