



Slurry Wall Gravel Pits Update

PRRIP Governance Committee
July 26, 2016

Overview

- ❑ Identify potential gravel pit locations
- ❑ Water Plans A/B
- ❑ Current configurations
- ❑ Preliminary score estimates
- ❑ Reducing uncertainties
- ❑ Alternative concepts
- ❑ Next steps

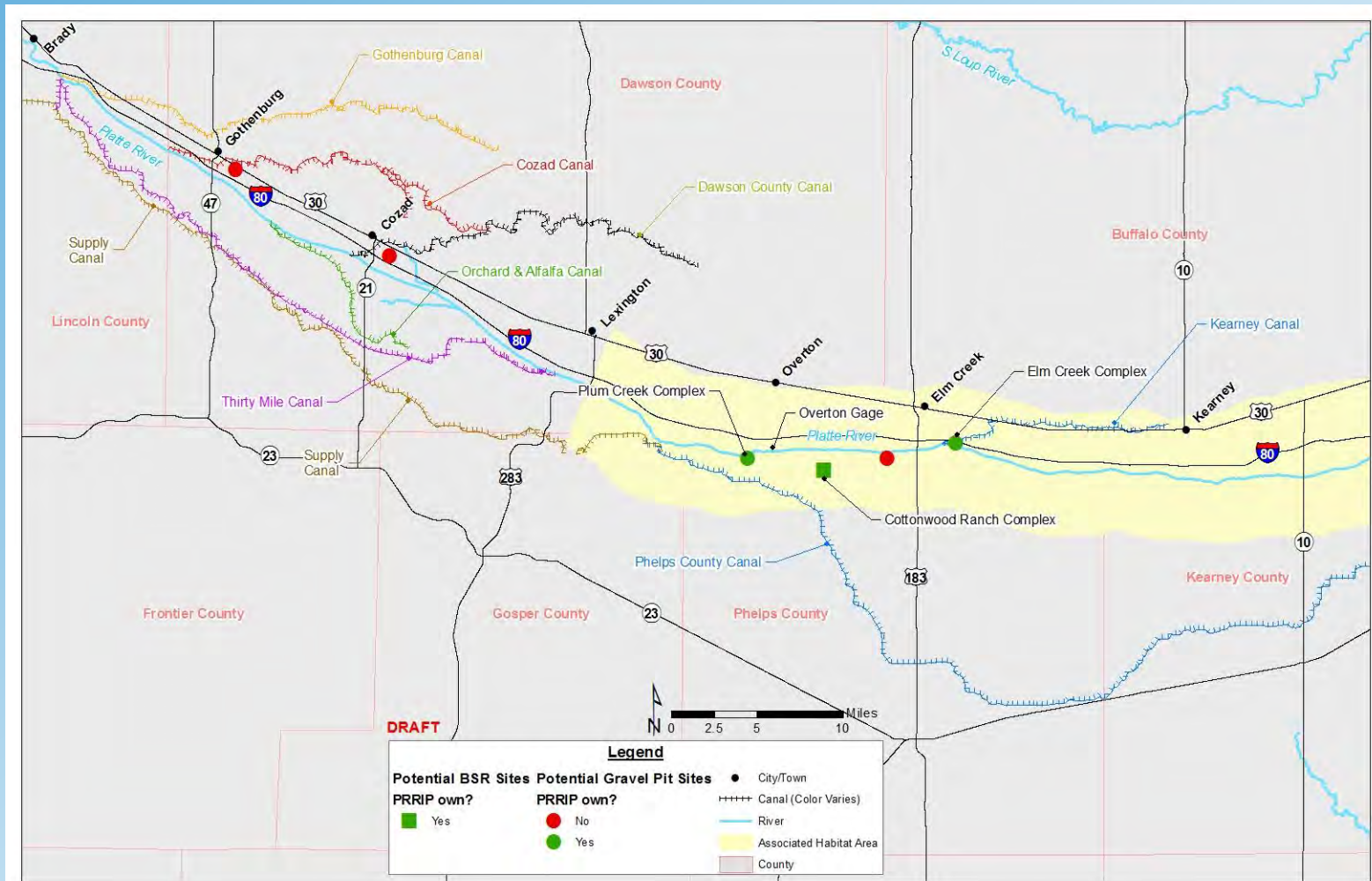


Potential Gravel Pit Locations (1)

- Program-owned lands
 - Elm Creek Complex (Bartels)
 - Plum Creek Complex (Cook/Dyer)
- Non-Program lands
 - Lindstrom property near Elm Creek interchange
 - Cozad Canal near Gothenburg, NE
 - Dawson County Canal near Cozad, NE
- Other possibilities
 - Marshall tract (acquire and retire)
 - East of Cook/Dyer



Potential Gravel Pit Locations (2)



Water Plan A/B

- Water Plan A (Plum Creek)
 - 4,200 AF storage (assumed 30 ft depth)
 - 8,000 AF score estimate
- Water Plan B (Plum Creek, Elm Creek, Lindstrom)
 - 11,400 AF storage (assumed 30 ft depth at Lindstrom, 50 ft depth at Plum Creek and Elm Creek)
 - 19,900 AF score estimate

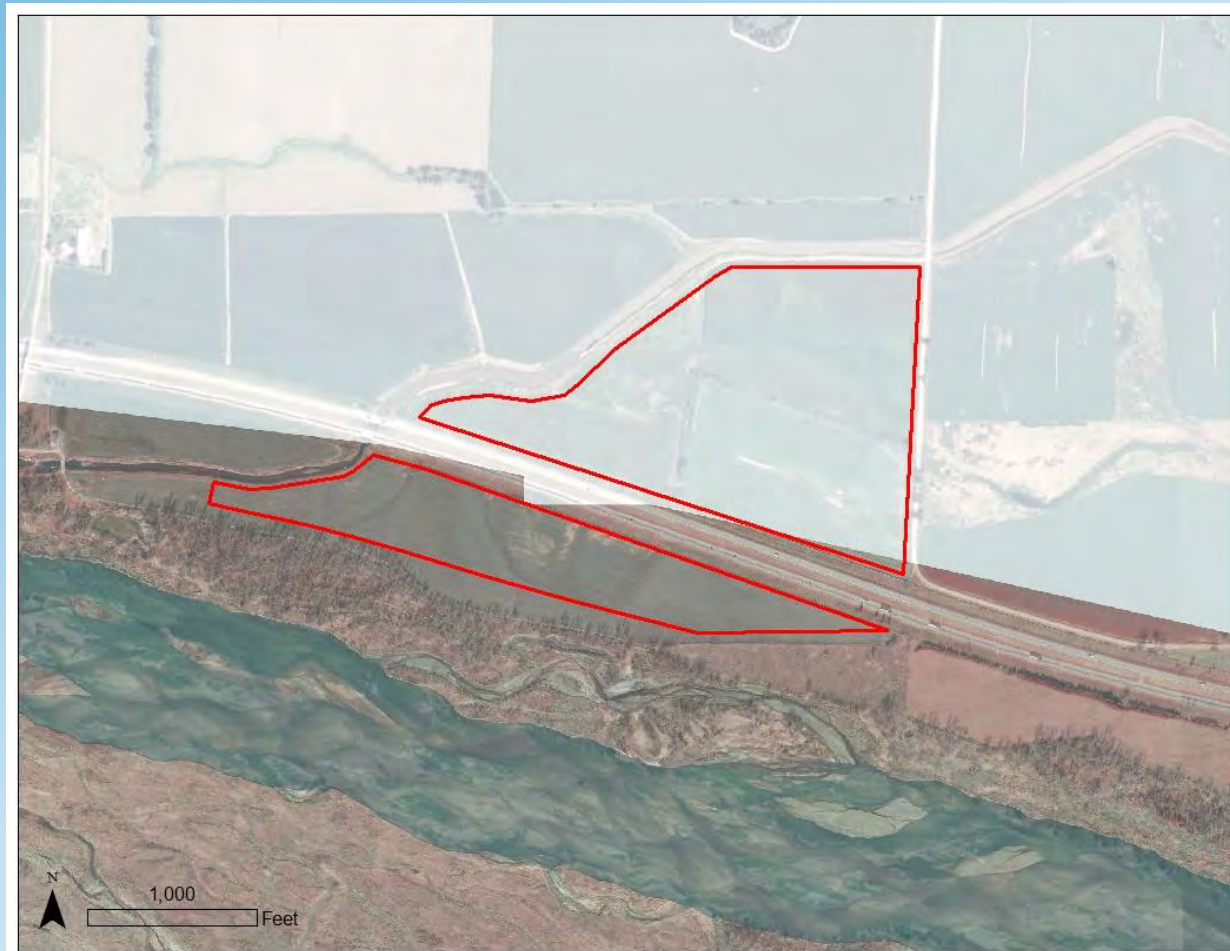


Updated Configurations

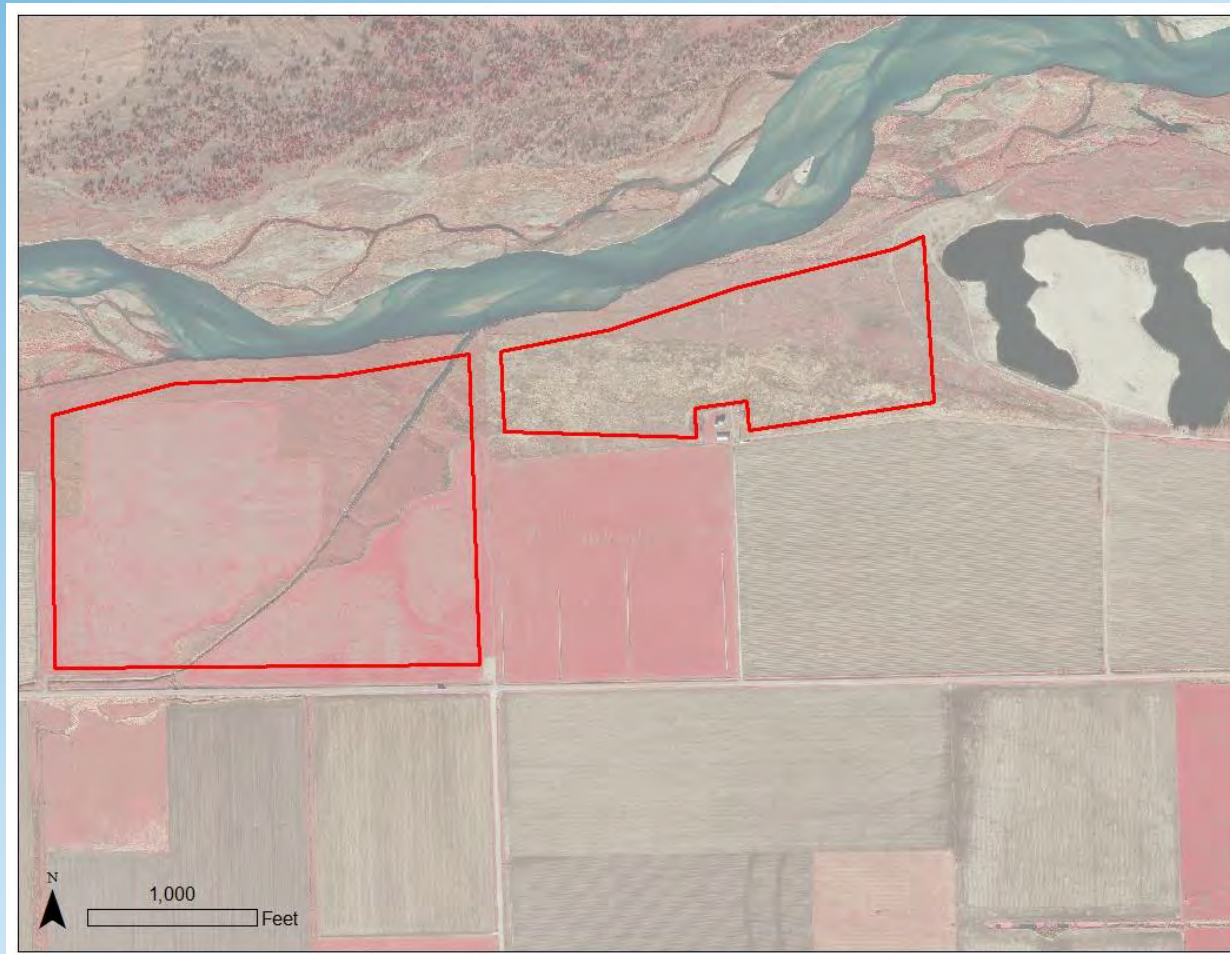
- Field reconnaissance
 - Power lines at Elm Creek Complex
 - Potential culvert crossings at Elm Creek and Dawson County
- More data and info
 - Excluded habitat areas at Plum Creek Complex
 - Bore holes and well logs (revised depths)



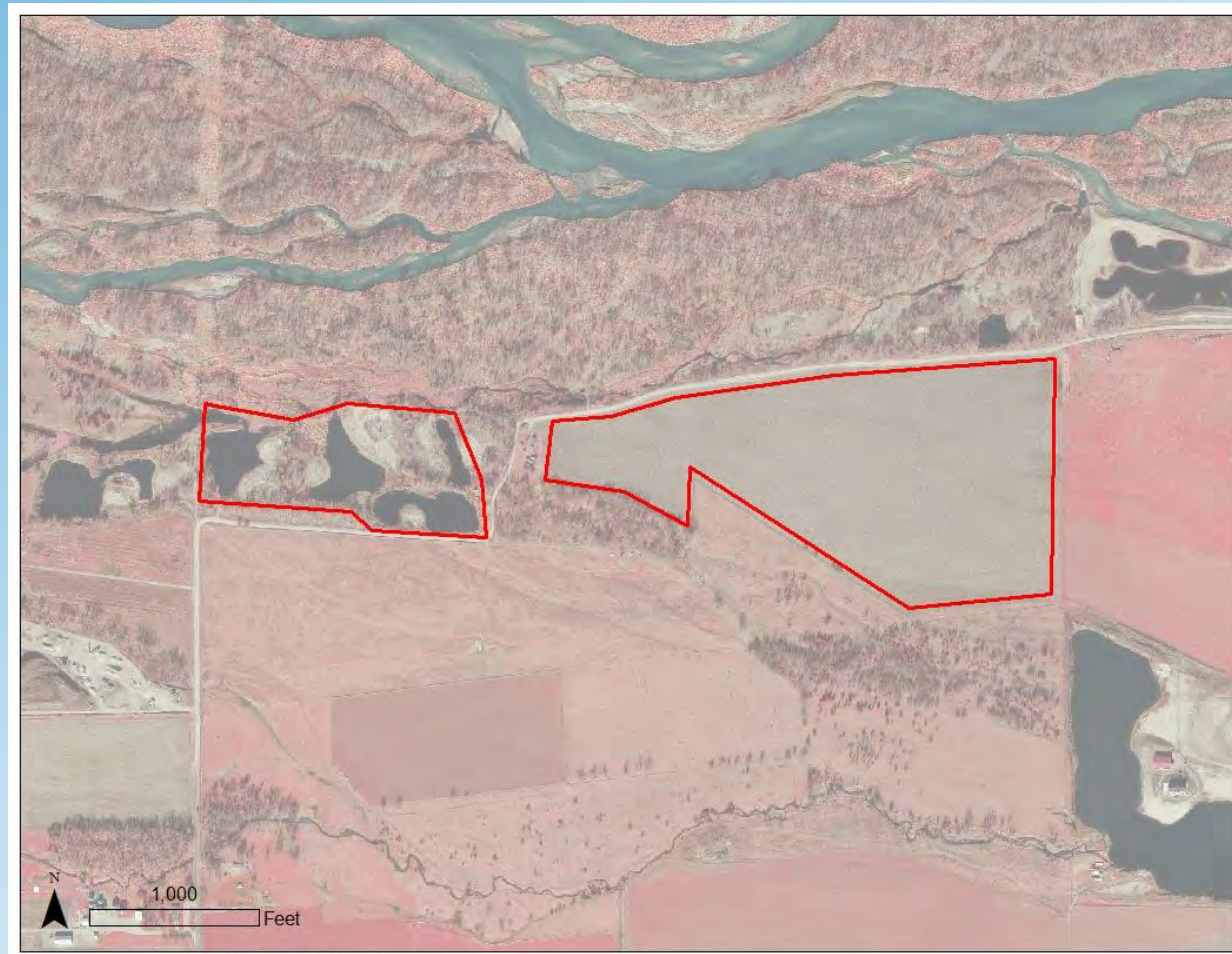
Program-owned (Elm Creek)



Program-owned (Plum Creek)



non-Program (Lindstrom)



Current Score Estimates (1)

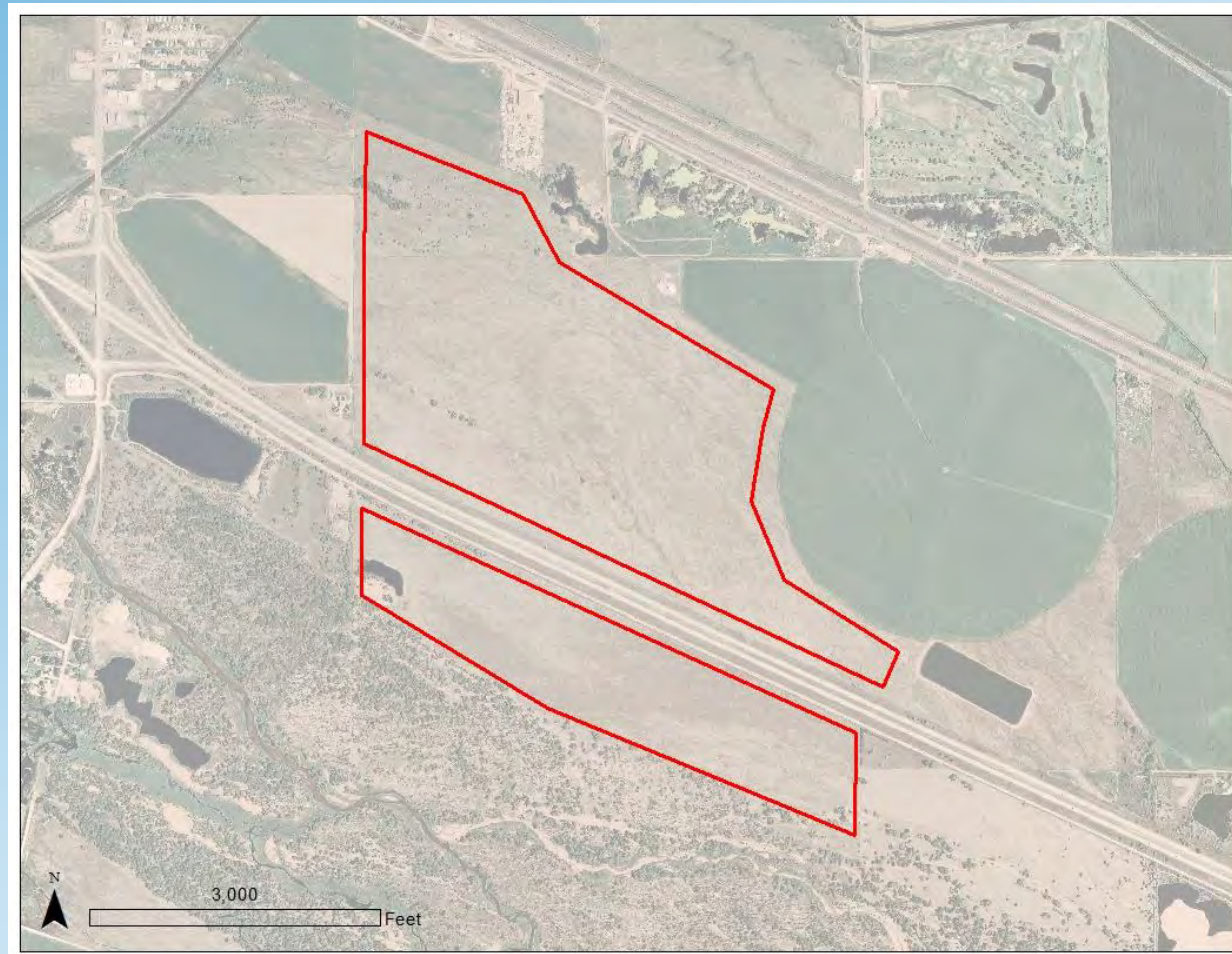
- 3 sites included in Water Plans A/B
- Plum Creek Complex
 - Storage = 3,650 AF (2 cells)
 - Score estimate = 7,400 AF
- Plum Creek, Elm Creek, Lindstrom
 - Combined storage = 7,260 AF (2 cells each site)
 - Score estimate = 15,200 AF



non-Program (Cozad Canal)



non-Program (Dawson County)



Current Score Estimates (2)

- 2 sites not included in Water Plans A/B
- Cozad and Dawson County
 - Combined storage = 15,925 AF (3 cells)
 - Score estimate = 21,100 AF



Gravel Pit Uncertainties

- Presence and extent of impeding layer
 - Depth (30-80 ft?)
 - Thickness (>3 ft required for slurry wall key-in)
 - Permeability (lower = better)
- Ability to get water in/out



Reducing Uncertainties

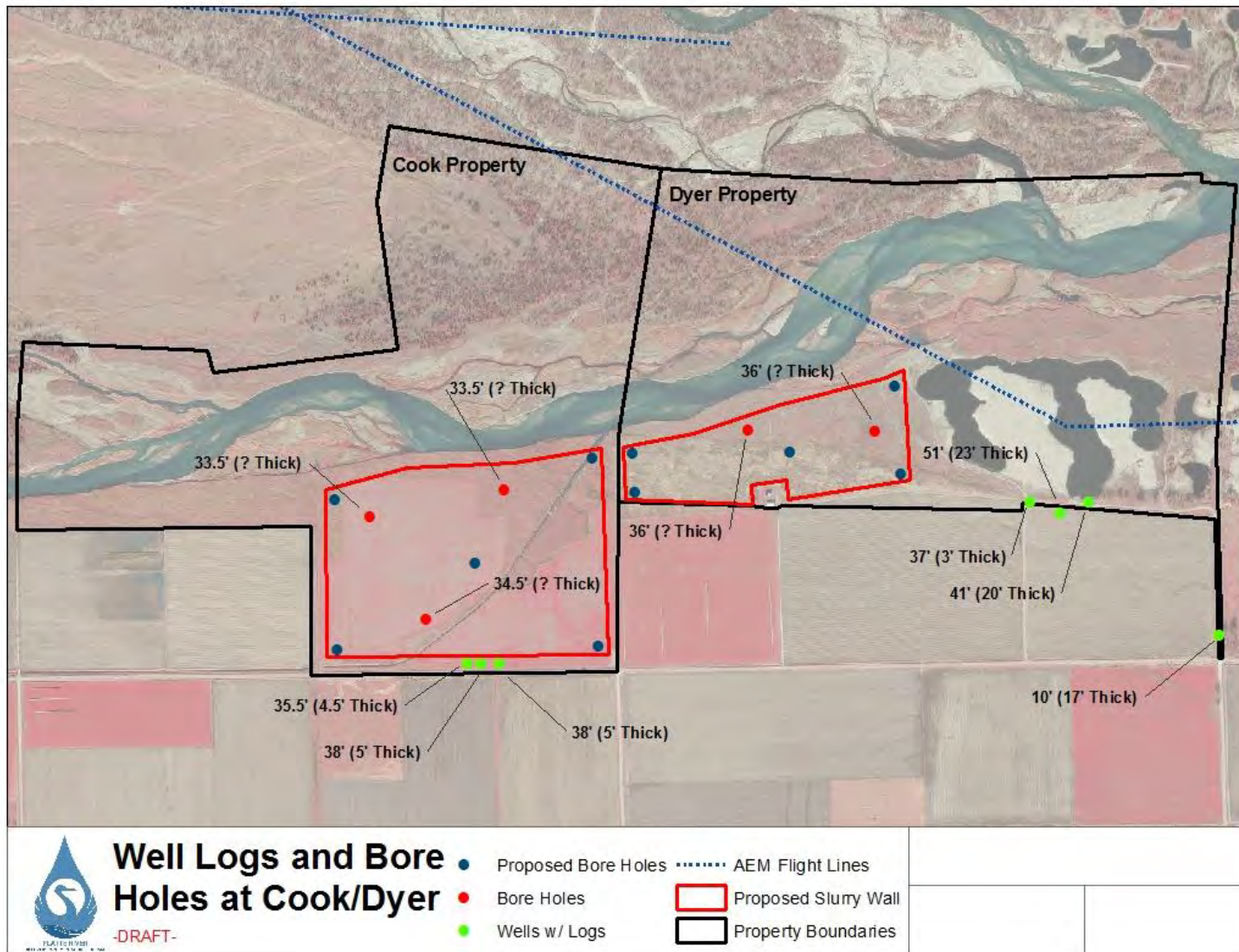
- Review and utilize existing data
 - Aerial photos
 - Previous bore holes and well logs
- Aerial ElectroMagnetic (AEM) survey
 - Flown week of July 11
 - Interpreted data expected in a couple months
- Geophysical data collection
 - USGS (Ohm-mapper) in Sep/Oct
 - New bore holes in the coming weeks



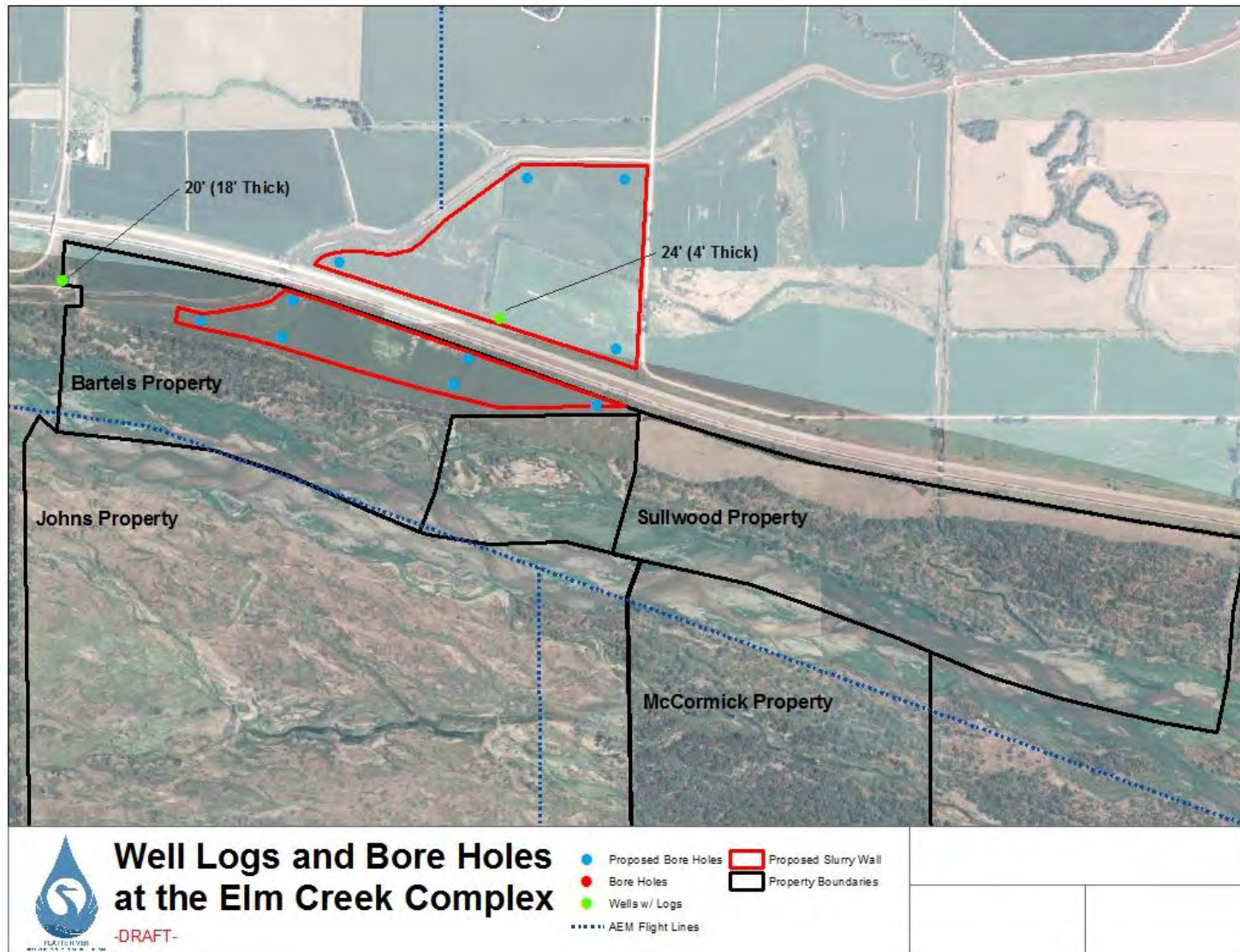
AEM Survey (July 12, 2016)



Proposed Bore Holes (Plum Creek)



Proposed Bore Holes (Elm Creek)



Alternative Concepts

- Add berms around gravel pits to increase capacity
- Confined groundwater reservoirs
 - Merger of BSR and gravel pit concepts
 - Slurry wall around BSR or gravel pit site
 - Store water in the sand and gravel pore spaces—only about 20% capacity of open surface water
 - Fill by covering land with water and infiltrating
 - Recapture by pumping



Next Steps (1)

- Focus on Plum Creek complex
 - ▣ Refine cell footprints
 - ▣ Evaluate as gravel pit or confined groundwater storage
 - ▣ Evaluate inlet/outlet options
- Further geophysical surveys
 - ▣ Groundtruth AEM results
 - ▣ Benefits for both BSR and gravel pits
- Investigate non-Program lands
 - ▣ Elm Creek (north of I-80), Cozad, Dawson
 - ▣ East of Cook/Dyer, Marshall



Next Steps (2)

- Cost evaluation
 - Large acreages of non-Program lands
 - Excavation of aggregate materials
 - Use some to construct berms, increase capacity
 - Sell some to offset costs
 - Associated infrastructure
 - Inlet/Outlet structures
 - Pumpstations
 - Wells for non-excavated storage
- Permitting requirements
 - NDNR
 - Corps of Engineers



Questions?

