

Kishwaukee North Watershed Assessment

Introduction

Material presented in the following summary documents current stormwater management and flooding issues for the Kishwaukee North Watershed. Information presented is based on a review of available information related to current conditions in the drainage basin. No comprehensive analysis of stormwater management and flooding issues in the watershed has been performed in the last 20 years.

Watershed Description

Description and Land Use

The Kishwaukee North watershed is located to the south east of the City of Rockford and drains into the Kishwaukee River. It is a combination of the North bank areas of EPA watersheds: ILPQ02 and ILPQ12. The watershed drains approximately 8,413 acres at its mouth. Roughly 40% of the watershed is located within the City of Rockford. The remaining 60% of the watershed extends into the Villages of Cherry Valley and New Milford, as well as unincorporated Winnebago County.

Watershed Statistics: Kishwaukee North	
Total Area:	8,413 ac.
Total Area within City:	3,204 ac.
% of City within Watershed:	8.1 %
Other Stakeholders:	Cherry Valley & New Milford
No. of Detention Facilities	14
No. of Outfalls	1

The Kishwaukee North watershed is about 30% developed. The majority of the current development has occurred in the far west and far-east portions of the watershed. The Kishwaukee North watershed has light residential developments in almost solely the north eastern portion. Along the south there is little to no development, mostly just overgrown natural land, and riverside park areas. A large property worth noting is the Greater Rockford Airport, in the westernmost part of the watershed. Most homes within the watershed are not built adjacent to the creek, rather are located in small developments. The City of Rockford may experience development around the Airport and North of Route 20, between Alpine and Mulford Roads, within the current municipal boundaries, with possible annexations in the future.

Topography and Soils

The topography of the Kishwaukee North watershed is the only watershed in the City of Rockford which drains directly into the Kishwaukee River. The topography is also more varied

because it covers a more gently sloping, narrow section around the airport and east along the River, but a more steeply sloped, wide portion just south of Madigan Creek watershed. Ground elevations within the watershed range from about 875 feet NAVD near State highway 20 and Alpine Road to about 650 feet NAVD near the Kishwaukee River's confluence with the Rock River. The geography is steep and high in the northeast area and low-lying and flat in the southwest area by the airport.

Soils within the Kishwaukee North watershed consist completely of type B soils, with a large, concentrated slab of types D and A soils in the western portion near the airport. Type B soils are soils with moderately low runoff potential when thoroughly wet. Water can be transmitted through these soils without impediment. Type B soils typically have less than 20 percent clay, and between 50 and 90 percent sand with a loamy sand or sandy loam textures. These soils have moderately fine to moderately coarse textures. Type A soils have a high infiltration rate even when very wet. They consist of well-drained sands and gravels, and have less than 10% clay. The runoff potential is low, as water absorbs quickly into these soils. Type D soils are characterized by properties that restrict water movement through the soil. Type D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. They have high runoff potential when thoroughly wet.²⁴ The predominance of type B soils in the Kishwaukee North watershed should facilitate infiltration of rainfall in pervious areas, but the prevalence of Type D soils near the Airport indicate greater flooding risk due to the increased possibility of high runoff during a wet weather event.

Primary Receiving Stream

Kishwaukee River is the receiving stream for the Kishwaukee North watershed. The River is approximately 81,000 feet (15.3 mi.) long to the Winnebago County border, and exists in essentially a natural state. The Kishwaukee River has a stream bed elevation of 678 feet (NAVD) at its confluence with the Rock River, and 720 feet (NAVD) at its origin. The creek has a very gradual slope, with an average fall of under 3 feet per mile. The profile of the stream is shown in the Flood Profile extracted from the 2006 Flood Insurance Study for Winnebago County and Incorporated Areas.

There are no significant impoundments on Kishwaukee North.

There are no USGS Gauging stations in Kishwaukee North.

Flow data for the Kishwaukee North watershed is unavailable.

²⁴ Burke, Christopher and Thomas Burke. HERPICC Stormwater Drainage Manual. West Lafayette, Indiana: Purdue Research Foundation, 1994.

Given the character of the watershed, flooding within Kishwaukee North is of a flashy nature. Localized flooding along the creek is aggravated by the number of small bridges, vegetative debris and trees along the stream channel. As shown in Figure KN-1, the floodplain along Kishwaukee North is relatively narrow within the watershed drainage area, except the area south of the Airport, where the floodway and floodplain cover a significant area. Areas where the mapped floodplain appears to include developed properties include:

- Greater Rockford Airport
- North of Blackhawk and Mulford Rd.

Records maintained by the Federal Emergency Management Agency (FEMA), indicate that no letters of map revision (LOMRs) have been issued for development projects in the Kishwaukee North watershed during the past 30 years.

Water Quality and NPDES Discharges

The Kishwaukee River is one of several of the area's streams to have been rated as highly valued aquatic resources by state scientists using complex criteria of water and habitat quality. It is a clear-running, spring-fed stream with runs, riffles and pools. The waters are generally cool with thriving aquatic life, especially mussel species. Sedimentation has occurred in certain portions of the creek, indicating that the stream is susceptible to impacts resulting from erosion of upstream agricultural lands.

No National Pollutant Discharge Elimination System (NPDES) point sources have been identified within the Kishwaukee North watershed.

Existing Drainage Network

Drainage within the Kishwaukee North watershed occurs through predominantly surface drainage paths and creek channels. In the more developed north-eastern part of the watershed, a few gravity storm sewers have been constructed. Figure KN-2 shows the location of these sewers. These differences in drainage mechanisms are analogous with the respective development in these sections of the watershed.

Figure KN-2 also shows the general location of identified detention basins and storm sewer outfalls within the Kishwaukee North watershed. The Kishwaukee North watershed has 14 identified detention facilities, all in the northeastern part of the watershed. There is one identified storm sewer outfalls within the watershed.

Available Data Resources

Previous Drainage Studies

A review of available data identified no recent, comprehensive studies of drainage issues within the Kishwaukee North watershed. Previous drainage studies that included consideration of the watershed are listed below:

“Greater Rockford Airport Authority Master Drainage Study Preliminary Report (Phase 1).” Crawford, Murphy, and Tilly, Inc. October 1993.

Historic Flow Data

Readily available flow data for the Kishwaukee North watershed is presently limited to calculated flood flows published in the Flood Insurance Study for Winnebago County and Incorporated Areas are summarized in Table KN-1 on the following page. It is important to note that these flows are based on analyses performed more than 30 years ago and likely do not reflect current conditions in the watershed.

Historic Water Quality Data

No source of historic water quality data has been identified for the Kishwaukee North watershed. (pending input from David Pott)

Other

Floodplain and Floodway:

Flood Insurance Study: Winnebago County and Incorporated Areas, (FEMA, 2006)

Soil Characteristics:

“Soil Survey Geographic (SSURGO) database for Winnebago County, Illinois.”

Fort Worth: U.S. Department of Agriculture, Natural Resources Conservation Service, 2007.

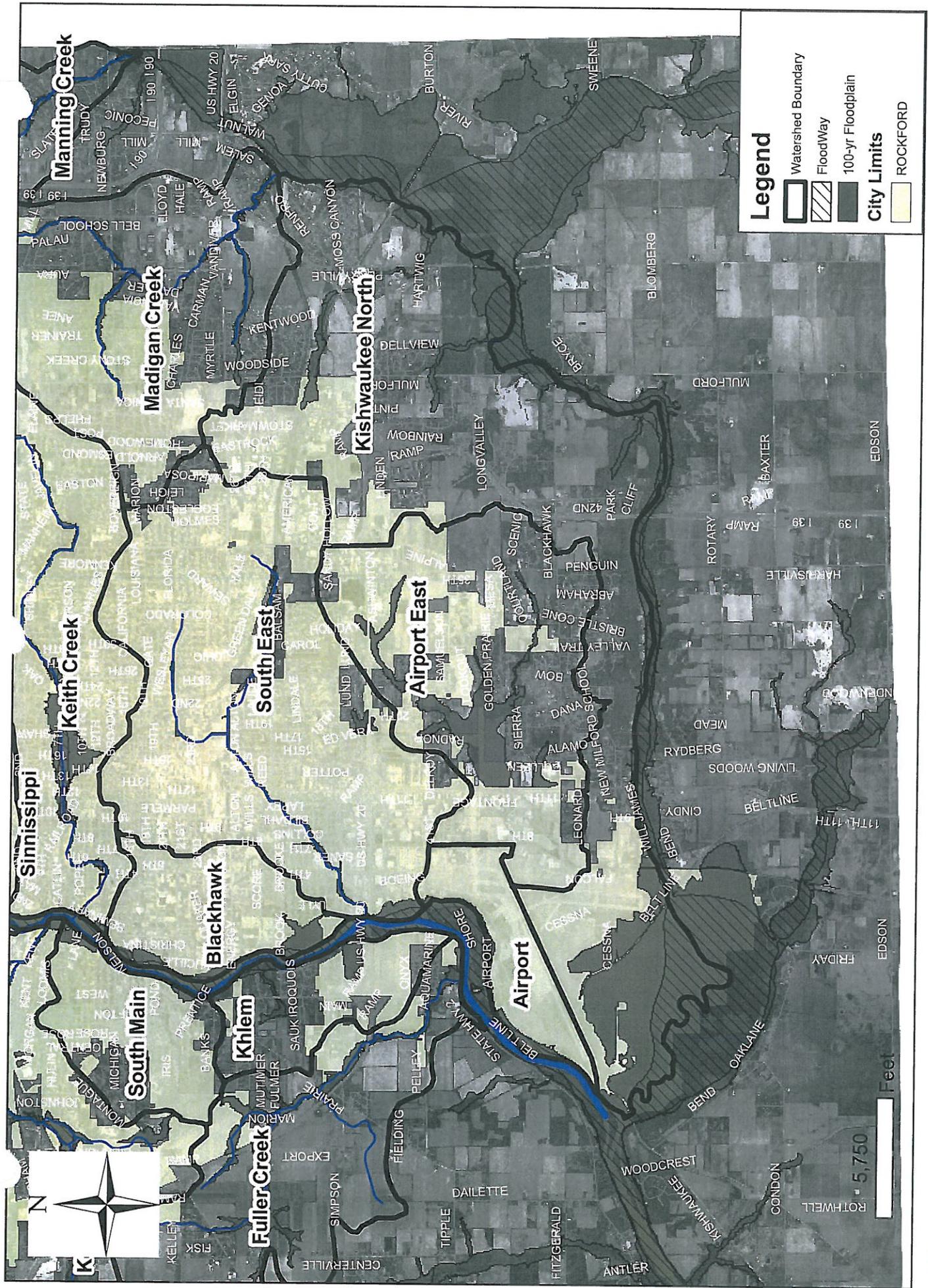
URL:<<http://SoilDataMart.nrcs.usda.gov/>>

Drainage Issues

There is very little existing information on the nature of flooding in the Kishwaukee North watershed, as it has not been studied in any of the literature available. Judging from the aerial and watershed characteristics, the gentle sloping, narrow watershed suggests flooding due to overtopping of the Kishwaukee banks would be most likely along the center of the watershed. The impervious soils and airport development in the west may cause runoff flooding from wet-weather events. The City has done a good job of limiting development within the floodplain and at this time, there seems to be no areas that would be adversely affected by over-bank flooding, besides the Airport.

Table KN-1
FLOOD INSURANCE STUDY FLOWS (1976)
KISHWAUKEE CREEK, ROCKFORD, ILLINOIS

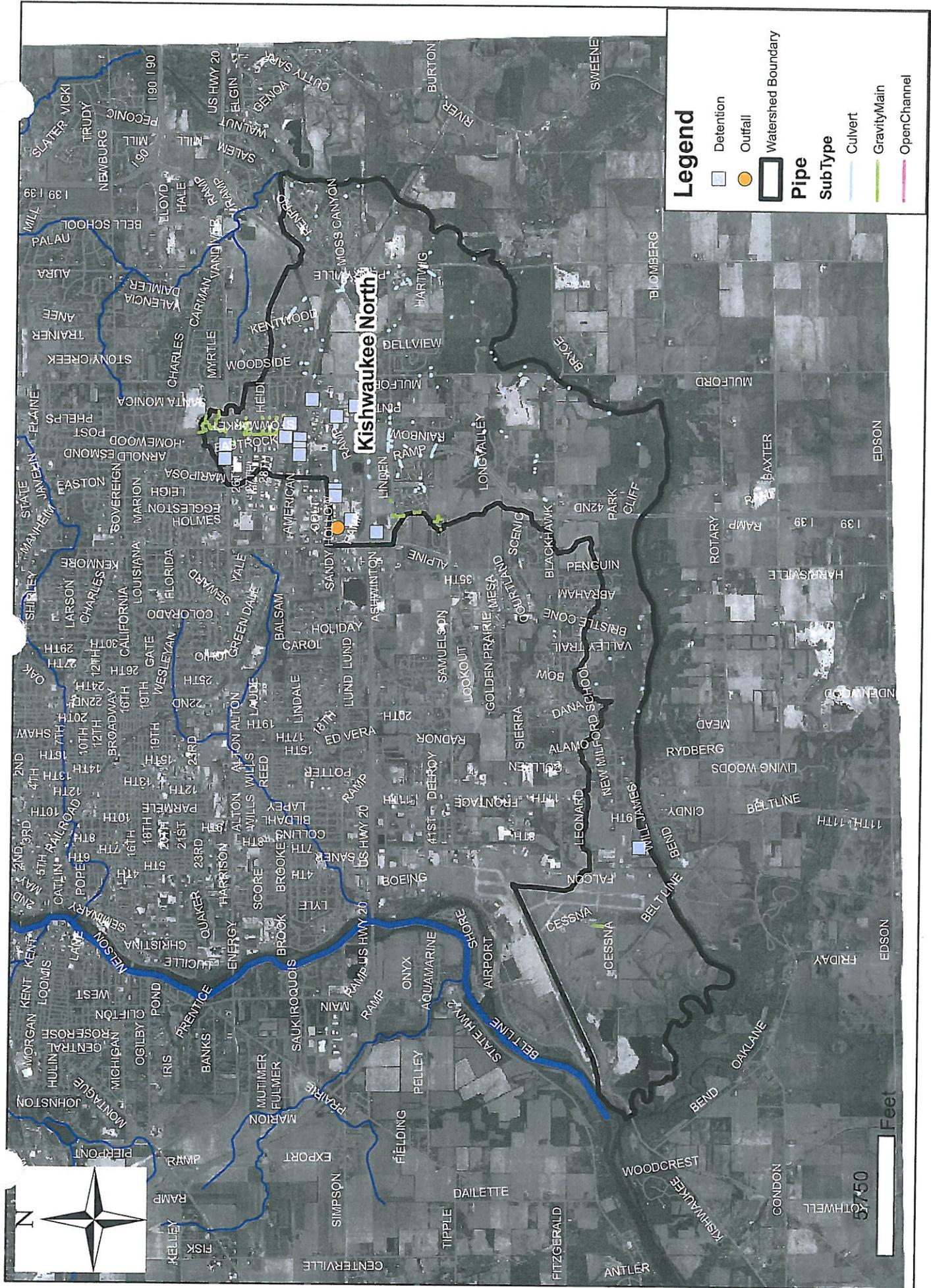
Cross Section Location	50-year Flow		100-year Flow	
	Flow (cfs)	Flow (cfs/acre)	Flow (cfs)	Flow (cfs/acre)
At confluence w/ Rock River	28,000	0.035	32,100	0.040
At Perryville	25,800	0.037	30,800	0.044



Kishwaukee North Flooding Issues
 City of Rockford, Illinois
 Autumn 2008

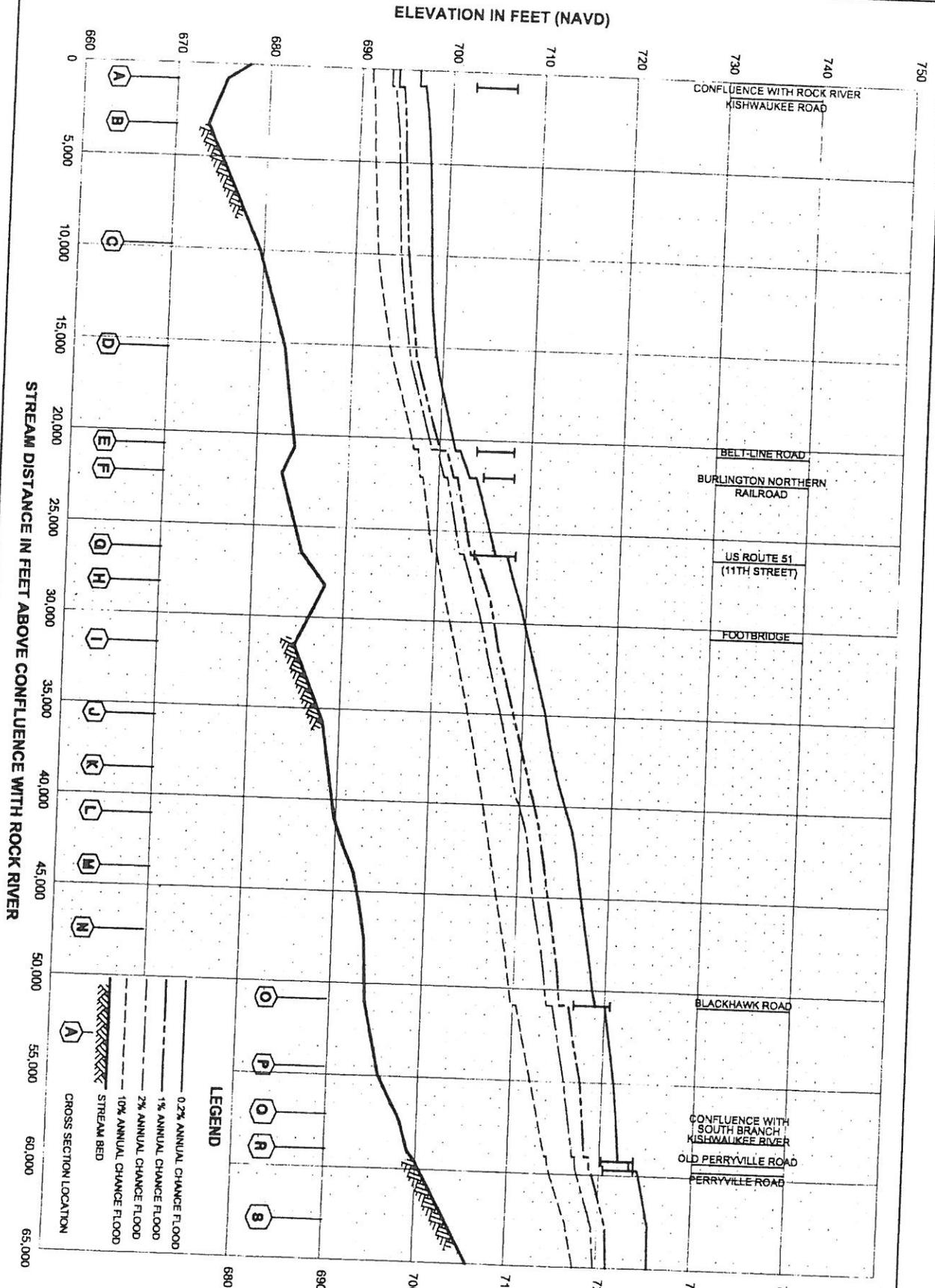
Figure KN - 1





Kishwaukee North Outfalls, Detention and Storm Sewer
 City of Rockford, Illinois
 Current Data as of Autumn 2008





19P

FEDERAL EMERGENCY MANAGEMENT AGENCY
WINNEBAGO COUNTY, IL
 AND INCORPORATED AREAS

FLOOD PROFILES
KISHWAUKEE RIVER