
To:	Woburn City Council	From:	George Ryan, P.E. Andrew Allain
	City of Woburn		Stantec
File:	The Vale Master Plan	Date:	September 1, 2021

Reference: The Vale Master Plan – Stormwater Management MemoIntroduction

The Vale Master Plan is a mixed used project located on the former Kraft Atlantic Gelatin Facility at the end of Hill Street in Woburn MA. The hydrologic analysis and limit of work includes 62.4 acres of the site bounded by the property line on the North, South and Eastern sides. Stormwater runoff from the project site travels across the site before converging at the ultimate design point downstream of the project site, the Aberjona River. Four interim design points on the project site have also been analyzed: an on-site isolated wetland, the convergence of the Aberjona River and the Sweetwater Brook, the Aberjona River (on-site), and an off-site wetland located in Winchester to the south-east of the project site all of which are tributary to a point in the Aberjona River downstream from the project site.

In the existing condition, the project site is partially developed with the Kraft Atlantic Gelatin Facility buildings and associated parking. In order to mitigate potential impacts to resource areas, stormwater management systems are proposed and have been designed in accordance with the City of Woburn's Stormwater Management Plan and the Massachusetts Department of Environmental Protection's *Stormwater Management Standards*.

The project has been issued an order of conditions (DEP#348-0813) and undergone peer review. Due to programmatic changes, the building layout within the commercial area of the Vale commercial area has been revised to reflect current market conditions. The following memo summarizes continued compliance with the stormwater management regulations incorporating the final approved design of the residential projects.

Stormwater Standards**Standard 1 – Untreated Discharge**

Standard 1 states that “no new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.”

New stormwater outfalls are proposed to accommodate the proposed development. All runoff directed to these stormwater outfalls will be treated prior to discharging by a series of deep sump hooded catch basins, water quality units, and surface/subsurface infiltration systems. Each new outfall will be constructed with rip-rap energy dissipation aprons to control exiting velocities and prevent erosion to existing design points. Sizing calculations for the rip-rap energy dissipation aprons for the commercial development have been provided and reviewed with Stormwater Management Report.

Therefore, the Project will comply with Standard 1.

Standard 2 – Peak Rate Attenuation

Standard 2 states that “stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.” The proposed stormwater management systems are designed to attenuate the 2-, 10-, 50- and 100-year 24-hour storm events. In doing

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so, the post-development peak discharge rates do not exceed the pre-development peak discharge rates for the entirety of the site. A summary table of peak flow rates is included below for reference:

Design Point		2-Year Storm (3.30")	10-Year Storm (5.20")	50-Year Storm (7.46")	100-Year Storm (8.94")
DP1	Existing Rate (cfs)	3.25	7.57	13.90	17.91
	Proposed Rate (cfs)*	0	0	0	0
DP2	Existing Rate (cfs)	36.97	62.79	96.71	117.19
	Proposed Rate (cfs)	31.04	62.04	96.42	112.86
DP3	Existing Rate (cfs)	16.73	45.05	89.71	118.49
	Proposed Rate (cfs)	16.22	35.06	70.26	106.52
DP4	Existing Rate (cfs)	0.01	0.31	2.67	5.18
	Proposed Rate (cfs)	0.01	0.26	1.68	2.98
DP5	Existing Rate (cfs)	47.84	96.86	166.92	213.59
	Proposed Rate (cfs)	47.26	96.30	160.26	211.27

*DP1 will be removed in the proposed condition

Therefore, the Project will comply with Standard 2.

Standard 3 - Recharge

Standard 3 states that the “loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.”

The project site will provide recharge volume with eight infiltration systems.

Required and Provided Recharge Volume

Required Recharge Volume		Provided Recharge Volume	
HSG A 0.60 in/sf imp.	Δ 191,574 sf	INFC1	11,232 cf
	9,579 cf	INFC2	2,730 cf
HSG B 0.35 in/sf imp.	Δ 0 sf	INFC3	4,875 cf
	0 cf	INFC4	2,438 cf
HSG C 0.25 in/sf imp.	Δ -12,793 sf	INFC5	2,015 cf
	-267 cf	TH POND 1	3,195 cf
HSG D 0.10 in/sf imp.	Δ 308,306 sf	MF POND 1	1,920 cf
	2,569 cf	MF POND 2	374 cf
Total	Δ 487,087 sf	Total	28,779 cf
	11,881 cf		

Standard 4 – Water Quality

Standard 4 states that “Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids.”

Standard 4 is met when a project complies with all of the following criteria:

1. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained.
2. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
3. Pre-treatment is provided in accordance with the Massachusetts Stormwater Handbook

The project will include a total of 1,311,453 sf of impervious area. Roof area will account for 567,277 sf and Site impervious area will account for the remaining 744,176 sf.

Provided Water Quality Volume

Treatment Train	TSS Removal %	Contributing Impervious Area (sf)
#1	85	203,461
#2	97	101,514
#3	99	77,211
#4	80	329,260
No Treatment	0	32,730
Total		744,176
Weighted TSS Removal %		82.14%

The Project will provide a minimum of 80% TSS removal through deep sump hooded catch basins, water quality units, infiltration systems, biofiltration systems.

In an effort to acknowledge a pending TMDL report for the Aberjona River, the project has taken extra steps to reduce total phosphorus loading. Through the use of structural water quality devices designed to target phosphorous and infiltration practices where feasible the project will achieve a reduction in phosphorous of 50%.

The project will provide both 80% Total Suspended Solids (TSS) and 50% Total Phosphorus (TP) removal, therefore the project complies with Standard 4.

Standard 5 – Land Uses with Higher Potential Pollutant Loads (LUHPPL)

Standard 5 states that “for land uses with higher potential pollutant loads [LUHPPL], source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.”

The commercial portion of the Project exceeds the 1,000 vehicle trips per day threshold and therefore is considered a LUHPPL.

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As a LUHPPL, the commercial portion of the site is required to:

- Achieve 44% TSS removal prior to discharging to an infiltration basin
- Use a water quality depth of 1-inch when calculating the required water quality volume.

Both requirements of a LUHPPL are met for all commercial infiltration systems and water quality units. Therefore, the Project complies with Standard 5.

Standard 6 – Critical Areas

Standard 6 states that “Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.”

Critical areas include any one of the following, as defined by the Massachusetts Department of Environmental Protection:

- Outstanding Resource Waters
- Special Resource Waters
- Zone I Recharge Areas
- Zone II Recharge Areas
- Interim Wellhead Protection Areas
- Zone A Recharge Areas
- Bathing Beaches
- Cold-water Fisheries
- Shellfish Growing Areas

The proposed stormwater management system does not discharge near or to any of the above listed critical areas.

Therefore, the Project complies with Standard 6.

Standard 7 – Redevelopment Projects

Standard 7 states that “a redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.”

The project is considered a mix of new development and redevelopment. As proposed, the project fully complies with the new development requirements of Standards 2, 3, 4, 5, and 6.

Therefore, the Project complies with Standard 7.

Standard 8 – Erosion and Sediment Control Plan

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Standard 8 states that “a plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.”

Sedimentation and erosion controls will be implemented during the construction of all phases of the Project. Land disturbance will be evaluated on a parcel by parcel basis and a Stormwater Pollution Prevention Plan (SWPPP) will be prepared for each parcel that involves a land disturbance greater than one acre.

Therefore, the Project will comply with Standard 8.

Standard 9 – Operation and Maintenance Plan

Standard 9 states that “a long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.”

An operation and maintenance plan for all Stormwater BMP's has been provided as part of the Stormwater Management Report submitted to the Conservation Commission.

Therefore the Project complies with Standard 9.

Standard 10

Standard 10 states that “all illicit discharges to the stormwater management system are prohibited.”

The Project will not allow illicit discharges to the stormwater management system. The final design will comply with the below Illicit Discharge Compliance Statement:

Illicit Discharge Compliance Statement

Per the requirements of Standard 10 of the Massachusetts Stormwater Management Standards, it shall be stated that no illicit discharges are proposed as part of the Vale project located in Woburn, Massachusetts, as described herein this stormwater report.

Therefore, the Project complies with Standard 10.

Due to their length, Stormwater management calculations have been omitted from this memo and are available in electronic of paper format on request.

Regards,

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