2-15-2011

Final Report: Appendix F. LID Driveway Retrofit at Ocean Spray Processing Facility, Middleboro – Supporting Information

Horsley Witten Group, Inc.

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MEMORANDUM

TO: Pauline Jeong, Sustainability Manager, Ocean Spray Cranberries
   Robert Mulennix, Environmental Health and Safety Manager, Ocean Spray Cranberries
   Mark Rapoza, Technical Services Manager, Middleboro Plant, Ocean Spray Cranberries

FROM: Richard A. Claytor, Jr., P.E., Principal Engineer
      Ellie Baker, Project Manager

DATE: December 17, 2009

RE: Demonstration Projects at Ocean Spray Cranberries – Middleboro Processing Plant
    Taunton River Watershed Management Plan

As you know, staff of the Horsley Witten Group, Inc (HW) and the Nature Conservancy (TNC) met with you back in late September of this year in your Headquarters office to discuss the goals of the Taunton River Watershed Management project and to see if Ocean Spray Cranberries might be interested in participating as one of our watershed demonstration projects. We then met again in late October and participated in a tour of the Middleboro Processing Plant grounds to review potential project options for demonstration of so-called low impact development (LID) stormwater management measures at the Middleboro Processing Plant. We also discussed the possibility of capturing rooftop rainfall for re-use as make-up coolant water. We later met directly with Mr. Rapoza in early November to review some drainage plans of the plant and view the plant rooftop and roof drainage system. Based on these meetings and tours, HW agreed to develop a list of potential projects and locations for further consideration by Ocean Spray Cranberries. This memorandum serves to present you with that list of potential projects.

We have identified five separate potential LID locations on the plant with a variety of drainage characteristics and one rooftop capture/re-use location (see attached figure). Sites were identified based on current drainage patterns and the potential to offer improved stormwater management for the contributing drainage area. The LID stormwater management approach is designed to capture and manage runoff from relatively small areas and uses a natural approach to treat, and where feasible, infiltrate stormwater into the underlying soils. Each of the five identified locations employs a basic strategy of collecting roadway and/or parking lot runoff and providing water quality treatment in one of three LID practices: a vegetative swale, a bioretention system (also sometimes referred to as a rain garden), or a constructed wetland. The
vegetative swales would consist of an organic-rich soil supporting a range of herbaceous and woody vegetation, and depending on the groundwater elevations, may or may not have an underdrain pipe system. Bioretention is an alternative stormwater management practice that uses a soil matrix and landscaping to filter stormwater pollutants and, where possible, infiltrate into the underlying soils. The constructed wetland practice supports a shallow permanent pool of water and a range of emergent vegetation (see photos below).

Potential Demonstration Sites

The general concept and approximate size of the project for each of the five sites are presented below.

Site 1: This area drains a large parking lot that appears to be underutilized employee parking and that currently flows to one of two catchbasins. The proposed concept would be to reconfigure

Example of Bio-Swale Draining Residential Roadway

Example of Bioretention Draining Parking Lot

Example of Constructed Wetland Draining Highway
the drainage so that it would first flow into a bioretention facility and overflow in the catchbasins. The design might require the removal or reconfiguration of a few to several parking spaces and occupy an area of approximately 1,200 to 1,400 square feet.

Site 1: Bioretention Area Within Center of Parking Lot

Site 2: Grass Swale at Entrance Driveway

Site 2: This site drains a portion of the entrance road and adjacent impervious area that is serving as an existing storage area for cranberry crates. An existing grass swale of approximately 475 feet drains this area. The concept would be to convert this turf grass to a mix of herbaceous and woody vegetation and add organic soil, thus allowing for longer stormwater residence time and more effective stormwater treatment.

Site 3: This area drains runoff from the loading dock and rooftop near the main entrance. We propose to convert the existing grass swale to a vegetated swale with a mix of herbaceous and woody species and other aquatic features (such as boulders and small pool areas). The length of the swale would be approximately 200 feet.
Site 4: This area drains runoff from the parking lot in front of the main entrance. The existing grass swale could be modified to utilize a bioretention soil matrix to support a mix of trees, shrubs and perennials. The approximate surface area of the facility could be as much as 3,000 square feet.

Site 5: This area drains runoff from the driveway and adjacent overflow parking lot. The area appears to be wet with shallow depth to groundwater. The concept would be to design this as a constructed wetland with a shallow permanent pool and mix of emergent wetland vegetation.
Additional Project Site and Concept

In addition, we discussed the possibility of using rainfall from the rooftop drainage system as make-up water for one or more of the cooling systems or for some other non-potable use. HW reviewed the mechanical drawings for a portion of the facility’s roof (Receiving Facility, dated 11/17/8?). This rooftop precipitation is collected in a series of risers that discharge to the existing storm drain system to the southwest corner approximately 9 feet below grade.

Based on the current piping arrangement, it would be difficult to capture this water and direct it to a storage facility, and would require pumping in order to direct the water to another location for re-use. However, it is our understanding that in the near future, this rooftop and drainage system may be completely overhauled at which time it might be cost effective to direct water to a large holding tank for re-use. There is a relatively level grass area immediately adjacent to the
existing refrigerated building (far southeast corner) that might serve as an ideal location for either an above ground, or below ground storage tank.

Next Steps: Site and Project Selection

Based on our initial assessment of the Middleboro Processing Plant, it seems that there are several options for the installation of one or more LID demonstration projects in the near-term. Depending on the schedule for roof replacement work and whether or not the existing drainage system is contemplated for overhaul, it seems possible that a rainfall re-use project would be feasible in the longer-term.

Please review the attached map and this memo and let us know if you are interested in pursuing any of these potential projects further. We would like to move forward with one of the five demonstration projects listed above, or possibly two if they are located adjacent to one another. At this time, we do not believe that the roof runoff re-use project would fit within our current scope of work and budget within the Taunton River Watershed Management Plan project, but would be happy to explore this project with you further in addition the selected demonstration project.

If you have any questions or you would like more information on the various stormwater management options, please do not hesitate to contact Rich Claytor at 508-833-6600 or Ellie Baker at 978-499-0601. We hope to be in a position to move forward with the initial design process before February 1, 2010. We look forward hearing your project selection in the meantime. Thank you again for meeting with us, conducting the tours of your facility and in your interest in this project.
**General Construction Notes:**

1. All equipment shall be installed in accordance with the instructions provided by the manufacturers and all applicable codes.
2. Equipment shall be checked for proper operation and alignment before the start of installation.
3. All equipment shall be placed in the correct position and levelled as required.
4. All electrical connections shall be made according to the manufacturer's specifications.
5. All piping shall be installed in accordance with the manufacturer's instructions and all applicable codes.
6. All mechanical connections shall be made according to the manufacturer's specifications.
7. All equipment shall be weatherproofed and protected from the elements.
8. All equipment shall be test run to verify proper operation.
9. All equipment shall be installed in a location that is accessible for maintenance.
10. All equipment shall be installed in a location that is safe for operation.

**Special Notice to Contractors:**

1. All equipment shall be installed in accordance with the instructions provided by the manufacturers and all applicable codes.
2. All equipment shall be checked for proper operation and alignment before the start of installation.
3. All electrical connections shall be made according to the manufacturer's specifications.
4. All piping shall be installed in accordance with the manufacturer's instructions and all applicable codes.
5. All mechanical connections shall be made according to the manufacturer's specifications.
6. All equipment shall be weatherproofed and protected from the elements.
7. All equipment shall be test run to verify proper operation.
8. All equipment shall be installed in a location that is accessible for maintenance.
9. All equipment shall be installed in a location that is safe for operation.

**Legend:**

- **BE**: Building Equipment
- **DC**: Distribution Center
- **EL**: Electrical System
- **MC**: Mechanical System
- **SC**: Structural System
- **TC**: Transportation System

**Notes:**

- All equipment shall be installed in accordance with the instructions provided by the manufacturers and all applicable codes.
- All equipment shall be checked for proper operation and alignment before the start of installation.
- All electrical connections shall be made according to the manufacturer's specifications.
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NOTES:

CONTINGENCY IS PROVIDED BASED ON 75% DESIGN PLANS REFLECTING THE FACT THAT UNCERTAINTY EXISTS BETWEEN THIS STAGE AND CONSTRUCTION STAGE DRAWINGS. CONSTRUCTION ESTIMATES WILL BE DEPENDANT ON FACTORS RESOLVED AT THE CONSTRUCTION BIDDING STAGE.