6. Stormwater Collection Treatment and Recharge

6.1. Existing Conditions

Most of the project area, that is, Areas B through F, is undeveloped and thus does not contain any impervious surfaces that would generate runoff. Runoff from precipitation in these study areas is contained on site – and ultimately within the water table – via filtration through the project area's well-drained, pervious soils. The exception is that, during severe storms, some of the precipitation may travel over land via sheet flow to intermittent streams and swales. Because Areas B through F are undeveloped, they contain no drainage infrastructure.

Area A, by contrast, is partially developed and contains approximately 6.29 acres of impervious surfaces, i.e., buildings and paved areas, and 4.34 acres of semi-pervious unpaved lots. Runoff from the unpaved lots is significantly less than that for impervious surfaces but greater than that for natural areas. Storm water runoff generated from the paved parking/access areas travels as sheet flow and is discharged into drywells located in the parking lot. Drainage infrastructure is also evident along the roadway that runs along the southern boundary of Area A. A determination of the sufficiency of the drainage infrastructure for Area A is beyond the scope of this study. However, based on field reconnaissance, it is apparent that a portion of runoff from Area A is directed off site via a drainage swale (See Figure 6-1) at the southeastern edge of the property, but does not reach the Carmans River as surface flow. This existing runoff to off site would be eliminated if the site is developed with all drainage required to be retained onsite.

6.2. Potential Impacts of Proposed Project

The proposed project would increase the amounts of impervious surfaces in Areas A through F which, in turn, would generate runoff during precipitation events. (The land cover discussion in Section 7.2.1 provides the acreages of impervious and pervious surfaces, i.e., natural and other vegetated areas, for the proposed project.) However, each study area will be required – per the Town of Brookhaven code – to store a maximum of eight inches of precipitation on site. An eight-inch precipitation event is a relatively rare occurrence. Thus, the project site and its surrounding areas and roadways would be protected from runoff during both nominal and extreme precipitation events. Table 6-1 provides a summary of the volume of runoff that must

be stored on site and the approximate acreage of the drainage reserve areas, or DRAs, that would be constructed to contain the runoff for the respective Areas.

Table 6-1: Runoff Volumes and Drainage Reserve Areas for an 8-inch precipitation event

Area	A	B	C	D	E	F
Storage Volume (cubic feet)	576,800	1,899,000	282,400	2,322,000	435,600	304,600
Drainage Reserve Area (Acres)[1]	1.33	3.69	0.86	4.41	1.07	0.81

Note 1: Industrial lots within Area A will retain site runoff in dry wells and/or DRAs.

The required Drainage Reserve Areas can be accommodated within the boundaries of Areas A through D. In Area A, there would be cleared areas between the parking lots and the stadium that can easily fit a 1.33-acre DRA. In Area B, there are numerous landscaped areas – adjacent to parking areas and rights-of-way – that can support a sufficient number of rain gardens to retain the runoff. Alternatively, there are sufficient open areas both within the residential development or around its immediate periphery to install the 3.69 acres of drainage reserve areas. The relatively small, 0.86-acre DRA in Area C can be easily located adjacent to the parking area, without impacting the area required for the playing fields. Area D, an industrial subdivision, requires approximately 4.41 acres of total drainage reserve areas. In this instance, the required drainage reserve area for the roads would be accommodated within one DRA that is set aside at the southern end of the study area. Individual industrial lots would retain runoff on site through dry wells and/or DRAs as required depending upon the site design constraints and considerations.

6.3. Mitigation

It is anticipated that the proposed drainage design would be based on a desire to improve the quality of storm water through natural, aesthetically pleasing on-site treatments and to maximize on-site recharge in accordance with Town of Brookhaven standards. The proposed storm water collection and treatment design would be based on an eight (8) inch rainfall event (in excess of a 100-year storm event). After grading, all runoff would be collected and recharged on site. No water would be discharged from the site.

Storm water for the impervious surfaces would be collected in catch basins and flow via pipe into recharge basins and/or dry wells. Natural areas would be conveyed to the recharge basins and/or drywells via overland flow.

Storm water from the building roofs would be relatively free of contaminants. It is anticipated that some of the other surfaces would utilize semi-pervious materials to allow recharge of relatively clean water.

The stormwater system would be maintained in accordance with best management practices including periodic cleaning of catch basins.

The stormwater recharge basins would be planted with a riparian seed mix such as that shown in Table 6-2. This seed mix includes several native grasses, sedges, and rushes (Indian Grass, Fowl Mannagrass, Fox Sedge, Soft Rush) that will colonize the slope. The extensive root systems of these plants will not only stabilize the soils of the basin, but will provide oxygen and substrate for the soil bacteria that will treat runoff. The variety of native herbaceous plants will provide wildlife habitat and an attractive flowering edge. Several native shrubs are also represented in the seed mix, including Silky Dogwood (a good slope stabilizer), Witch Hazel, Arow Wood, and Elderberry.

The pollutants that may be released from the paved surfaces would be derived exclusively from automotive residuals. Ordinary soil bacteria readily degrade most petroleum compounds that reach the ground. Trace metals are usually bound up in the organic material of the soil. Consequently, very little if any stormwater contaminants would be expected to reach the groundwater. The potential impact of stormwater on the groundwater is therefore expected to be minimal.

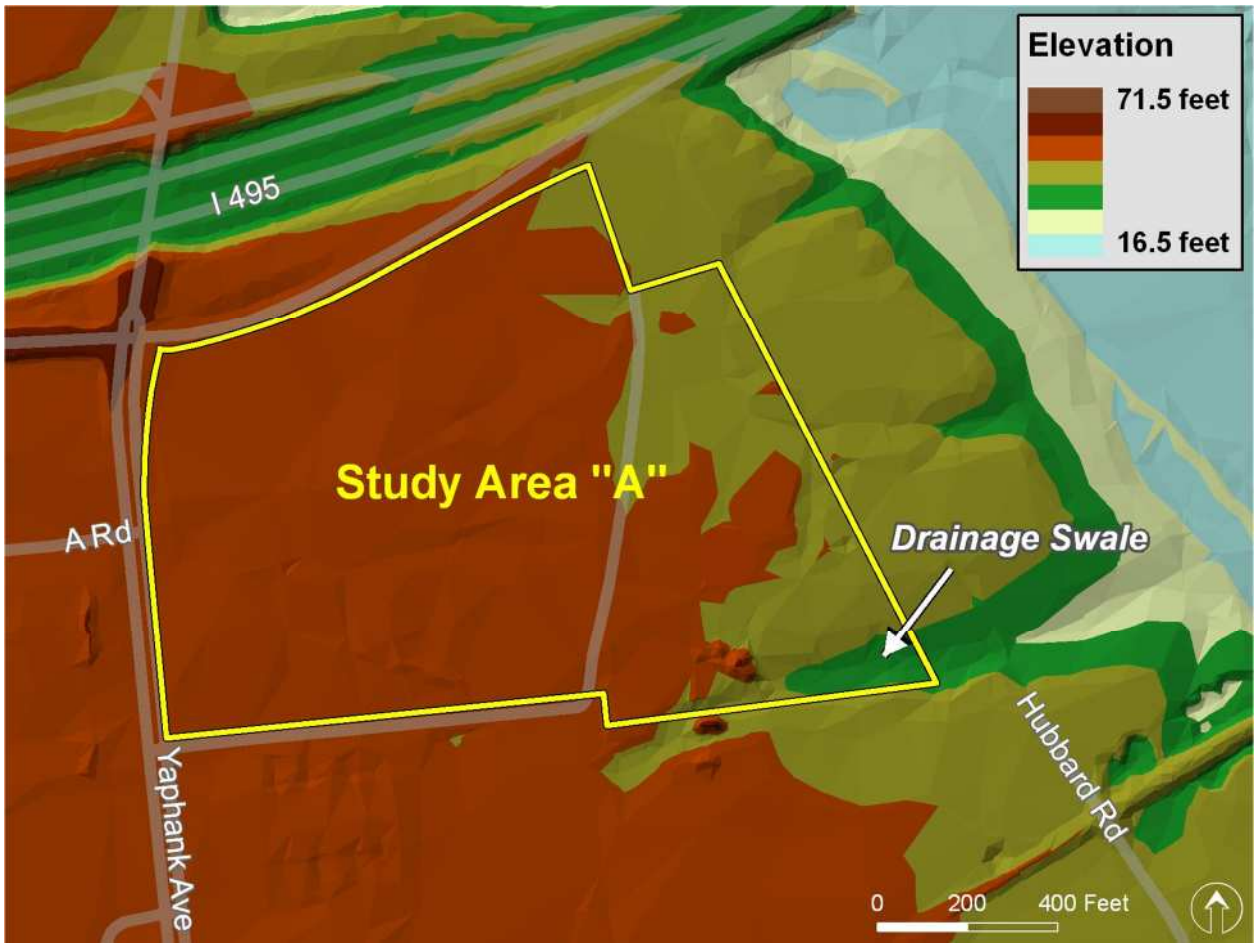
Runoff from non-vehicle areas such as roofs, walkways and terraces would be relatively clean, as there would be no release of contaminants and little salt de-icing. Runoff from lawn areas could carry fertilizer and pesticide. Time release or organic fertilizers would be used that are retained in the sod longer than conventional fertilizers. They are less likely to be washed into the subsoil and ultimately the groundwater before being absorbed by the vegetation.

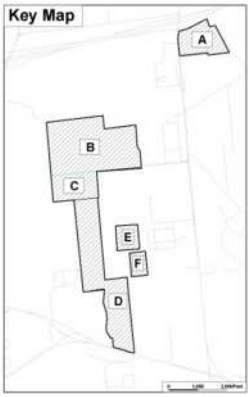
Table 6-2: Seed Mix

Riparian Buffer Mix ERNMX-178

%	Botanical Name	Common Name
7.00%	*Panicum virgatum*	Switch Grass, Shelter
6.00%	*Elymus riparius*	Riverbank Wild Rye
6.00%	*Elymus virginicus*	Virginia Wild Rye
6.00%	*Setaria italic*	German Foxtail Millet
5.00%	*Andropogon gerardii*	Big Bluestem, Niagara
5.00%	*Andropogon scoparius*	Little Bluestem
5.00%	*Lolium multiflorum*	Annual Ryegrass
4.00%	*Cornus amomum*	Silky Dogwood
4.00%	*Rudbeckia hirta*	Black Eyed Susan
4.00%	*Sorghastrum nutans*	Indian Grass
4.00%	*Verbena hastate*	Blue Vervain
3.50%	*Heliopsis helianthoides*	Ox Eye Sunflower
3.00%	*Chamaecrista fasciculate*	Partridge Pea
3.00%	*Glyceria striata*	Fowl Mannagrass
3.00%	*Hamamelis virginiana*	Witch Hazel
3.00%	*Rhus typhina*	Staghorn Sumac
3.00%	*Vernonia gigantean*	Giant Ironweed
3.00%	*Viburnum dentatum*	Arrow Wood
2.50%	*Helenium autumnale*	Common Sneezeweed
2.00%	*Asclepias syriaca*	Common Milkweed
2.00%	*Carex vulpinoidea*	Fox Sedge
2.00%	*Desmodium canadense*	Showy Tick Trefoil
2.00%	*Eupatorium fistulosum*	Joe Pye Weed
2.00%	*Juncus effuses*	Soft Rush
2.00%	*Penstemon digitalis*	Tall White Beard Tongue
2.00%	*Sambucus Canadensis*	Elderberry
1.50%	*Eupatorium perfoliatum*	Boneset
1.00%	*Asclepias incarnate*	Swamp Milkweed
1.00%	*Aster prenanthoides*	Zigzag Aster
1.00%	*Baptisia australis*	Blue False Indigo
1.00%.	*Monarda fistulosa*	Wild Bergamot
0.50%	*Euthamia graminifolia*	Grass Leaved Goldenrod

Seeding Rate: 15 lb per acre, or 1/3-1/2 lb per 1,000 sq ft





Area A Topography and Drainage Swale Location
Figure 6-1