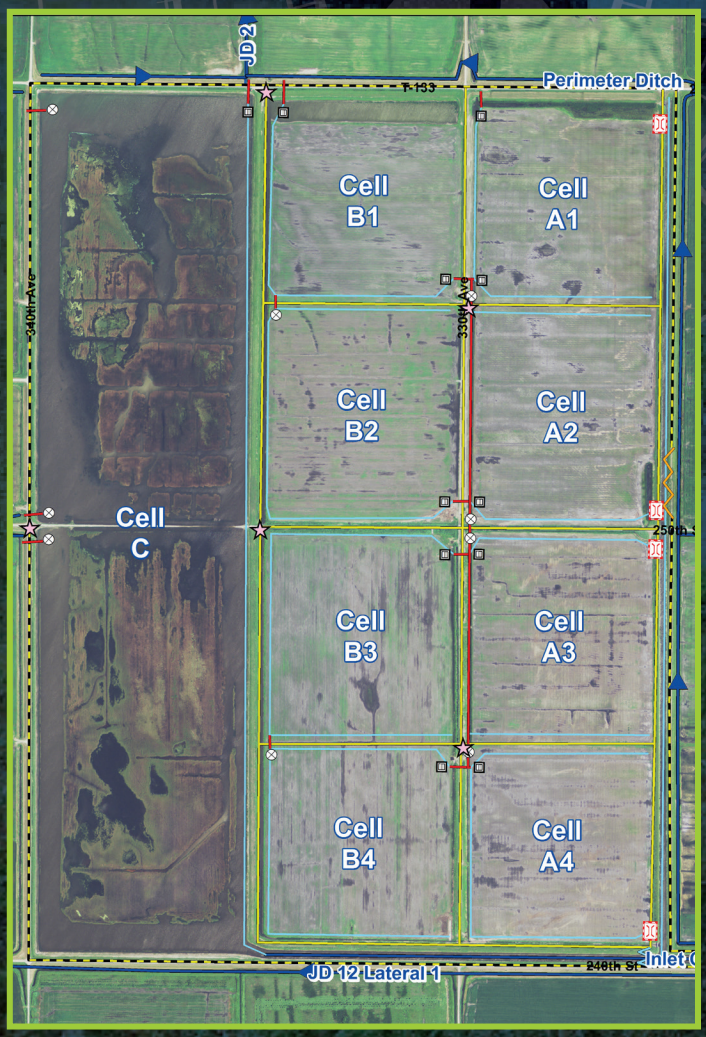


Legend

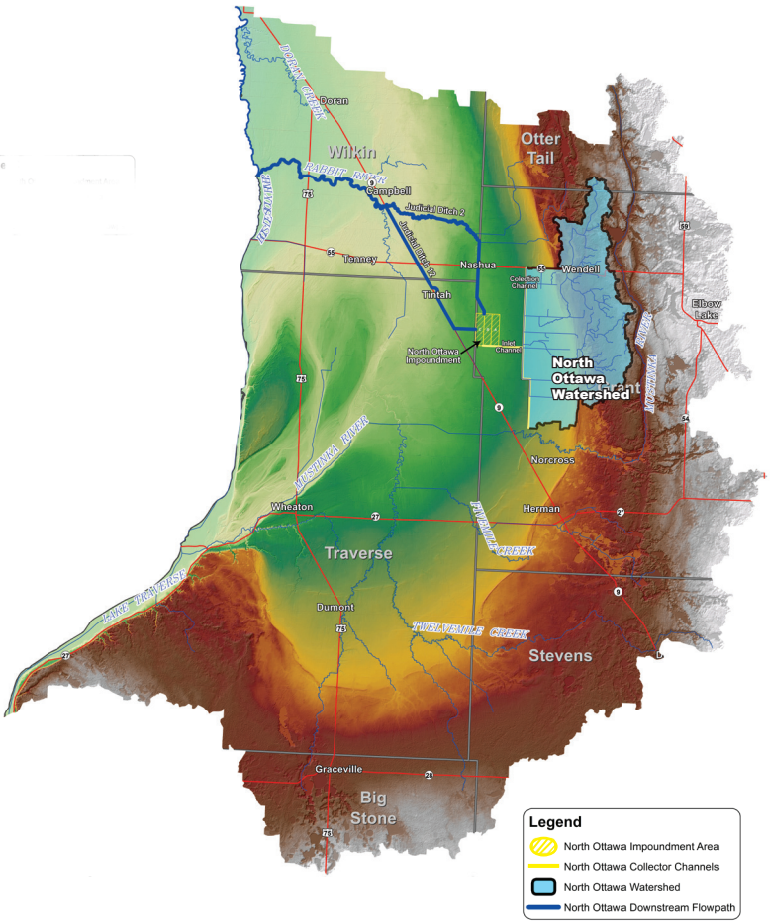
- Perimeter Levee Dike
- Interior Levee
- Internal Flowpaths
- Inlet Weir
- Emergency Spillway
- Culvert
- Control Structure
- Inlet Structure
- Gate Control
- Monitoring Equipment

NORTH OTTAWA

A flood control and
Natural Resource Enhancement project
in the Bois de Sioux Watershed District
near the headwaters of the Red River

Bois de Sioux Watershed District

Bois de Sioux Watershed District
704 S. Hwy 75
Wheaton, MN 56296
320.563.4185



An 8.5-mile-long collection channel intercepts the westward flow of existing ditch laterals and diverts the flow to a 1.5-mile-long inlet channel, diked on both sides, that conveys water to the impoundment.

The impoundment area, diked on all four sides, stores the water and eventually releases it through controlled outlets into Judicial Ditch 2 and Judicial Ditch 12.

FLOOD CONTROL OBJECTIVES

- Meet 10-year agricultural drainage standard along the channels
- Provide inlet capacity for 100-year design flood flows into the impoundment
- Limit outflows from all 100-year design floods to Judicial Ditch 2 capacity with no automatic release to Judicial Ditch 12
- Minimum dike freeboard of 3 feet above 100-year design flood level
- Minimum dike freeboard of 2 feet during emergency spillway design/ flood

NATURAL RESOURCES OBJECTIVES

- Water quality enhancement
- Provide feeding and resting habitat for migratory birds
- Provide feeding and resting areas for migrating shorebirds by exposing mudflats during the migration.
- Shallow flooded vegetation areas provide feeding for ducks and shorebirds
- Downstream flow augmentation into the Rabbit River
  - Provide 5 cubic feet per second continuous discharge in a normal year's ice free months
  - Improve in-stream fishery
  - Enhance water supply and waste assimilative capacity
- Provide opportunity for viewing shorebirds and waterfowl
- Increase water quality by removing sediment and nutrients

PERIMETER DITCH AND LEVEES

- Exterior perimeter ditch around the impoundment intercepts potential seepage and provides an outlet for existing local drainage
- Levees add 141 acres of permanent prairie

INTERIOR LEVEES

- Interior dikes subdivide the impoundment into nine pools
- Internal control structures allow movement of water between pools.
- Levees add 160 acres of permanent prairie

CONTROL STRUCTURES

- Outlet control structures release water into Judicial Ditch 2 and Judicial Ditch 12 (through gated outlet and ungated overflow)
- An emergency spillway located on the east dike releases water to prevent dike overtopping

COLLECTION CHANNELS

- The two collection channels intercept the Judicial Ditch 12 and Grant County Ditch 22 systems to divert runoff from the 74 square mile watershed into the impoundment
- Channel structures add 183 acres of permanent prairie

FUNCTIONAL DESIGN PARAMETERS

Impoundment Area ..... 3 square miles
Drainage area ..... 74 square miles
Outlet elevation in Judicial Ditch 2.. 1001.0 feet mean sea level
Collection Channels ..... 10 miles
Low ground elevation in pool ..... 1,006.0 feet mean sea level
Gate control elevation ..... 1016.2 feet mean sea level
Storage ..... 16,160 acre-feet (4.1 in. of runoff)
Emergency spillway elevation ..... 1,017.3 feet mean sea level
Storage .....18,210 acre feet (4.6 in. of runoff)
Top of dam elevation ..... 1,020.3 feet mean sea level

INTERNAL OPERATIONS

- Four sheetpile inlet structures are set at varying elevations to control where water enters the impoundment
- Four interior and two transfer control structures used to manipulate the movement of water between cells within the impoundment
- Six outlet structures used to control the release of water from the impoundment
- Five monitoring stations for observing water surface elevations and flow
- The agricultural cells generate funds for the maintenance and operations of this project. After harvest, the crop stubble is flooded to provide food for waterfowl.
- Cell C provides 608 dedicated, permanent acres for wildlife habitat