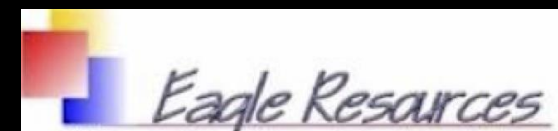


GROUNDWATER CONSTRAINTS TO DEVELOPING A FORMER BROWNFIELDS SITE AS A REGIONAL PARK

SOIL SCIENCE SOCIETY OF NORTH CAROLINA

JANUARY 23, 2019



DECEMBER 2002


STORAGE OF BULK MATERIALS

- CALCIUM NITRATE
- CHROMIUM ORE
- POTASSIUM NITRATE
- EVAPORATED SALT
- SOLAR SALT
- NITRATE OF SODA
- NITRATE OF SODA POTASH
- SULPHATE OF POTASH
- UREA
- LIME
- SULFUR
- AMMONIUM NITRATE FERTILIZER
- ZIRCON SAND



Image © 2018 New Hanover County, NC

Google Earth

Eagle Resources

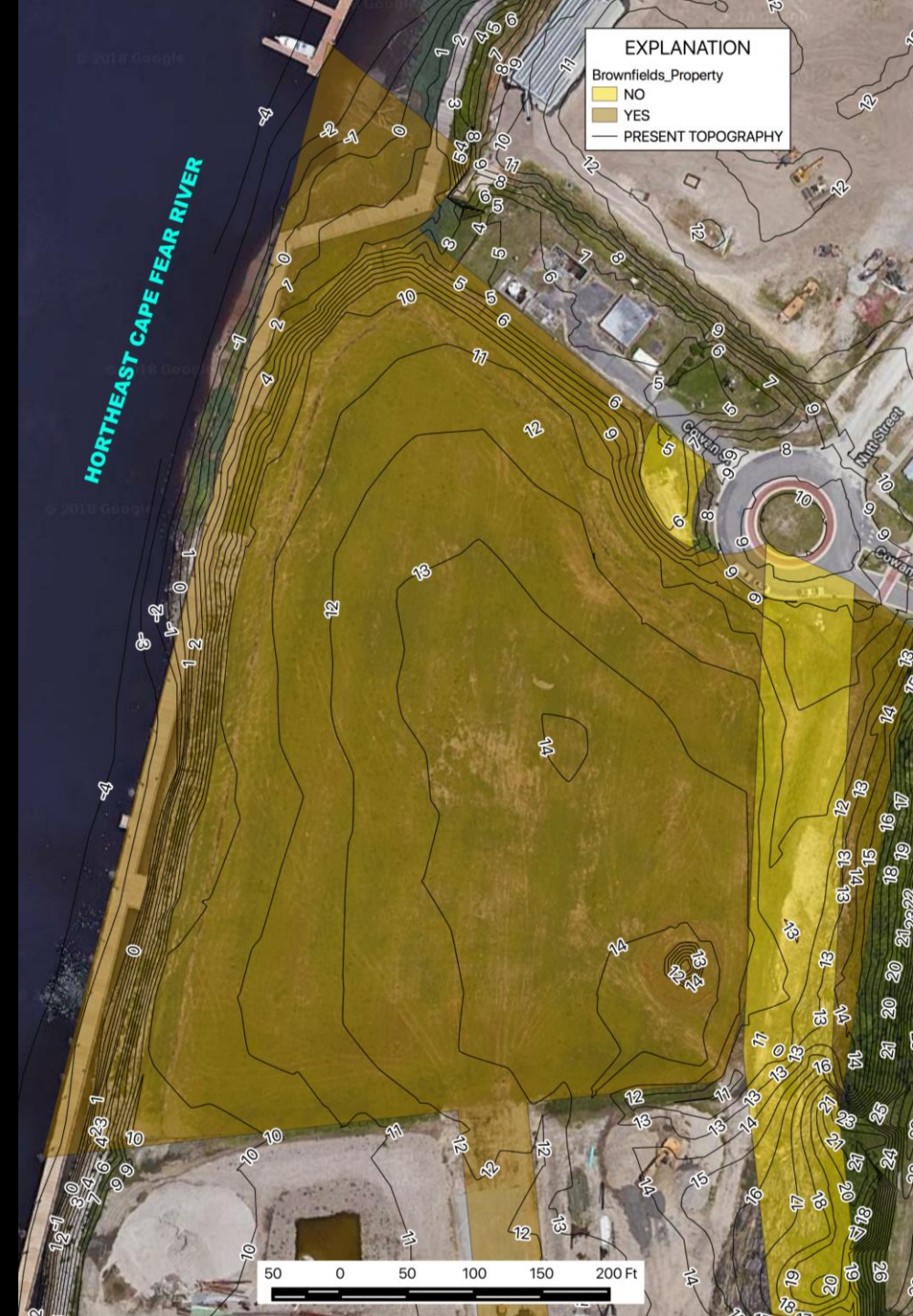
JANUARY 2013

MATERIAL DREDGED FROM MARINA



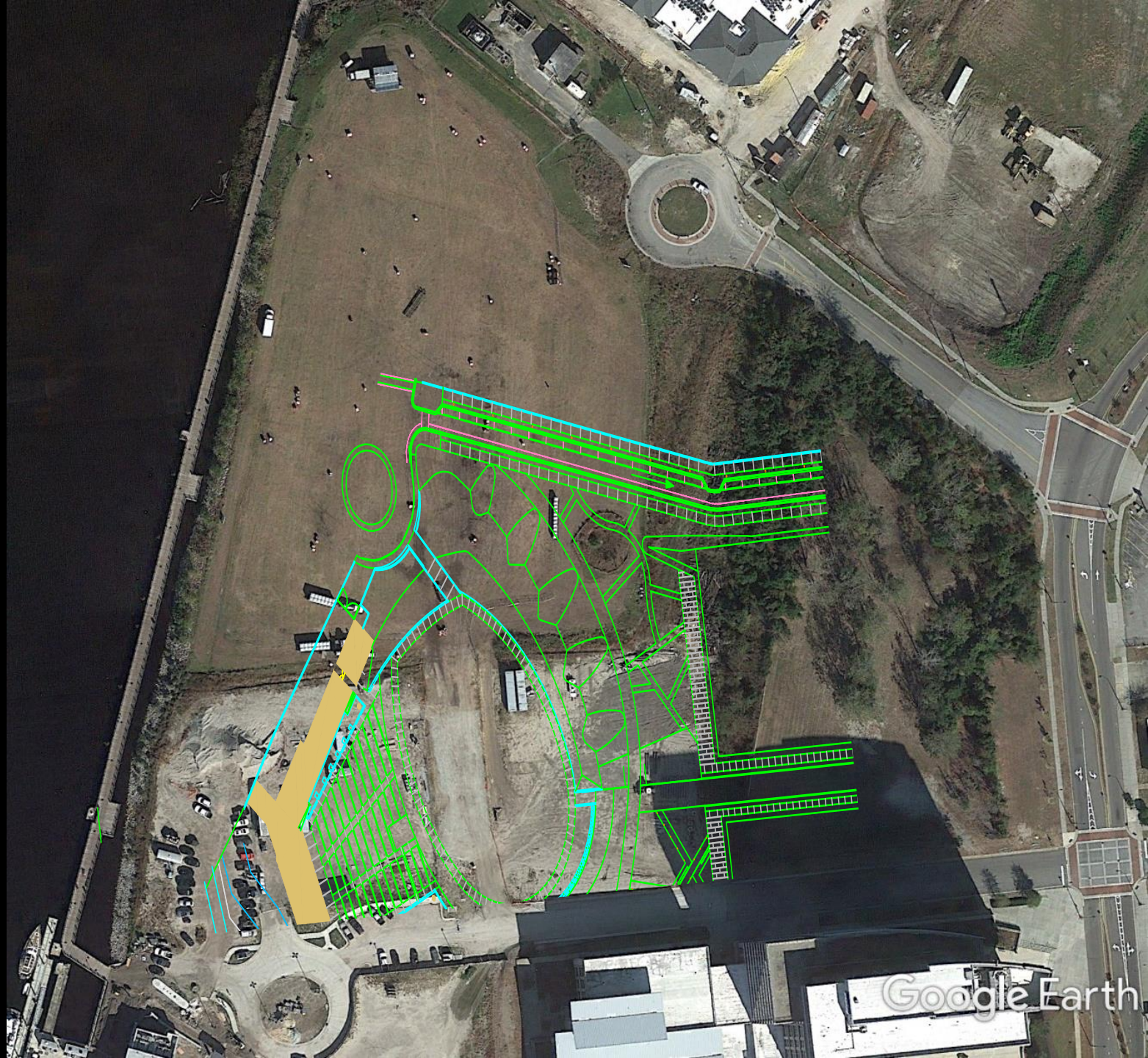
JUNE 2015

- **BROWNFIELDS SITE STATUS**
- **4 – 10 FEET DREDGE MATERIAL**
- **GRADED**
- **2 FT CLEAN COVER**
 - **SAND AND PLANTING MATERIAL**
 - **BROWNFIELDS REQUIREMENT**
- **PLANTED TO GRASS**
- **DEVELOPMENT RESTRICTIONS**



PROPOSED PARK

- RIVER WALK ACCESS
- WALKWAYS
- PERFORMANCE STAGE
- GREAT LAWN



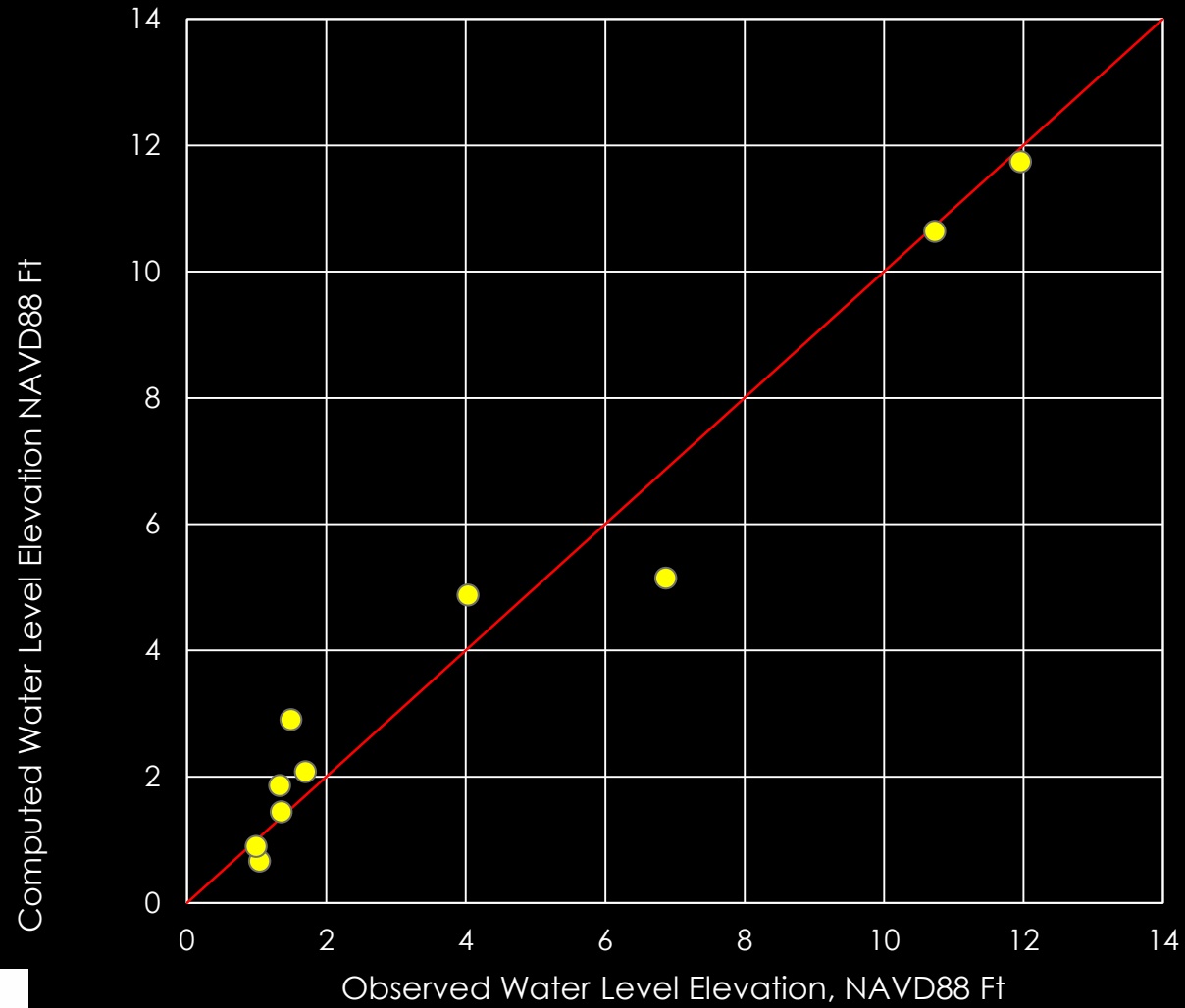
Google Earth

SITE INVESTIGATIONS

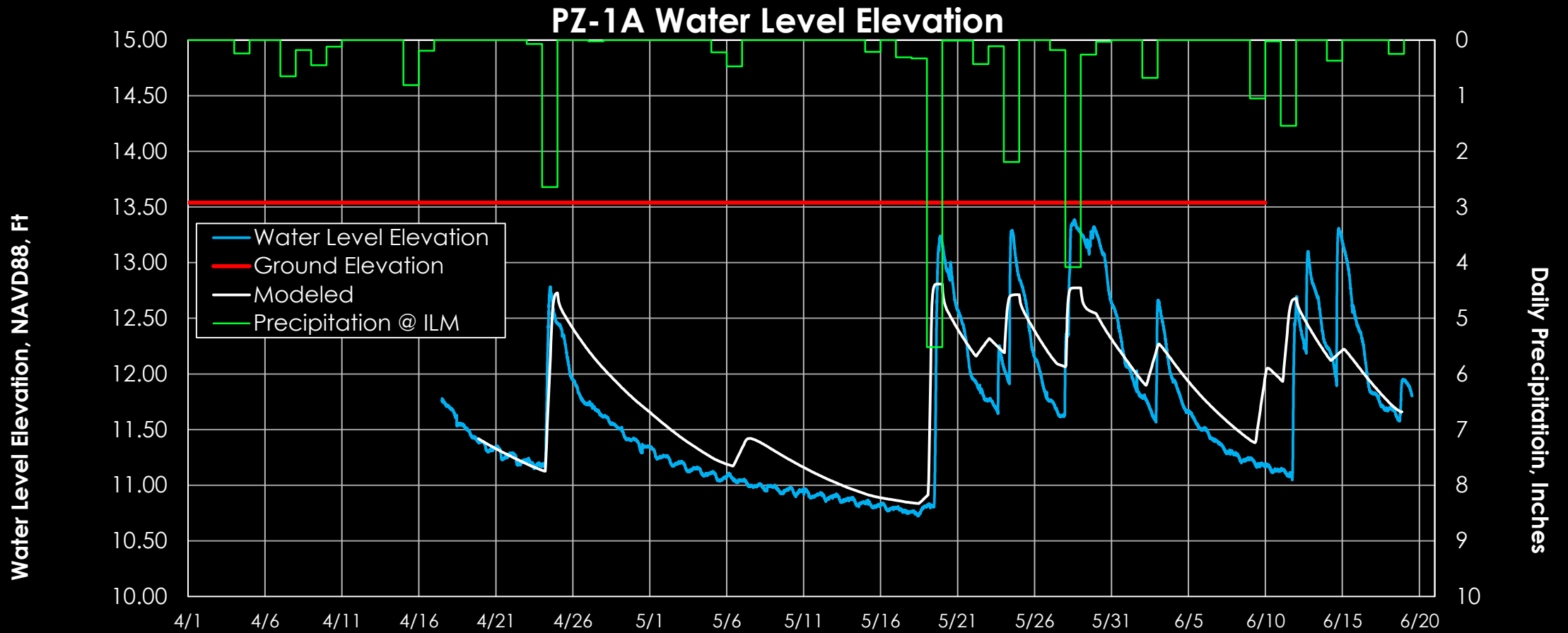
- **PIEZOMETERS TO BASE OF FILL**
 - GEOPROBE CORES
 - SCREENED 2-3 FT - 1
 - SCREENED 4 – 6 FT -1
 - SCREENED 9 – 12 FT – 8
 - SLUG TESTS
 - WATER LEVELS, POINT AND RECORDING
- **CPT SOUNDINGS AND BORINGS (GEOTECHNICAL)**
- **3-D GROUNDWATER FLOW MODEL**



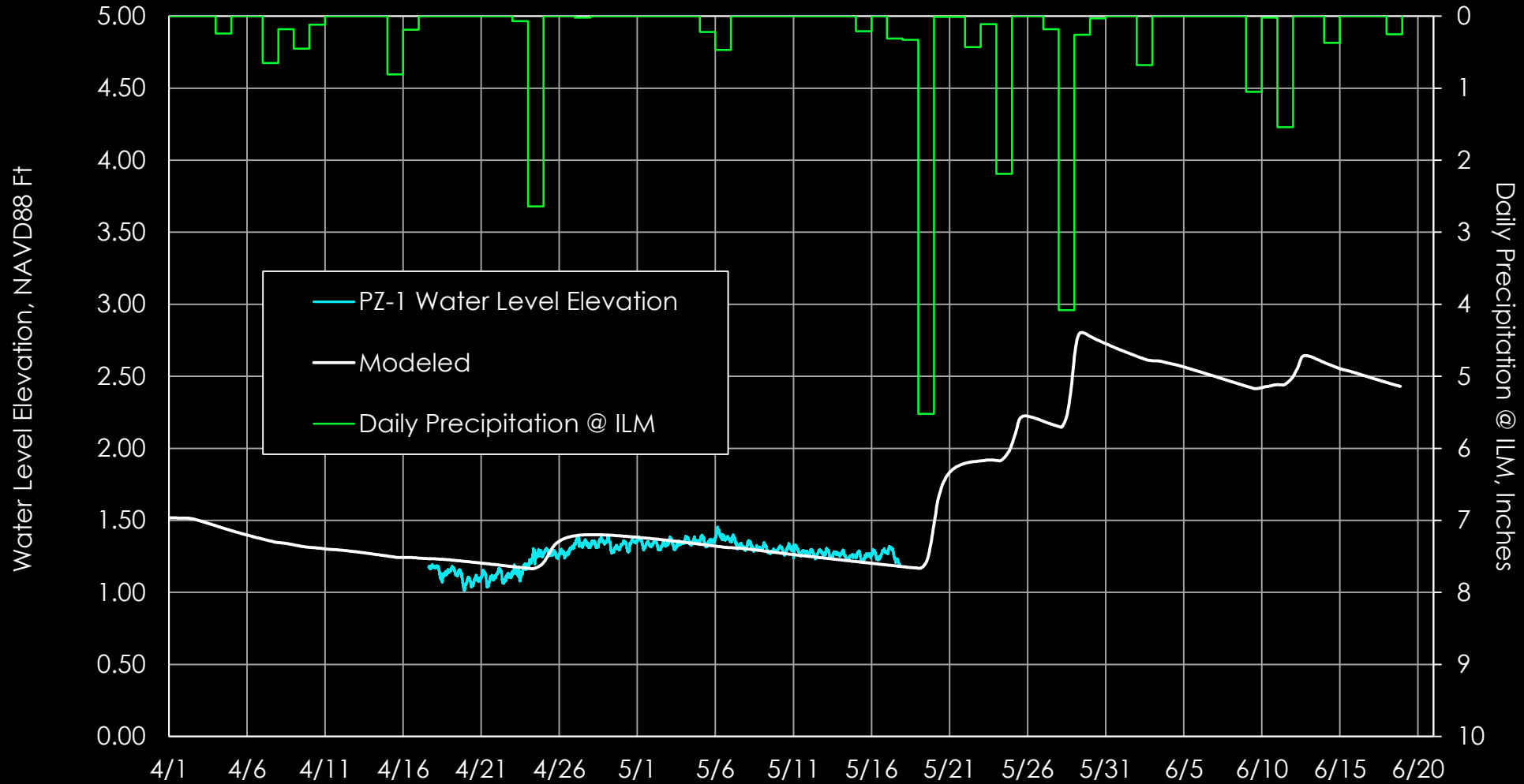
MODEL CALIBRATION



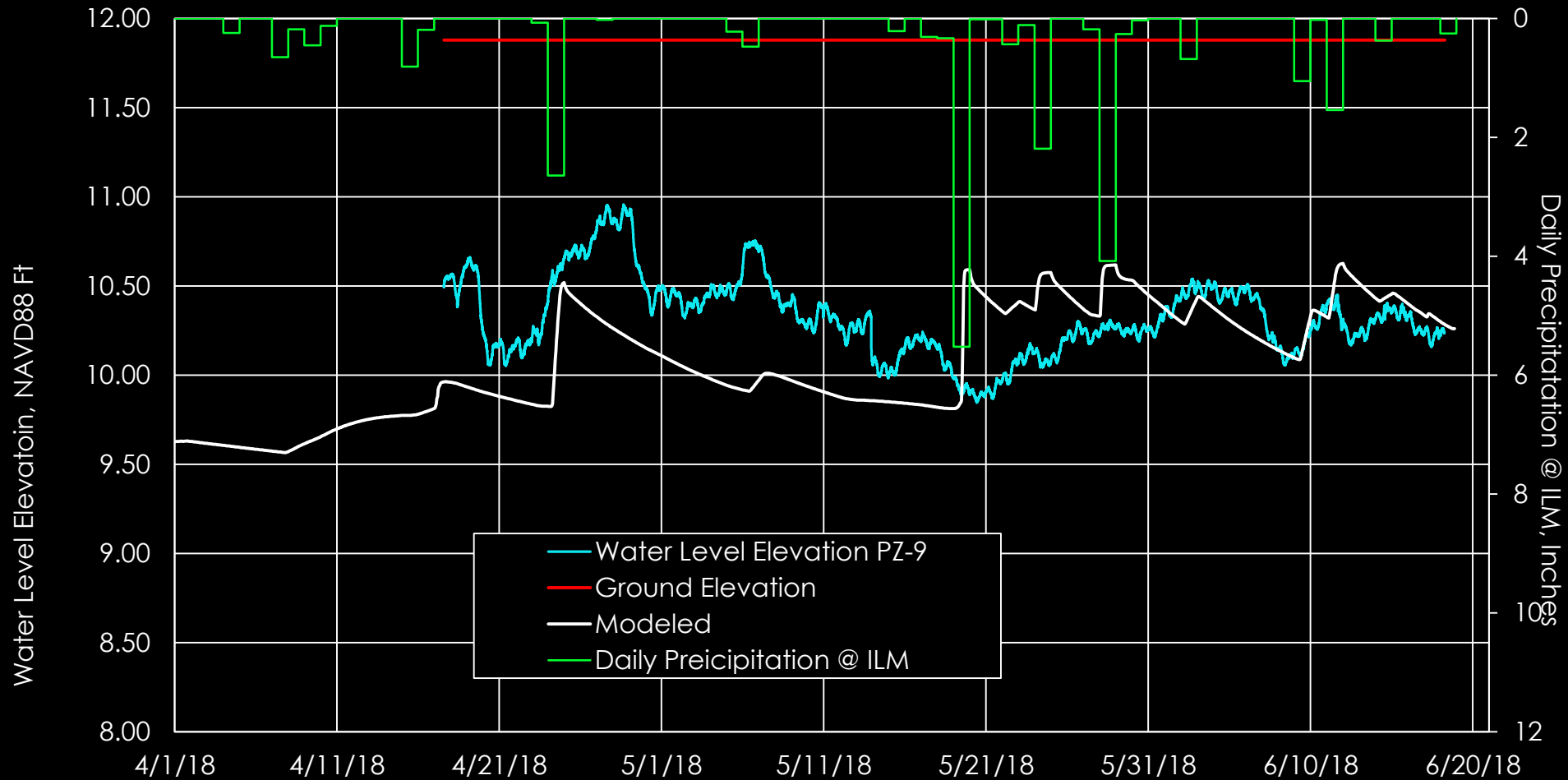
WATER LEVELS IN ON TOP OF DREGGE FILL (0 TO 3 FT)



WATER LEVELS BELOW DREDGE FILL (9 TO 10 FT)

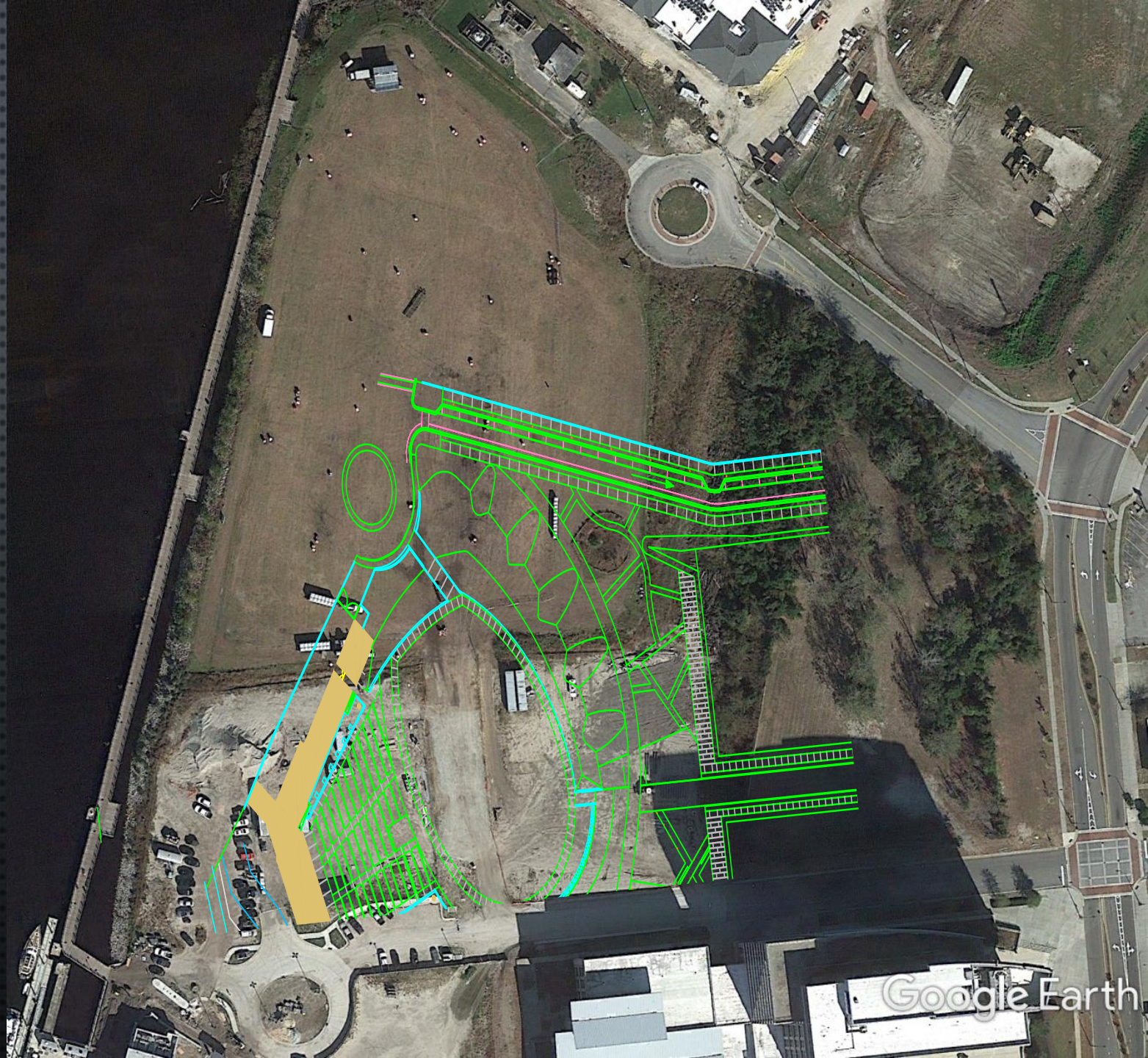


WATER LEVELS WITHIN DREDGE FILL (4 TO 6 FT)



GROUNDWATER ISSUES

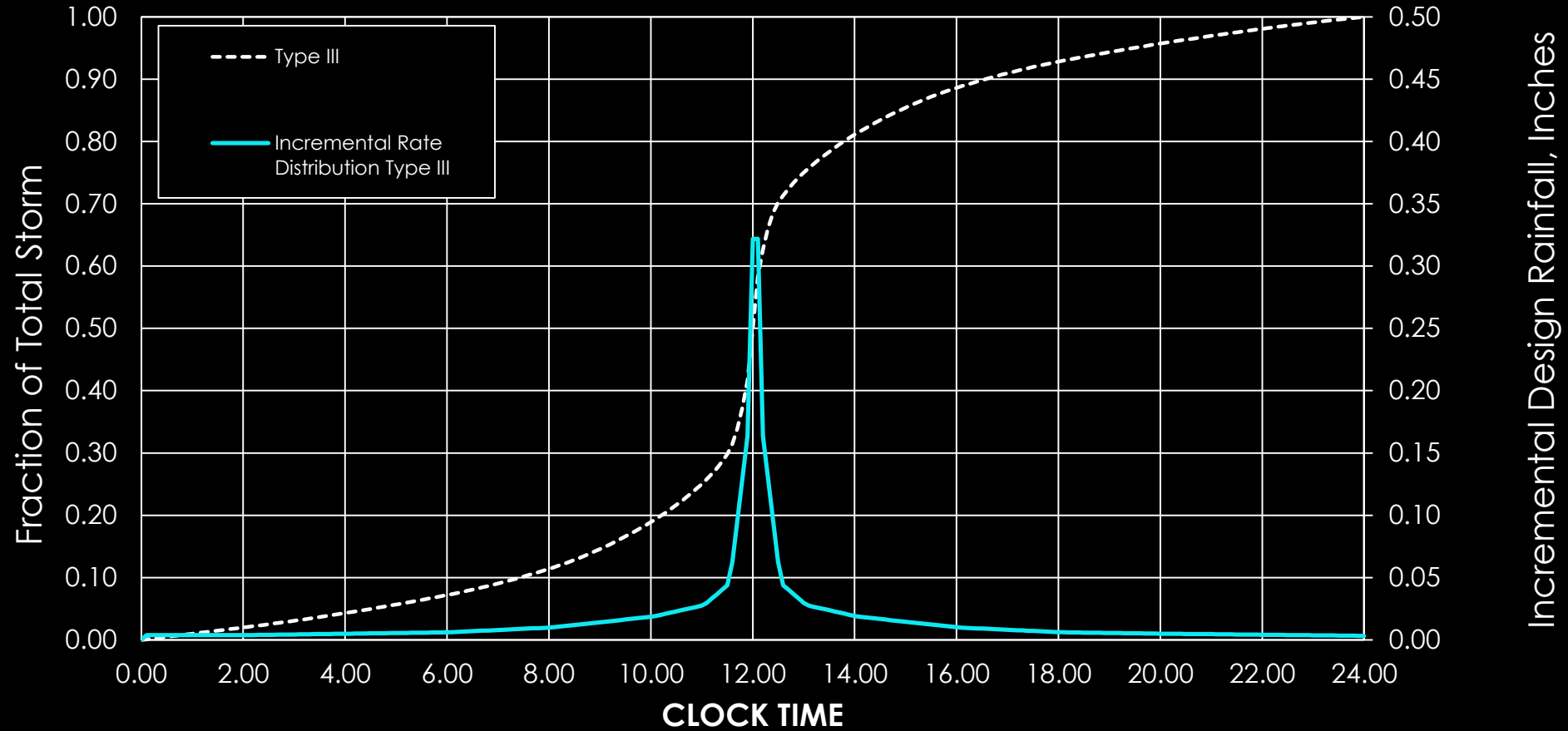
- STORMWATER MANAGEMENT
- INTERACTION WITH RIVER
- CONSTRUCTION ACTIVITIES



Google Earth

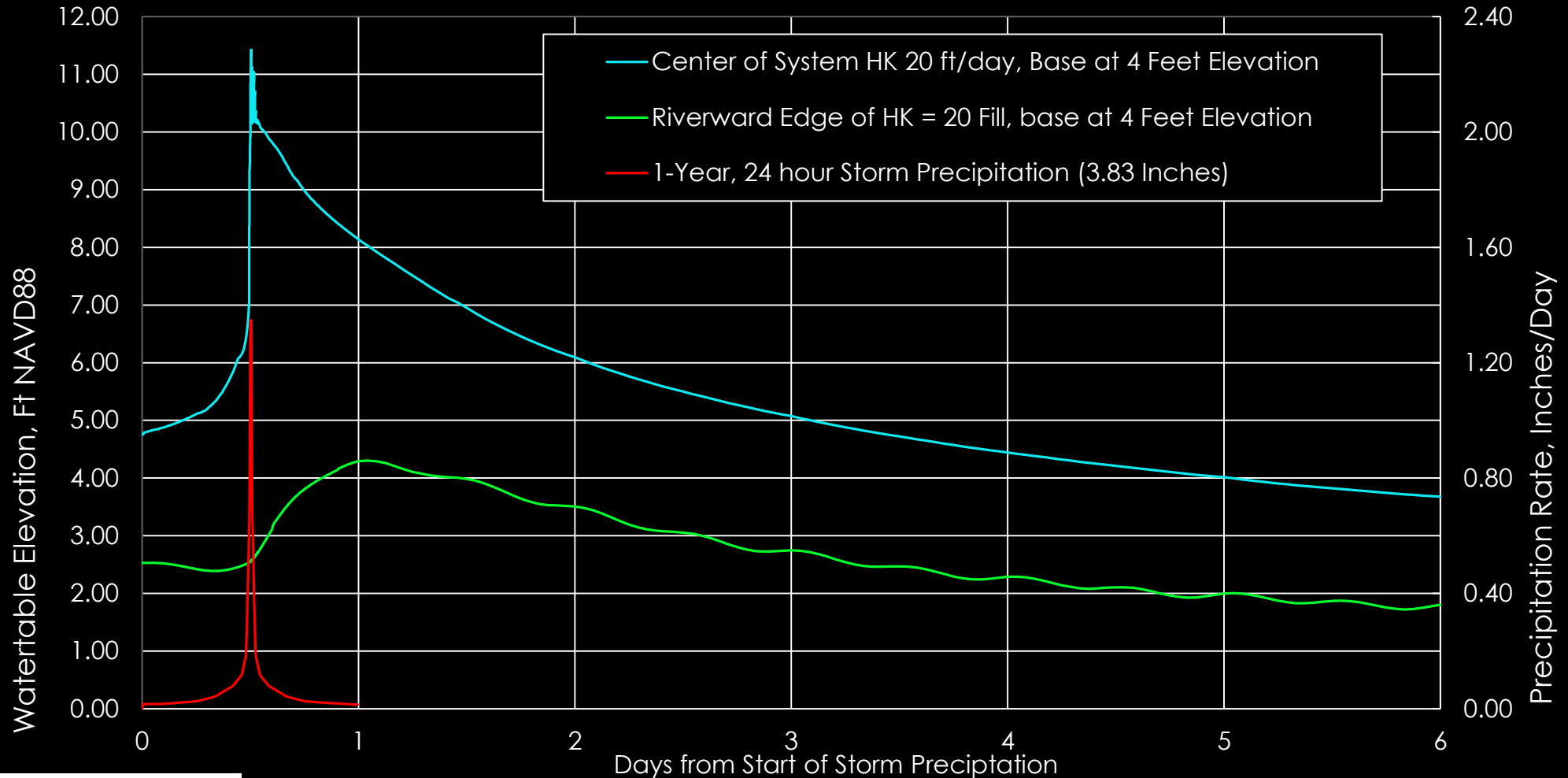
DESIGN STORM MODELED WITH GROUNDWATER MODEL

NRCS Standard Storm Distributions

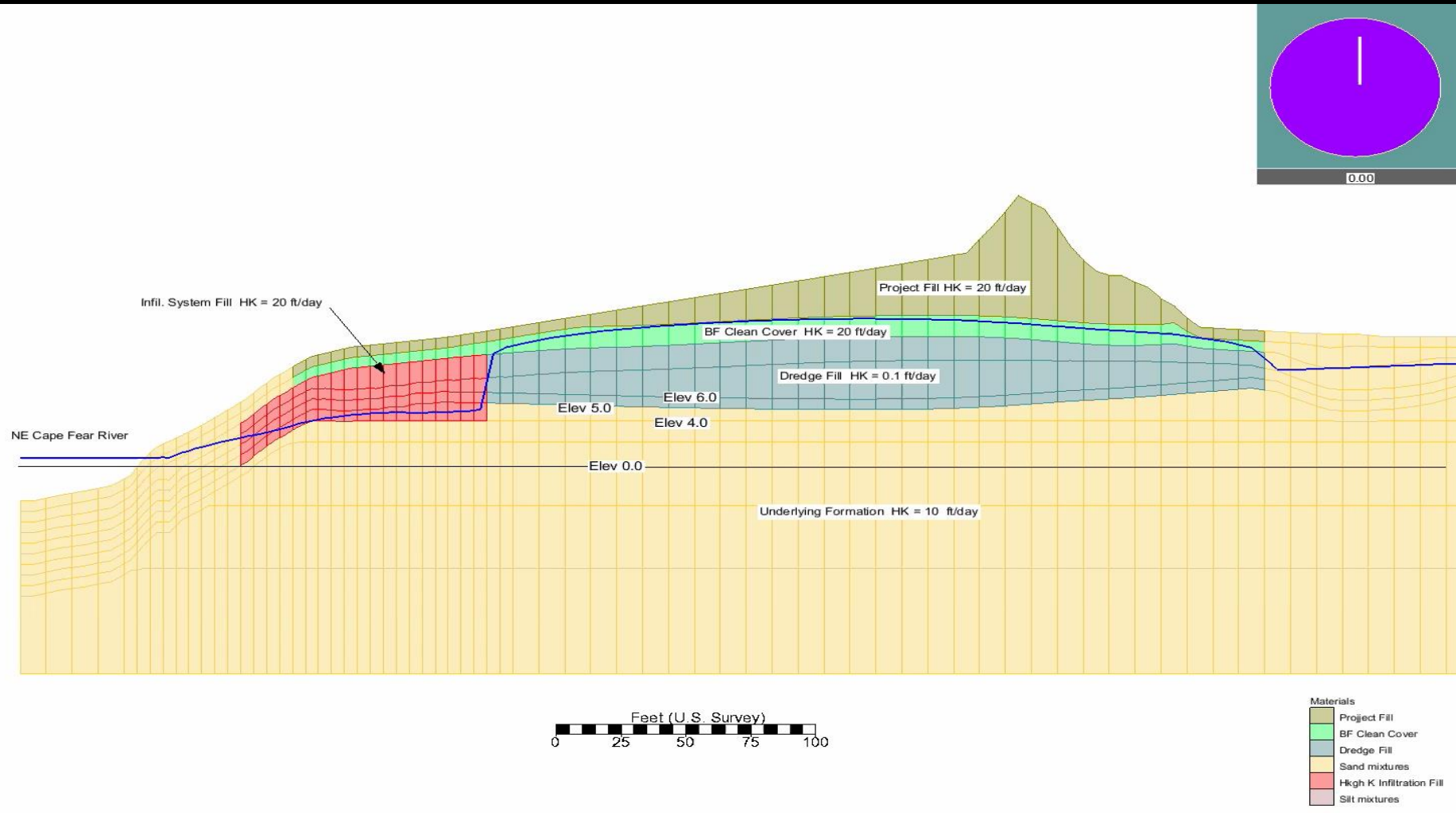


Incremental Design Rainfall, Inches

MODELED WATERTABLE RESPONSE TO DESIGN STORM



MODELED WATERTABLE FROM DESIGN STORM



ADDITIONAL SITE INVESTIGATIONS

- 4 BORINGS TO BASE OF DREDGE MATERIAL
 - GEOPROBE CONTINUOUS CORE
 - COMPOSITE SAMPLE FOR CHEMICAL ANALYSIS
 - CONSTRUCTION COMPANY NEEDED INPUT
- 2 TEST WELLS
 - WATER LEVELS
 - HYDRAULIC CONDUCTIVITY BELOW FILL
 - NEEDED FOR STORMWATER GALLERY DESIGN
 - WATER CHEMISTRY
 - INTERACTION WITH RIVER



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