**Section 375.403 Field Studies**

a) First flush volumes may be determined through direct field measurement at a point of overflow, modeling of the collection system or equally accurate techniques. Either approach is dependent on a field monitoring program as described in (c) below. Commonly, first flush for the design storm is determined by direct measurement of flush rate and volume for several storms of varying intensity and extrapolating to the design storm (1.2 in/hr.).

b) Detailed monitoring may be limited to less than the total number of overflow locations in the system when monitoring all locations would be impossible or would not be helpful in demonstrating the capabilities of the system. Sampling sites should be selected in order to monitor the largest discharges in terms of loading. Consideration shall also be given to the different land use patterns, population densities, and sewer system characteristics tributary to a given overflow site within the study area.

c) General guidance for field measurement includes:

1) A minimum of 3 storms should be monitored for each sampling site.

2) There shall be a least one rain gauge located within the study area. For systems serving an area of over 2 squares miles, multiple gauges shall be used and located to achieve gauge spacing of 2 miles or less throughout the study area. Rain gauges should be on the continuous recording type, otherwise manual readings should be recorded on intervals of 10 minutes or less. If only one gauge is used it should be located near the center of the study area; multiple gauges shall be located so as to identify variations in storm intensity across the study area.

3) Flow monitoring shall be initiated at the onset of a storm and continue through and beyond the sewer flushing period. Flow meters may be located in interceptor manholes, diversion structures, outfall sewers or other locations where dependable operation is assured. Caution should be taken to protect instrumentation from flooding, corrosion, excess humidity, vandalism or other factors which jeopardize either the equipment or reliability of the data.

4) Water samples should be collected at the onset of the storm and at 10 or 15 minute intervals thereafter. In most instances a moderate to heavy storm will fully flush the system within two hours. Most automatic discrete samplers have adequate capacity to contain the entire flush period with 10 minutes sampling frequency. Again, caution should be taken to protect against flooding, corrosion, or excess humidity that may cause malfunctioning or failure of the mechanical or electronic components of the sampler. Samples should be analyzed for BOD5 as defined in 35 Ill. Adm. Code 304.120(a), total and volatile suspended solids with sample preservation, and analysis consistent with Standard Methods 15th Edition (1980).

5) Overflow points that are not subject to direct flow and quality monitoring should be inspected during the storm period to determine if the overflows are functioning and to estimate the rate and duration of overflow.

(Source: Added at 8 Ill. Reg. 19436, effective September 26, 1984)