

INTERIM REPORT

FLOOD CONTROL MASTER PLAN

In late December 2007 the Flood Control Master Plan engineering assessment work was awarded to Coughlin Environmental Services, LLC (CES) of Stoneham, MA. Over the winter, plan research of existing drainage components, both public and private, was conducted to establish a basis for subsequent hydraulic analyses. Historical flooding data was compiled and interviews with various parties have led to a preliminary identification of problem areas. The plan on the reverse side of this report depicts those preliminary flood prone areas. (Additional areas may also be identified as work progresses.) Within CES's proposal to the Town, Jacob's Meadow was given a high priority for evaluation due to an apparent worsening of flood conditions attributed to James Brook flows. Initial field survey of critical hydraulic structures was conducted over the past three months along James Brook from its outfall at Cohasset Cove to its headwaters at Sanctuary Pond to confirm and establish hydraulic attributes of the drainage system in order to properly model existing conditions and the impacts of future alternatives. Preliminary hydraulic modeling is underway and based upon these preliminary evaluations; interim findings are summarized below for the **James Brook** and **Jacobs Meadow** system.

1. The frequency of flooding has increase recently and coincided with the completion of MBTA construction activity. MBTA improvements have reduced hydraulic restrictions in the upper watershed of James Brook through culvert and channel upgrades and have reduced "in-soil" storage by the addition of rail bed under-drain systems which reduce such storage and provide an additional piped conveyance for flood waters. The net result is reduced detention within the watershed.
2. Past Town culvert improvements which reduced Town Center flooding now allow these increased James Brook flows to be more easily conveyed to Jacob's Meadow. Although these improvements reduce the frequency of Town flooding under most conditions, flooding is exasperated when the tide gates to Cohasset Cove are shut under high tide or storm surge conditions.
3. Stormwater flooding within Jacob's Meadow cannot be fully eliminated due to the tidal restrictions, without stormwater pumping facilities to move flow out of the area even during high tide conditions.
4. Flooding can be reduced by removing hydraulic restrictions at the outfall to Jacobs Meadow to allow more flow to exit the meadow during low tide conditions when tide gates are open. Improvements include enhancing hydraulic conditions of the outfall channel near the American Legion (currently under design), decreasing hydraulic restrictions imposed by current tide gates (currently under design), improving hydraulic routing through the meadow via channel maintenance and removal of phragmites via surface excavation and dredging to increase storage volume within the meadow.
5. Flooding can be reduced by providing localized impoundment areas within the watershed to detain stormwaters. This will allow a delay of storm flows enhancing the abilities of the tidally restricted system to drain over several low tide cycles. Detention will also enhance settling and infiltration of stormwaters, promoting pollution attenuation.
 - A detention basin could be constructed along James Brook in the upper watershed reach known as "The Wiggle". This detention basin could reduce tributary stormwater flow rates by 80% reducing this areas peak flow contribution. Environmental permitting could be extended due to existing wetlands in the area.
 - Improvements at the outfall to Sanctuary Pond which would increase stormwater storage by lowering seasonal water levels and reducing overtopping potential could reduce flood potential under "extreme" weather conditions as well as improve dam safety.
 - Similar improvements and seasonal variation of the Ellm's Meadow control structure can enhance stormwater detention along the Stewart's Brook section of the watershed.
 - Installing control structures at culvert inlets and adding stormwater detention within the upper watershed to increase storage will delay peak flows but will cause minor stormwater flooding on private properties. Town acquisition of flood corridors will enhance the Town's ability to institute more beneficial improvements in these areas and to control the extent of localized flooding.
6. Adding Best Management Practices (BMP's) (pollution removal methods) within the watershed can also be beneficial to detain and treat stormwater flows helping to infiltrate and delay peak flow contributions.