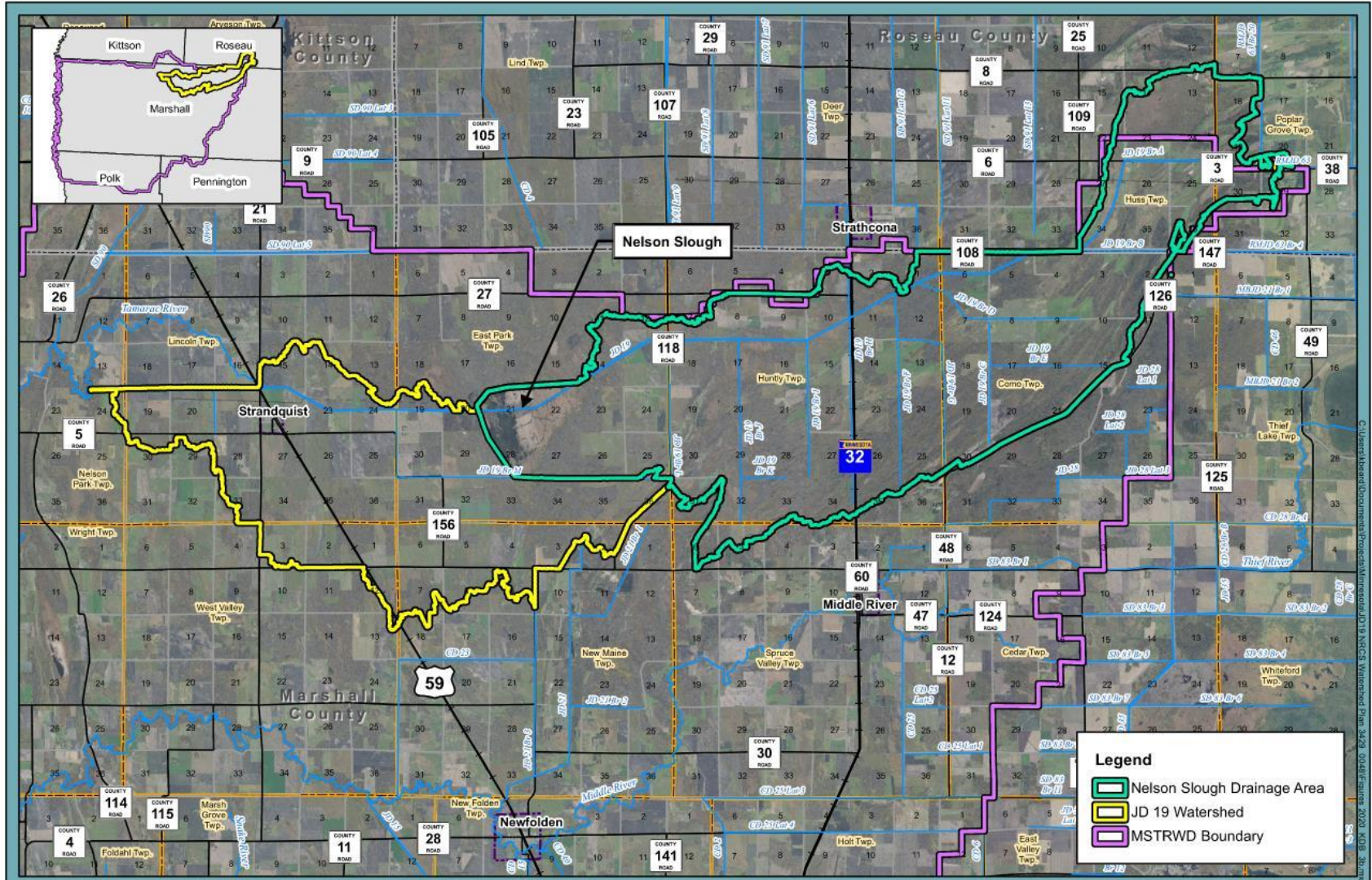


Middle-Snake-Tamarac Rivers Watershed District Nelson Slough Improvement Project Project Team and Landowner Meeting

November 10, 2021

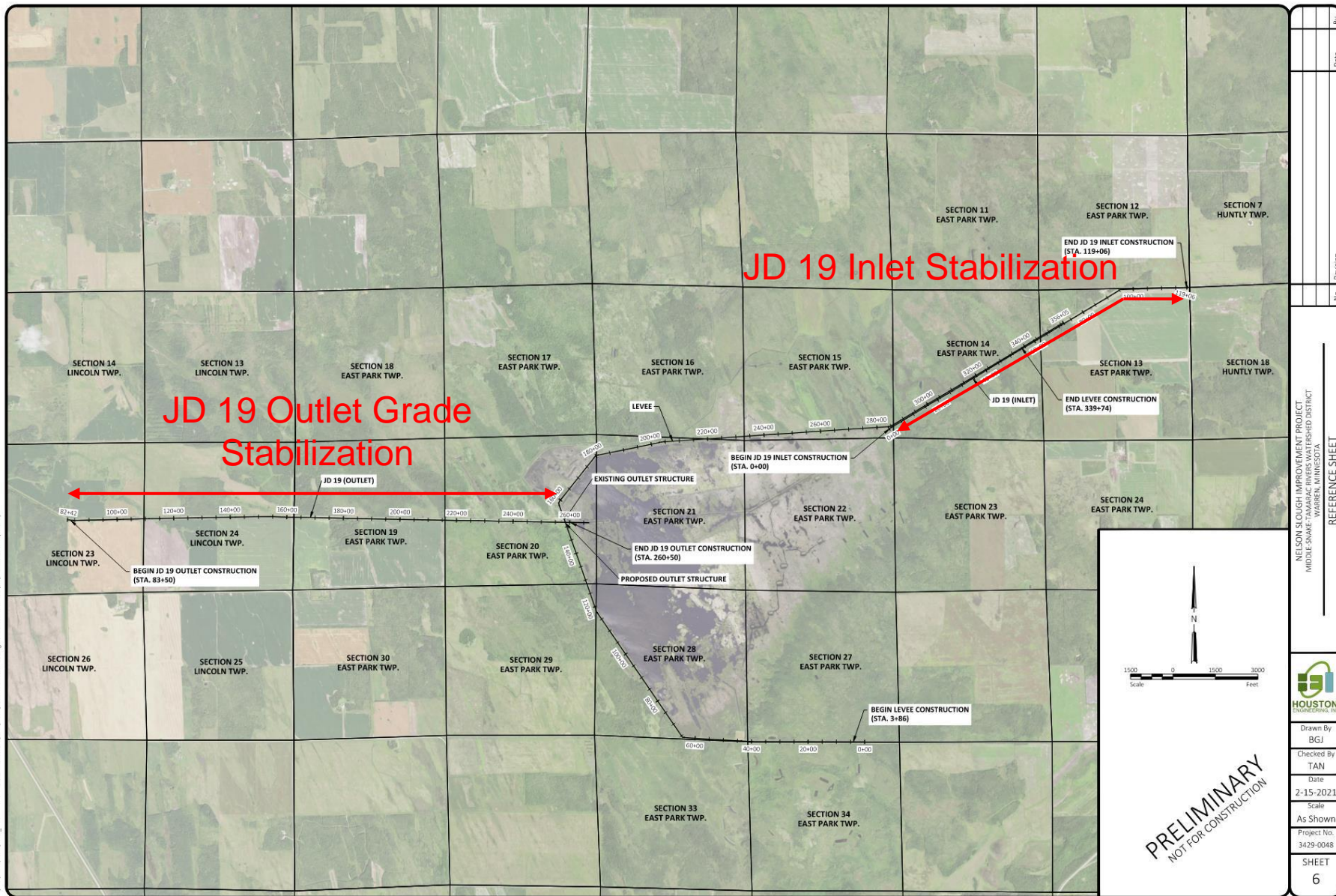


PROJECT BACKGROUND



- Tamarac Project Team – 2013 - 2015
 - Trying to identify flood damage reduction project alternatives within Tamarac Sub-watershed
- Judicial Ditch (JD) #19 Watershed Planning October 2016 - Present
 - Regional Conservation Partnership Program (RCPP)
- Project Purpose
 - Provide flood damage reduction to agricultural lands/public transportation infrastructure
 - 20% Red River Reduction Goals
- 7 Alternatives were Screened for Detail Review
- Multiple meetings with DNR & Project Team for site improvement plan
- Alternative 7 identified at Feb. 20, 2020, Project Team Meeting as the Preferred Alternative – Nelson Slough Improvement Project
 - Existing FDR/wildlife habitat structure operated by DNR – constructed in 1971
 - Old RCPP Project – NRCS 50-year project life ended September 2021
 - Existing outlet structure and operation plan doesn't allow site to operate as outlined in O&M Plan

Project Site Map

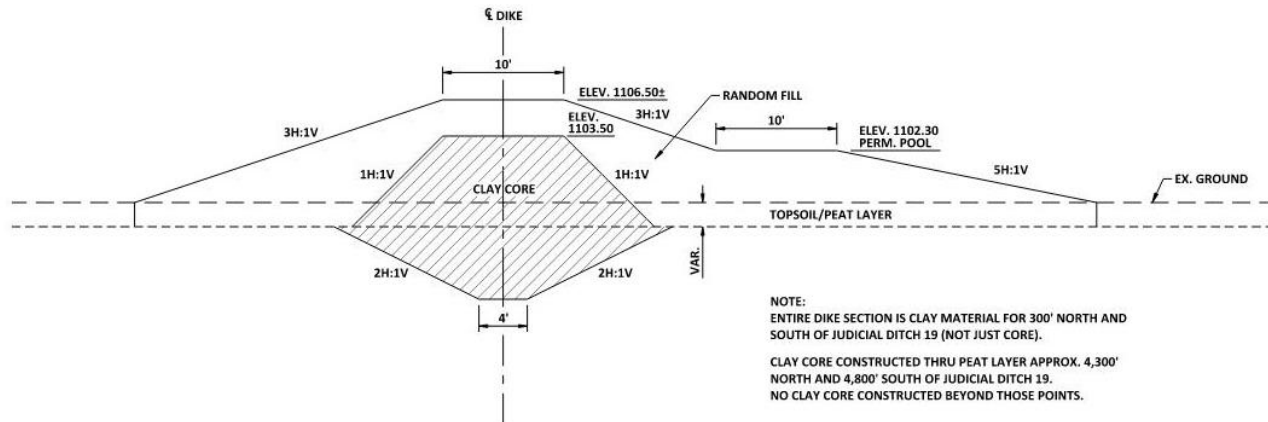


No.	Revision	Date	By
NELSON SLOUGH IMPROVEMENT PROJECT MIDDLE-SHAPE-TAMAARAC RIVERS WATERSHED DISTRICT WARREN, MINNESOTA			
REFERENCE SHEET			
Drawn By BGJ			
Checked By TAN			
Date 2-15-2021			
Scale As Shown			
Project No. 3429-0048			
SHEET 6			

PRELIMINARY
NOT FOR CONSTRUCTION

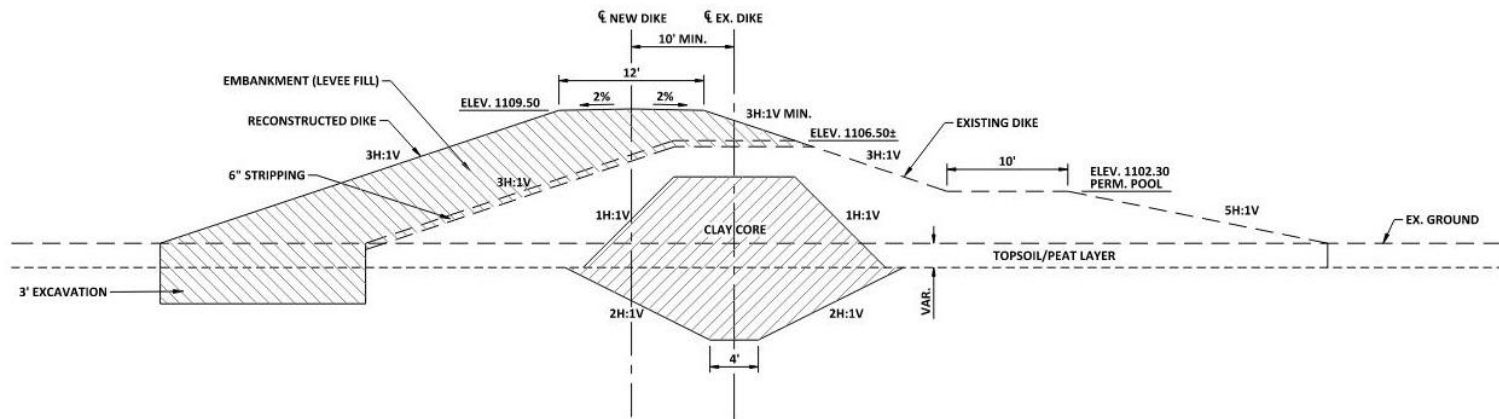
H:\WORK\3429\3429_0048_003\BNC3\Waterhead\Plan\3429\Plan\REFERENCE SHEET.dwg REFERENCE SHEET 2/15/2021 9:09 AM (buhner)

TYPICAL SECTIONS



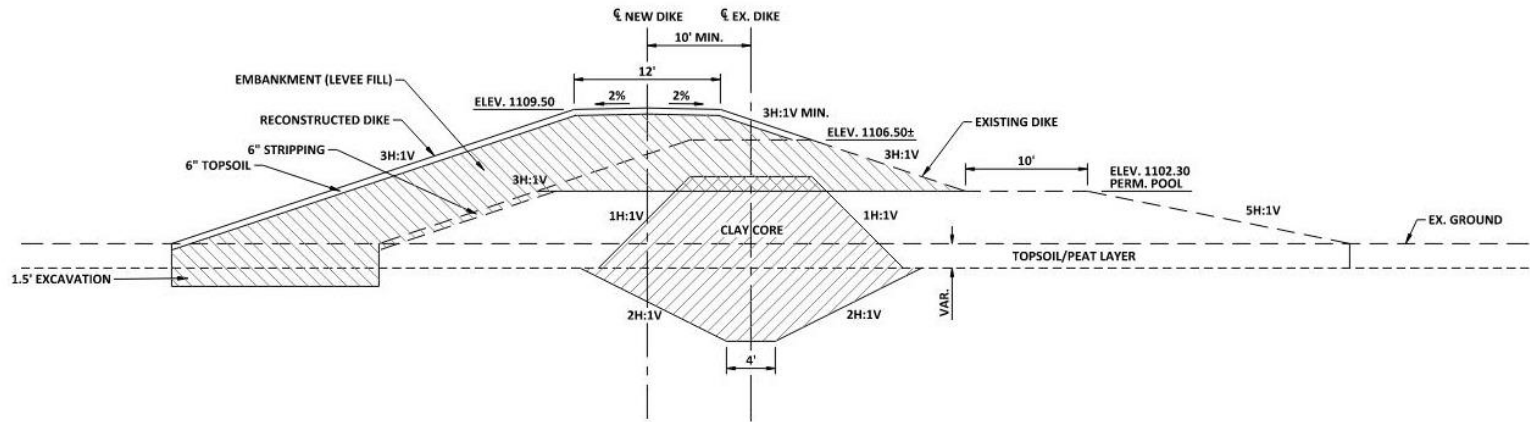
NOTE:
 ENTIRE DIKE SECTION IS CLAY MATERIAL FOR 300' NORTH AND SOUTH OF JUDICIAL DITCH 19 (NOT JUST CORE).
 CLAY CORE CONSTRUCTED THRU PEAT LAYER APPROX. 4,300' NORTH AND 4,800' SOUTH OF JUDICIAL DITCH 19.
 NO CLAY CORE CONSTRUCTED BEYOND THOSE POINTS.

TYPICAL SECTION - EXISTING DIKE
 NOT TO SCALE



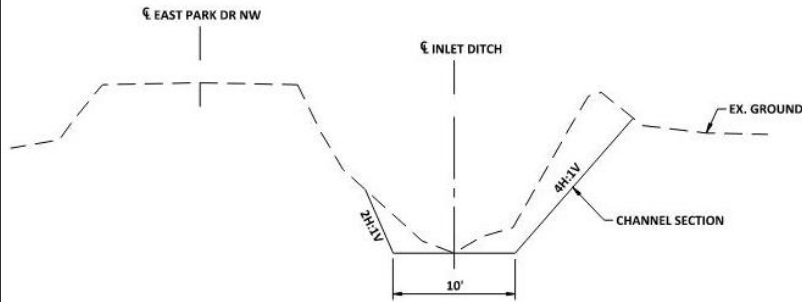
TYPICAL SECTION - RECONSTRUCTED DIKE
 NOT TO SCALE - STA 23+00 TO STA 196+00

TYPICAL SECTIONS



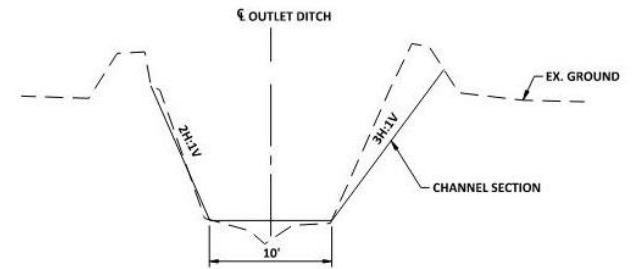
TYPICAL SECTION - RECONSTRUCTED DIKE

NOT TO SCALE - STA 196+00 TO STA 285+00



TYPICAL SECTION - JD 19 INLET CONSTRUCTION

NOT TO SCALE - STA 0+00 TO STA 119+06



TYPICAL SECTION - JD 19 OUTLET CONSTRUCTION

NOT TO SCALE - STA 83+50 TO STA 260+50

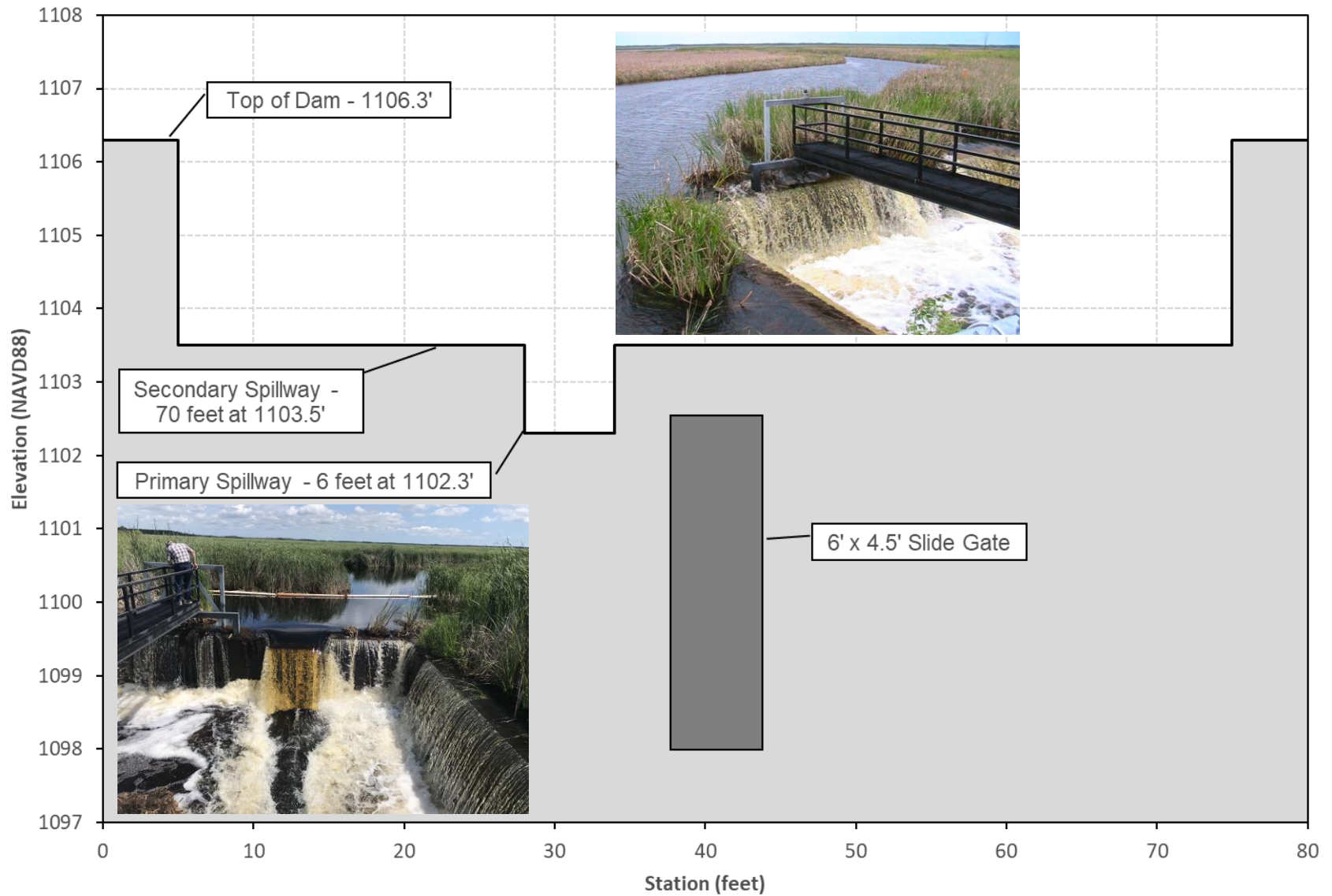
SELECTED ALTERNATIVE



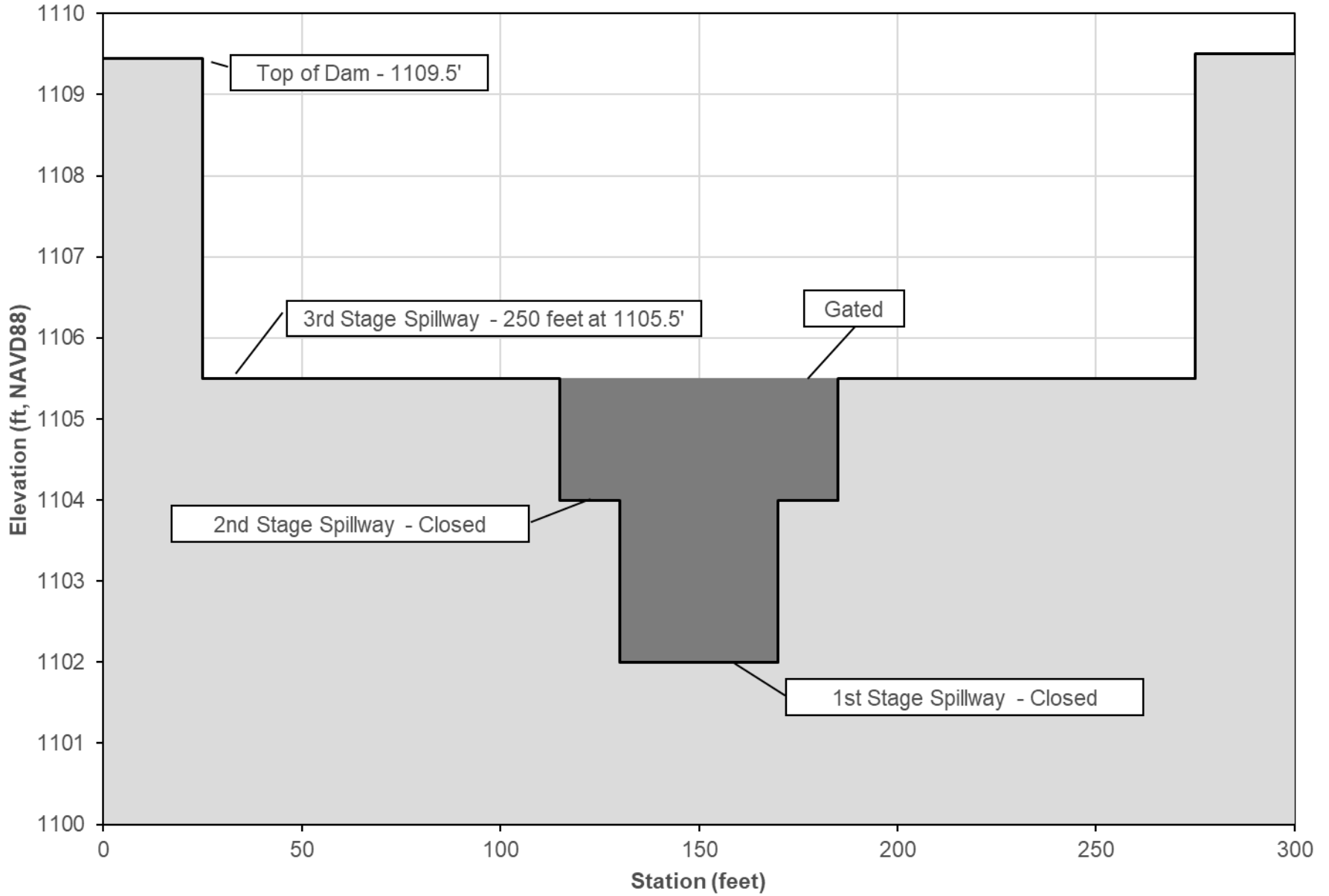
- Project Details
 - Remove Existing Outlet Structure & Construct New
 - Address Existing Levee Height – Current Dam Design Criteria (TR-60)
 - Increase from approx. 1106.0 to 1109.5
 - More Stable Summer Pool –NRE Benefit for Nesting Birds
 - Joint Operation & Maintenance Plan MSTRWD/DNR/Ditch Authority (Joint Powers Agreement)
- Operation
 - Summer/Fall Drawdown to 1102.3 (Current Identified Normal Pool Elevation)
 - Existing levels operate closer to 1103.5 minimizing existing FDR benefit
 - Summer Gated Storage 1104.0 (3,690 acre-feet, 1.0” runoff)
 - Spring Gated Storage 1105.5 (6,840 acre-feet, 1.9” runoff)
 - Ungated Storage above 1105.5 (2,712 acre-feet, 0.7” runoff)
 - Drainage Area 68.6 sq. mi.
- Outlet Channel Grade Stabilization
 - Rock Drop Structures (Regrade Ditch Bottom)
 - South Bank 3H:1V
- Inlet Channel Slope Stability
 - South Bank 4H:1V (Minimal Work Within Ditch Bottom)



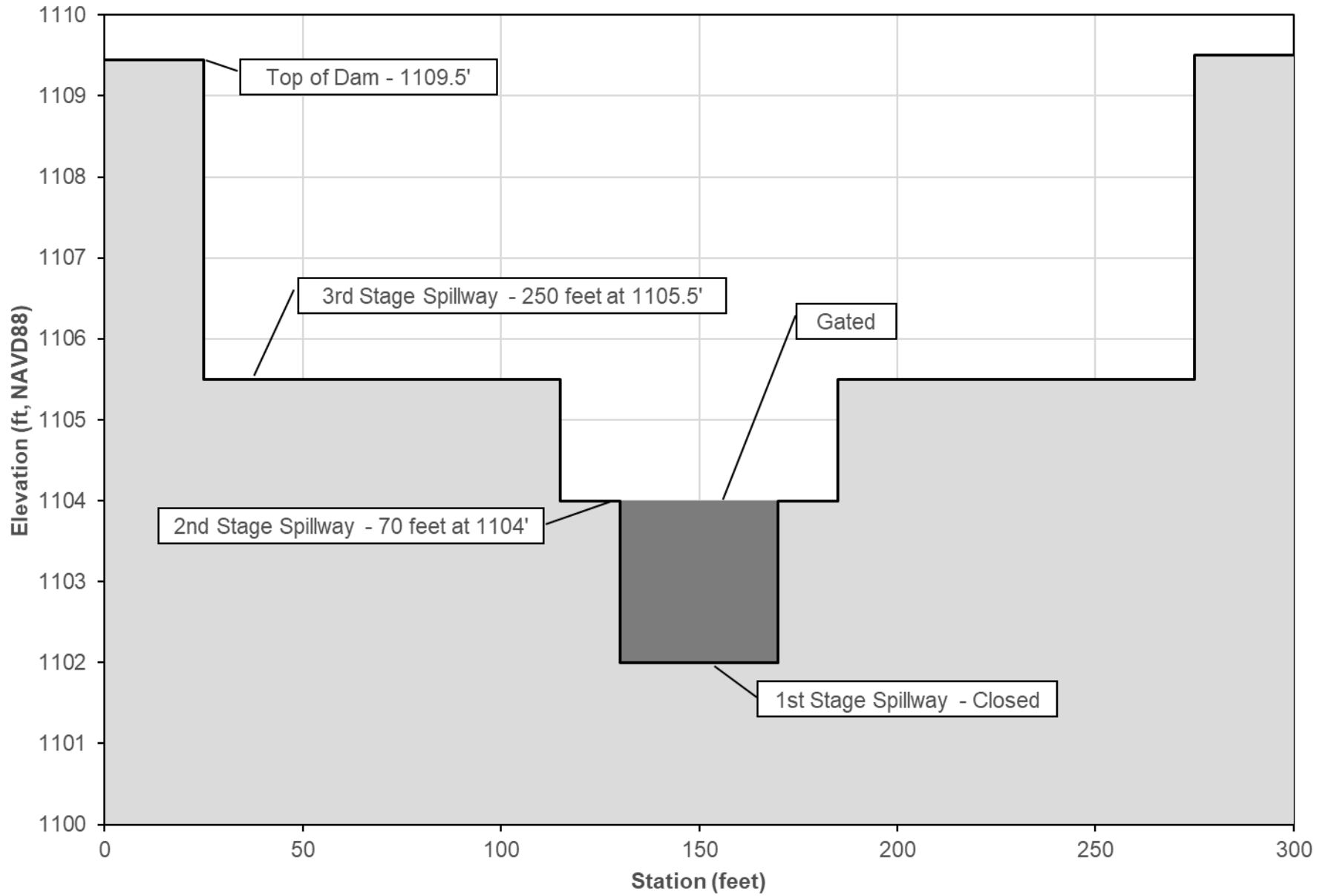
Nelson Slough Outlet Structure Profile - As-Built / Existing Condition



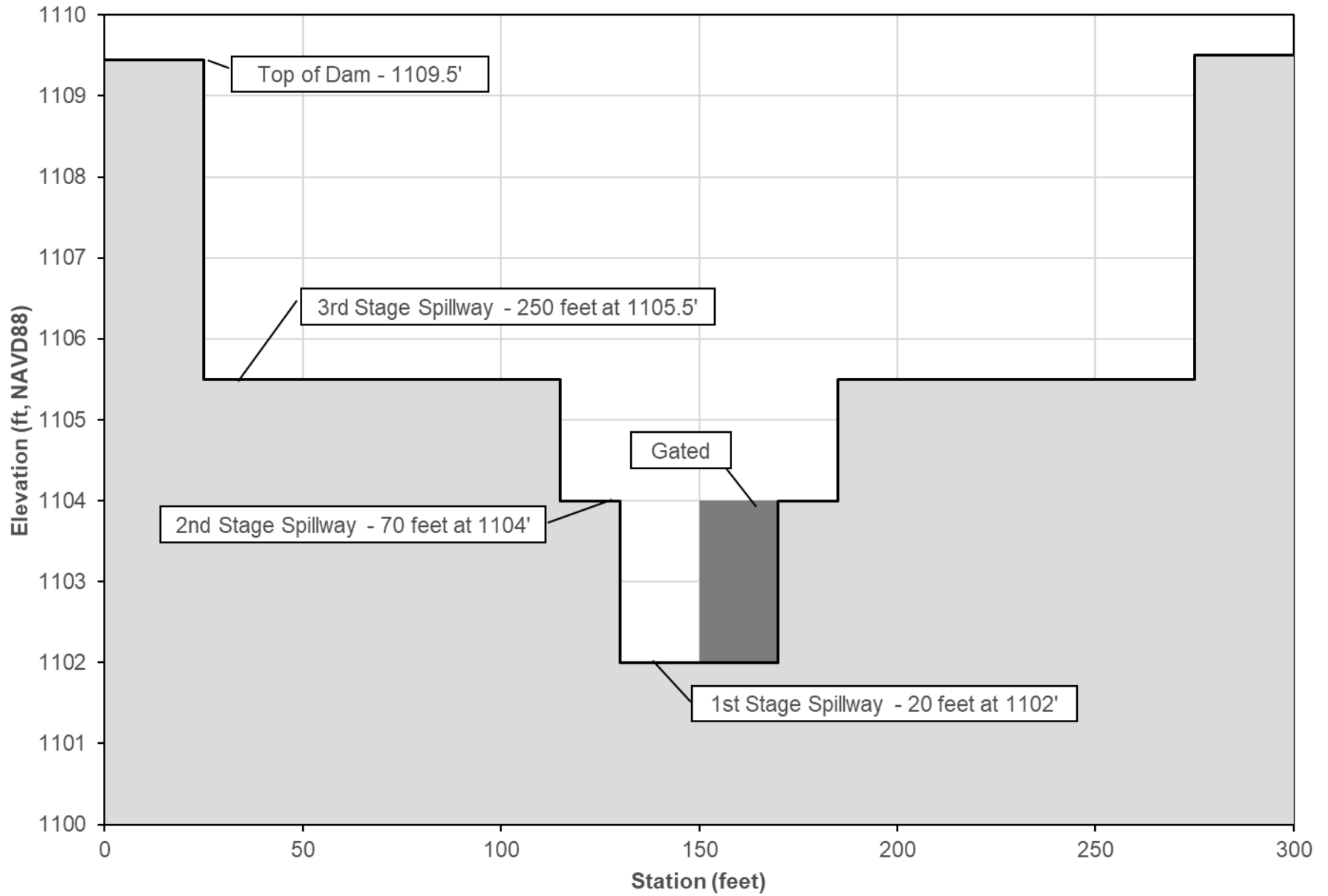
Nelson Slough Proposed Spring Configuration



Nelson Slough Proposed Summer Configuration - With Operation



Nelson Slough Proposed Summer Configuration - No Operation



Proposed Outlet Structure



DNR REAL ESTATE MANAGEMENT

SECTION 20
EAST PARK TWP.

JD 19 OUTLET

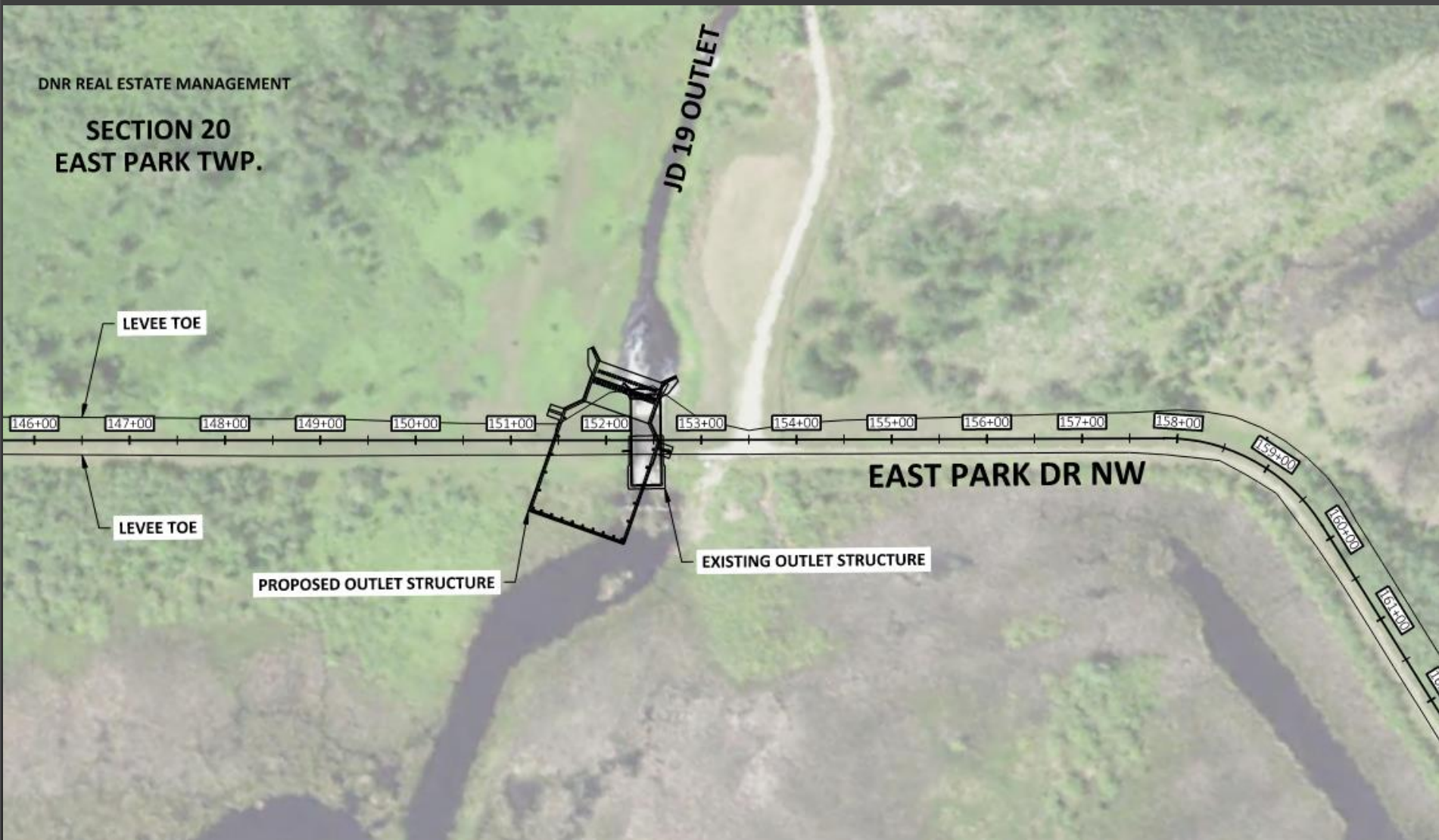
LEVEE TOE

LEVEE TOE

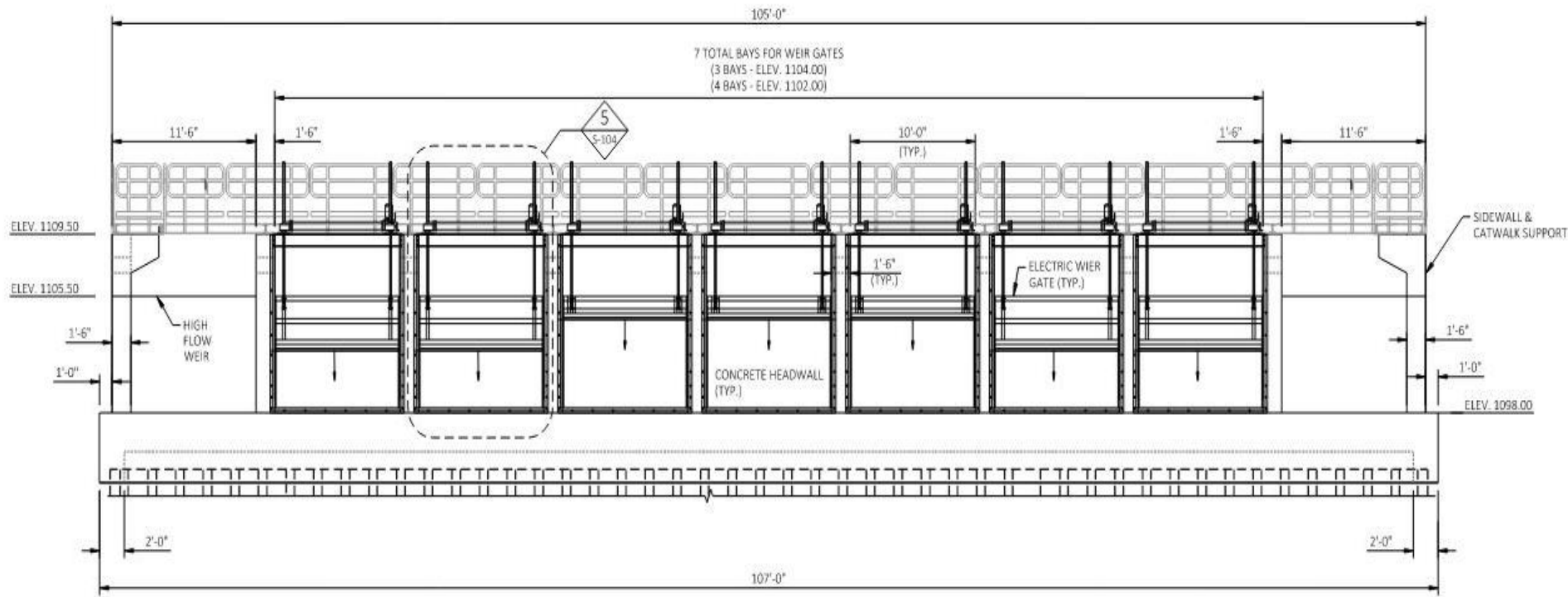
PROPOSED OUTLET STRUCTURE

EXISTING OUTLET STRUCTURE

EAST PARK DR NW



Proposed Outlet Structure



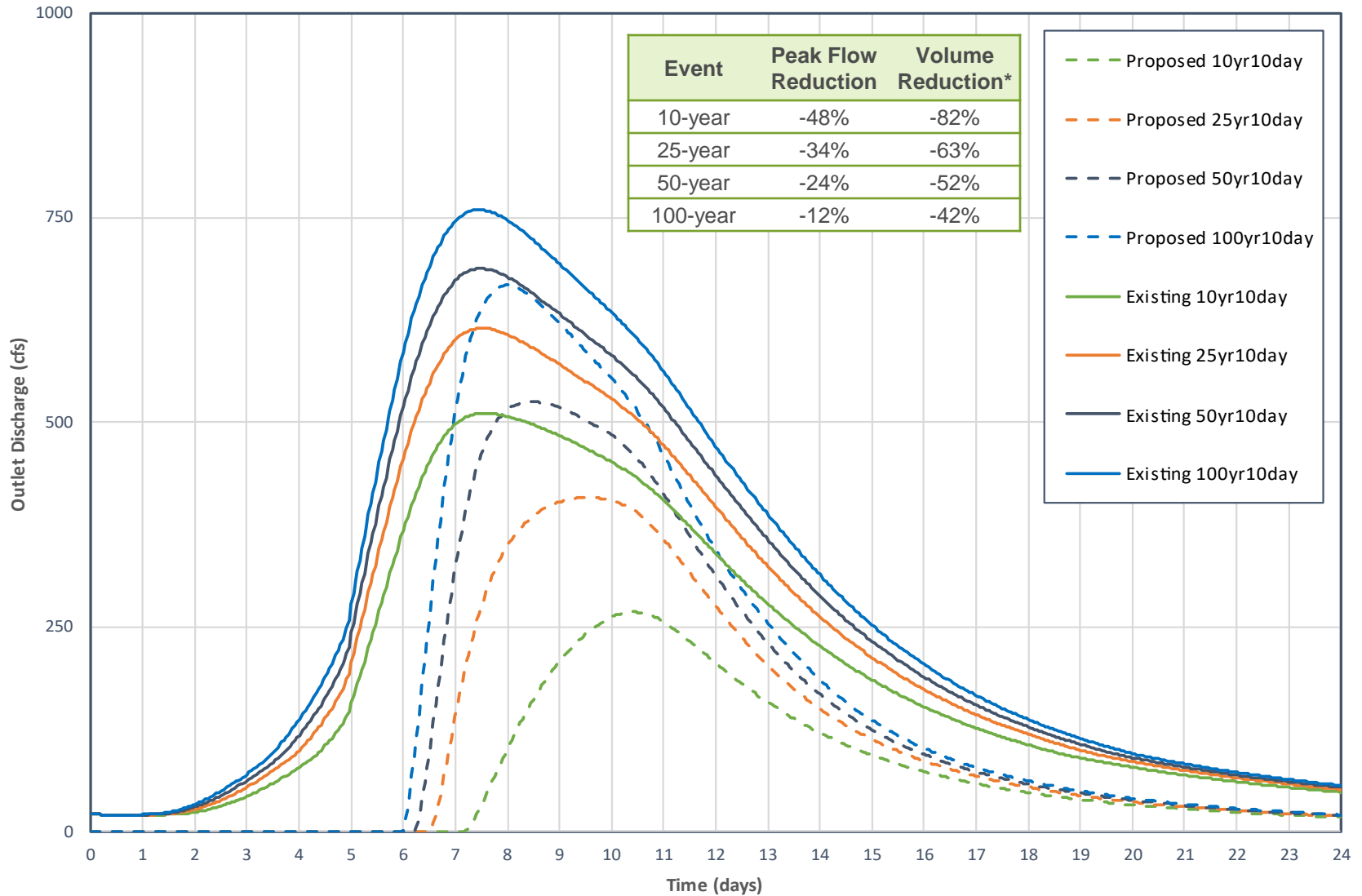
1 FRONT WALL DETAIL

NOTE:
TRASH RACK OMITTED FOR CLARITY.





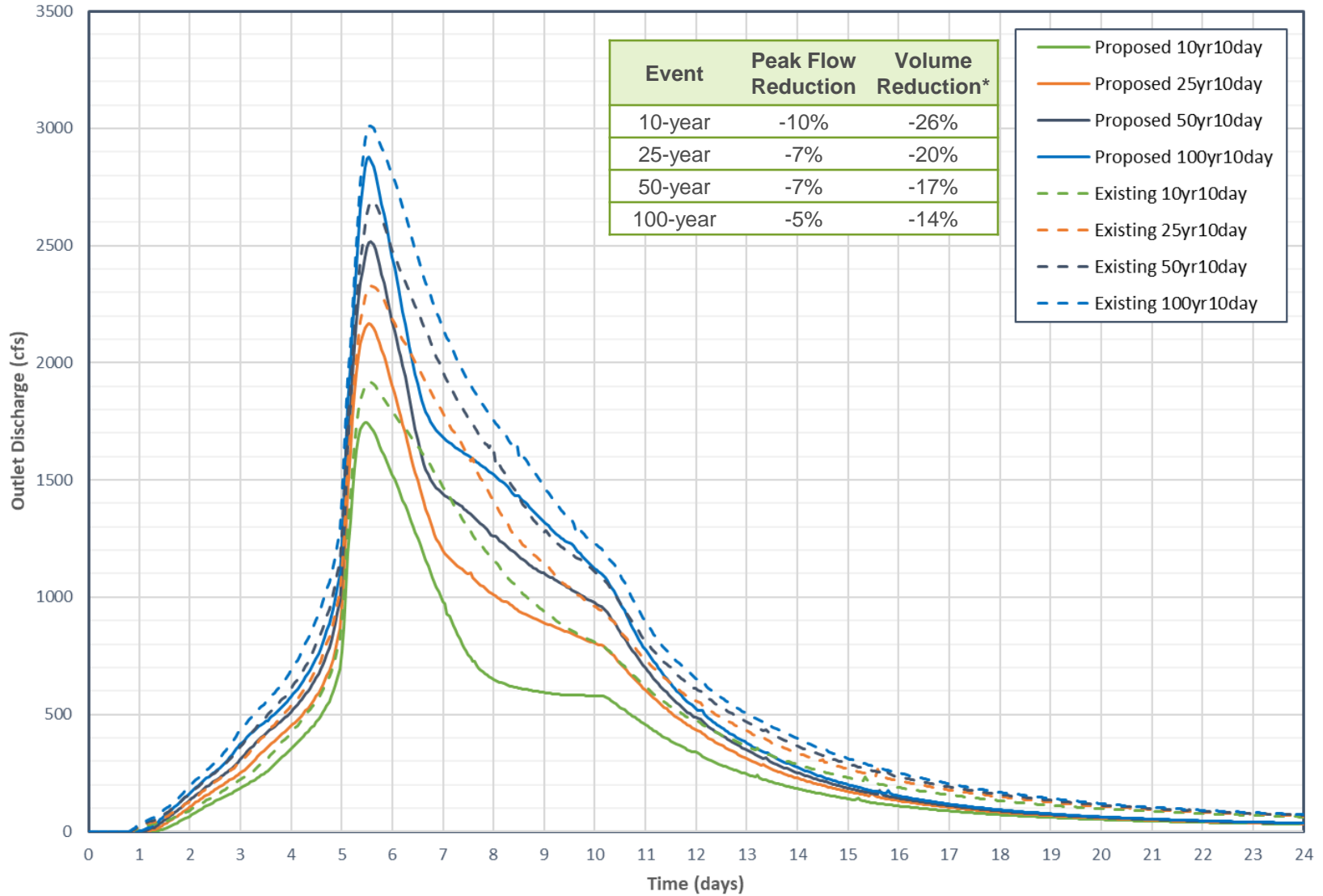
Spring 10-day Runoff Events | Nelson Slough Discharge



*Volume Reduction is for time window shown, storage volume will need to be released after the event



Spring 10-day Runoff Events | JD 19 Outlet

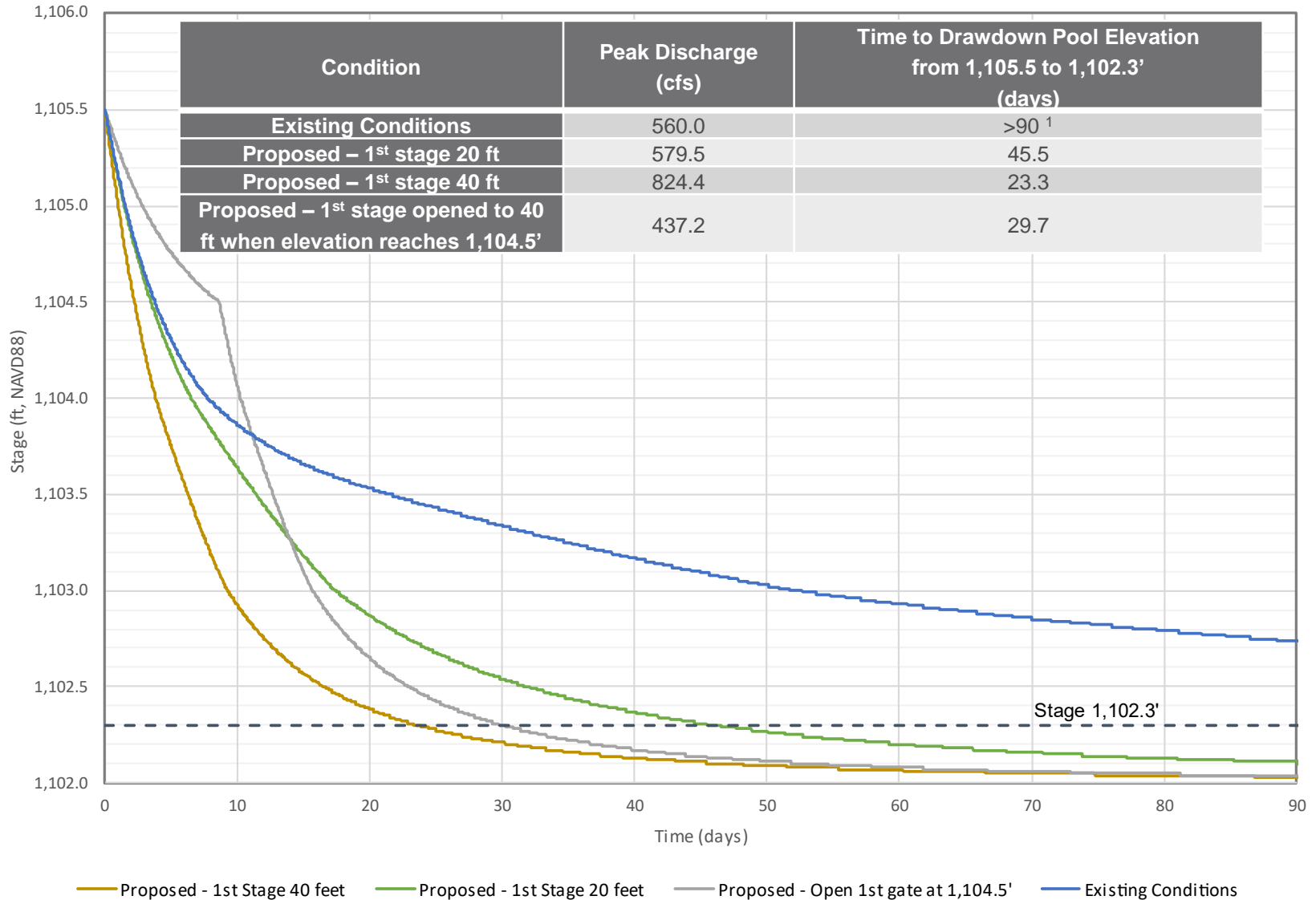


*Volume Reduction is for time window shown, storage volume will need to be released after the event



DRAWDOWN

Nelson Slough Site Drawdown Comparison



PROJECT BENEFITS



▪ Flood Damage Reduction Benefits

- Meets the Purpose and Need for the majority of Sub-Watershed
- Inlet channel slope stability will allow flows more efficiently into the project site
- Downstream grade stabilization will minimize erosion and provide stable outlet
- Provides the largest gated storage capacity of the alternatives
- Increase Flood Storage within Nelson Slough Site
- Reduce peak flows downstream during high water conditions on JD 19, Tamarac River, Red River of the North
- Efficient Outlet – more control when releasing and storing water
- Minimize the constant flows in late fall and winter – freezing culverts, ditches, etc...
- Address Existing Freeboard Concerns with Nelson Slough (Levee Height)

PROJECT BENEFITS



▪ **Natural Resource Enhancement Benefits**

- Efficient outlet structure will minimize bounce on non-operating summer events
- Provide faster drawdown time during operated summer events
- More stable water levels for nesting birds
- More stable winter water levels for furbearers
- Improve opportunity for public to view wildlife, hunting, trapping, and other outdoor activities
- Provide more open water – reduced hybrid cattail with strategic borrow pit locations
- Periodic temporary full drawdowns – diversify aquatic vegetation, improve water quality, and increase invertebrate abundance

Project Cost



- Total Project Cost = \$8,333,000
- MN FHM = \$4,166,500
- RRWMB Cost = \$2,777,667
- Local Cost = \$1,388,833

- Cost Breakdown Based On
 - 50% State FDR
 - 33% RRWMB
 - 17% Local Cost
- NRE's – Higher State Share (Likely 65% to 70%)
- DNR – Other Funding Sources
- Local Cost – Potential Pots of Money
 - MSTRWD Project Funds, 1W1P, Clean water grants, RRWMB Water Quality Funding

Draft Operation



- Currently working with DNR staff on drafting operation & maintenance plan
- Spring Operation (Typically April 1st – May 15th)
 - MSTRWD proposed to operate gates during spring thaw/runoff event
- Summer Operation (May 15th – November 15th)
 - DNR proposed to operate gates during growing/nesting season
 - 3.5 inches of rainfall would trigger summer operation of gates otherwise operated for habitat with low gate opening
 - Gates closed to 1105.5 prior to freeze up
- Outlet structure closure and openings based on downstream triggers
 - Gauge to be installed at Hwy. 59 on JD 19
 - Stephen Gauge on Tamarac River (Drawdown only)
 - Drayton Gauge on Red River of the North

Draft Maintenance



- DNR likely still day to day maintenance on Nelson Slough Impoundment
 - Mowing, graveling, cattail bogs, beaver dams, etc..
- DNR/MSTRWD joint maintenance on larger scale Nelson Slough Impoundment costs
 - Outlet structure, levee (Likely partner to seek outside funding)
- Drainage Authority proposed to be responsible for maintenance on grade and bank stabilization portion of project long term
 - Ex: Channel erosion, bank failures, beaver dams, etc..
- Annual Meeting between DNR, MSTRWD, and Drainage Authority
 - Review O&M Plan and Amend if all parties deem necessary
- Proposing a JPA between DNR, MSTRWD, & Drainage Authority



Questions

TAMARAC RIVER WATERSHED
EAST PARK FLOOD CONTROL
AND
WILDLIFE MANAGEMENT AREA

DRAINAGE AREA	44,793	ACRES
FLOODWATER RETARDING STORAGE	1,520	ACRE FEET
STORAGE FOR WILDLIFE PURPOSE	3,329	ACRE FEET
WATER SURFACE AREA	1,720	ACRES
HEIGHT OF FILL	15	FEET
VOLUME OF FILL	236,000	CU YD. MIN.

BUILT UNDER THE WATERSHED PROTECTION
AND FLOOD PREVENTION ACT

MARSHALL COUNTY BOARD OF COMMISSIONERS
MARSHALL COUNTY SOIL AND WATER CONSERVATION DISTRICT
MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GAME AND FISH
AND
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
1971

