

Review of the Doan Brook Watershed Study Report

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Executive Summary

Across the nation, urban and urbanizing communities like those in the Doan Brook Watershed are faced with the need to meet increasingly stringent water, wastewater, stormwater and other environmental regulations. Historically, urban environmental problems were addressed with centralized, hard infrastructure solutions, featuring end-of-pipe treatment works. Today, low impact development (LID) is a relatively new approach to stormwater management receiving increased attention as a potentially cost effective means of reducing the impacts of development on the landscape. By seeking to minimize stormwater runoff at its source, LID technologies minimize the need for runoff mitigation infrastructure downstream in the watershed.

The purpose of this review was to assess the extent to which low impact approaches were considered in the development of the Doan Brook Watershed's various management plans. These plans were developed through a participatory process involving the Doan Brook Watershed Study Committee (WSC) and the Northeast Ohio Regional Sewer District (NEORS), and were summarized in a document entitled the Doan Brook Watershed Study Report (DBWSR), dated August, 2001. The following review is based almost exclusively upon the data and information as presented in that approximately 450-page document.

The DBWSR describes the development of four management plans:

- The Biotic Management Plan
- The Channel and Floodplain Management Plan
- The Stormwater Management Plan
- The Wastewater Management Plan

In addition, and resulting from a decision-making process external to development of the DBWSR, the NEORS was to construct the Heights/Hilltop Interceptor Sewer (HHI Project). The purpose of the HHI Project was to reduce the volume of combined sewage discharges to Doan Brook from 759 to approximately 439 million gallons per year. The decision to construct the HHI Project is not addressed in the DBWSR. Instead, the "baseline conditions" described in the DBWSR refer to the Doan Brook Watershed with the HHI Project already in place. Consequently, no critique of the alternatives to the HHI Project could be provided in this review.

A summary of the plans as presented in the DBWSR follows below:

The final recommended Biotic Management Plan involved both direct manipulation of plant and animal populations, and indirect management of the environs in which the organisms live. The plan sought to a) enlarge and diversify the biotic community, b) increase and diversify habitat, and c) lead to the development of a lake management plan. The plan did not specifically address the diffuse sources of the poor water quality that are responsible for the degraded biological conditions in the watershed. Rather, it assumes that these factors will be addressed by the other three plans.

The final recommended Channel and Floodplain Management Plan included a variety of practices that serve to a) stabilize degrading channel banks, b) reduce flooding, c) control trash and debris, d) improve refuge areas and habitat and e) remove fish migration barriers. Although

there was ample mention in this chapter of the DBWSR of the extent to which runoff from upstream urban development is a cause of channel instability and flooding, the final recommended practices did not include any distributed, low impact runoff capture measures in the Doan Brook watershed.

The purpose of the Stormwater Management Plan was to address the problems associated with stormwater runoff quality (heavy metals, bacteria, phosphorus, sediments, toxics, oil, road salt) and quantity (high flow velocities, low base flows). The final recommended plan includes a combination of policy actions, operational changes, and capital improvement projects, with emphasis placed on implementing the six minimum control requirements of NYPDES Phase II storm water program. The recommendations are classified as measures that a) reduce the sources of pollutants carried in stormwater, b) reduce the amount and improve the treatment of stormwater runoff. However, although several capital projects for stormwater storage and infiltration are mentioned, the final plan falls short of any significant commitment of resources towards the retrofit of distributed runoff control measures throughout the watershed.

Lastly, the purpose of the Wastewater Management Plan was to address the inability of the existing Doan Brook Interceptor to adequately convey stormwater runoff and wastewater to the treatment plant. As interpreted in the DBWSR, regulations required that either additional wet weather flow be captured, or overflows be treated and/or stored. Consequently, the framers of the DBWSR took the position that “new facilities are necessary to relieve surcharge in the existing interceptor system and to allow for the capture of additional wet weather flows.” This chapter of the DBWSR also does not consider low impact runoff reduction measures. Rather, the final plan calls for the construction of a \$118 million tunnel, which would reduce CSOs by providing storage of approximately 45 million gallons of wet weather flow. In addition, the plan calls for a number of additional practices that would involve a) upgrading the existing sewer system and b) adding sewer system capacity.

There appear to be several reasons why LID technologies were not seriously considered in any of the management plans. First, certain decisions appear to have been made outside of the Doan Brook Watershed Study process. The HHI project, for example is a major infrastructure investment projected to reduce CSOs in the watershed by almost 50%. Although the reduction in CSOs is significant, the decision to construct an interceptor pipe represents a large commitment of the District’s financial resources. Because the planning of the HHI project was external to the watershed planning process, comparison of the benefits of this project with a distributed LID approach was not presented in the DBWSR. Ideally, these two decision making processes would have been fused.

Secondly, the framers of the DBWSR suggest throughout the report that distributed runoff reduction measures are not technically feasible, not cost effective, not easily implemented, and not reliable. Based on the information provided in the DBWSR, and on the increasing attention LID technologies are receiving nationwide, these claims appear to be unsubstantiated.

Thirdly, the framing of alternatives appears to have diverted the attention of the WSC away from consideration of the full potential of low impact runoff reduction measures in the watershed. This is perhaps most obvious in the alternatives presented in the development of the Wastewater

Management Plan, none of which include runoff reduction measures. The alternatives presented in the development of the Stormwater Management Plan also do not include a concerted effort to incentivize the retrofitting of BMPs *throughout* the various subwatersheds, at a level at which significant runoff reductions would be achieved. Further, the development of other management plans – most notably the Biotic Management Plan – forego discussions on these issues, and rely on other sections of the DBWSR for adequate coverage.

For all these reasons, it is not possible to evaluate whether a comprehensive LID approach would have been more or less cost-effective than the HHI Project, or any of the final recommended practices included in the DBWSR.

We conclude this report by recommending that the final recommended management plans be revisited after conducting an independent study into the cost effectiveness of LID as a means of achieving the goals of the four management plans.