Structural/Operational Changes

Wapatox Canal Improvements

-Lower Naches River

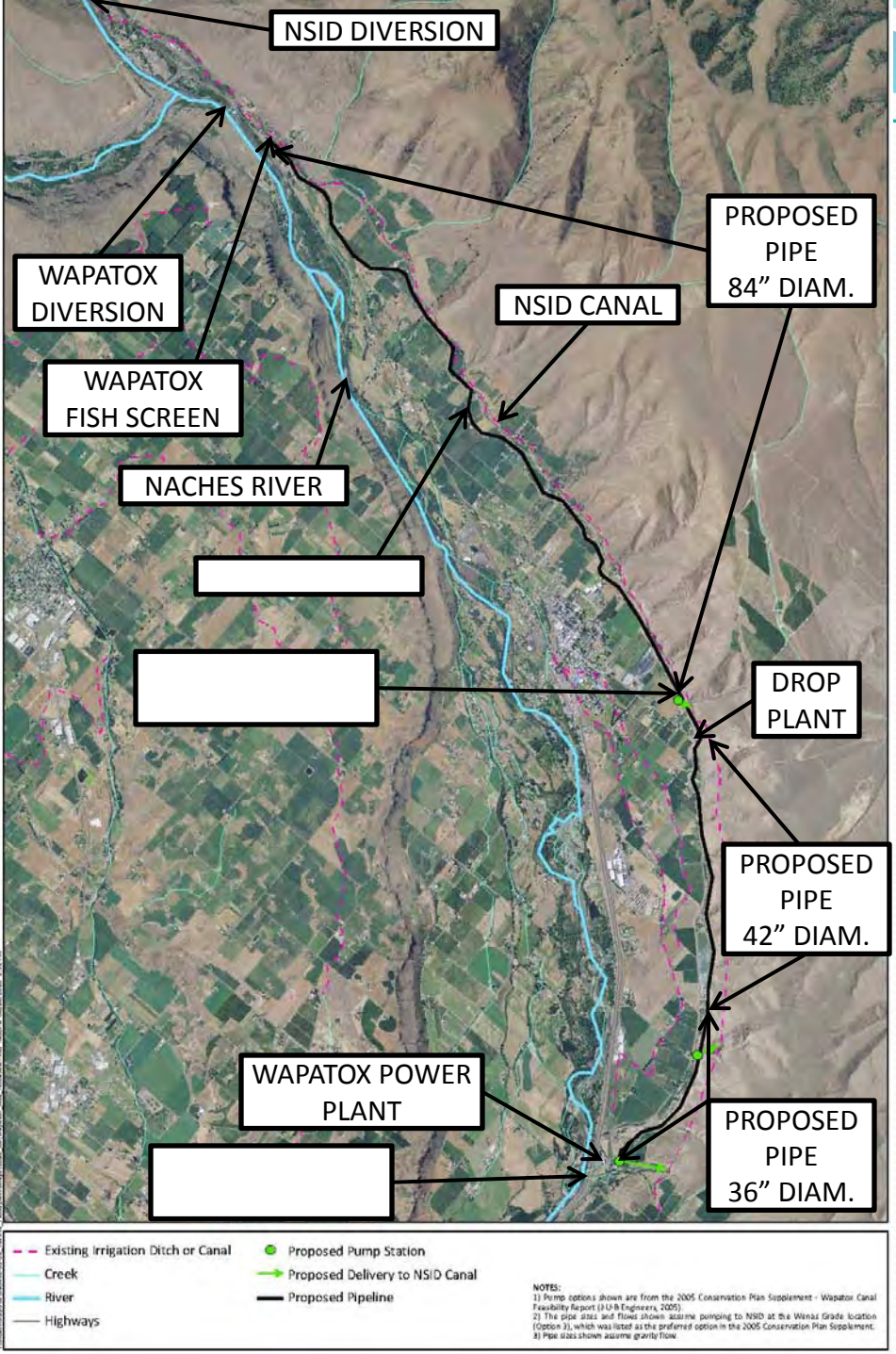
Basin Study Task 4.2

Wapatox Canal Improvements Summary

- Project would reduce diversions from Lower Naches River and remove diversion structures from river
- Alternatives identified include:
  1. Pumping from Wapatox Canal to NSID Main Canal
  2. Piping the Wapatox Canal
  3. Piping the Wapatox Canal and providing capacity for the City of Yakima WTP Intake and the Gleed Ditch

Wapatox Canal Background

- Originally Owned and Operated by PacifiCorp
  - Diversion, 8-mile Canal, Drop Plant and Power Plant
- Reclamation Purchased 450 cfs Water Right in 2003
- Current Operation
  - Reclamation diverts up to 115 cfs during irrigation season to supply Wapatox Ditch Company (~50 cfs)
- Previous Studies
  - *Naches-Selah Irrigation District (NSID) Conservation Plan Supplement - Wapatox Canal Feasibility Report* (2005, J-U-B Engineers)

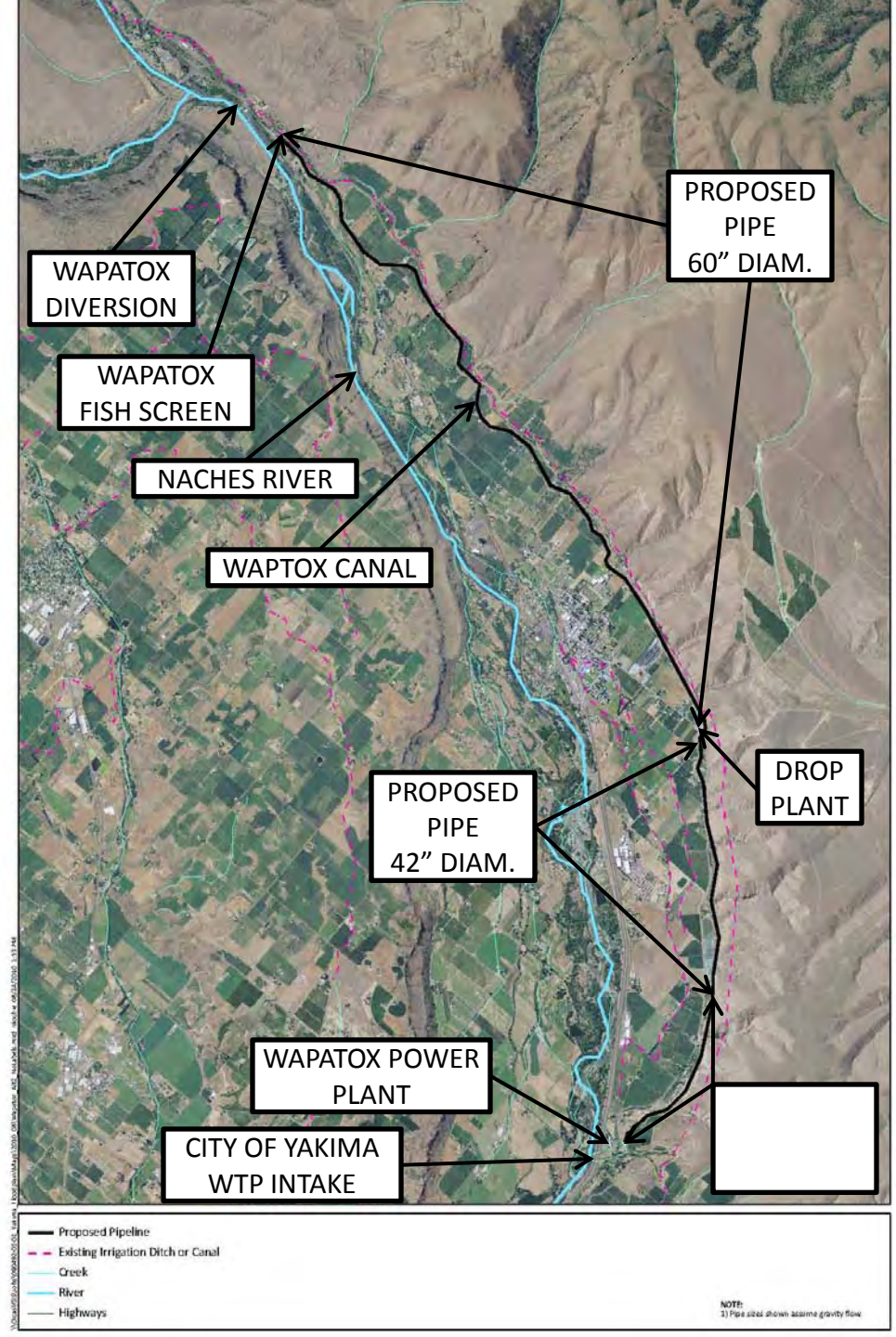


Alternative 1 – Pump to NSID from Wapatox Canal

- Flows
  - 186 cfs diversion
    - 50 cfs for Wapatox Ditch
    - 136 cfs for NSID
- Pumping (Per 2005 Study)
  - 136 cfs to NSID at Wenas Grade location
  - Other Options - Bailey Flume, Rowe Hill
- Piping
  - 84" (Upper Canal)
  - 36" to 42" (Lower Canal)

Alternative 1 – Benefits and Challenges

- Benefits
  - Would consolidate NSID and Wapatox Diversions
  - Would allow for removal of the NSID diversion structure
  - Would allow NSID to abandon portions of the NSID main canal difficult to operate and maintain
  - Would reduce diversions from the Naches River
- Challenges
  - Existing Canal may be susceptible to failure if piping of Wapatox Canal isn't implemented with pumping
  - A spill pipe or additional upgrades would be needed to spill water in the event pumps shut down



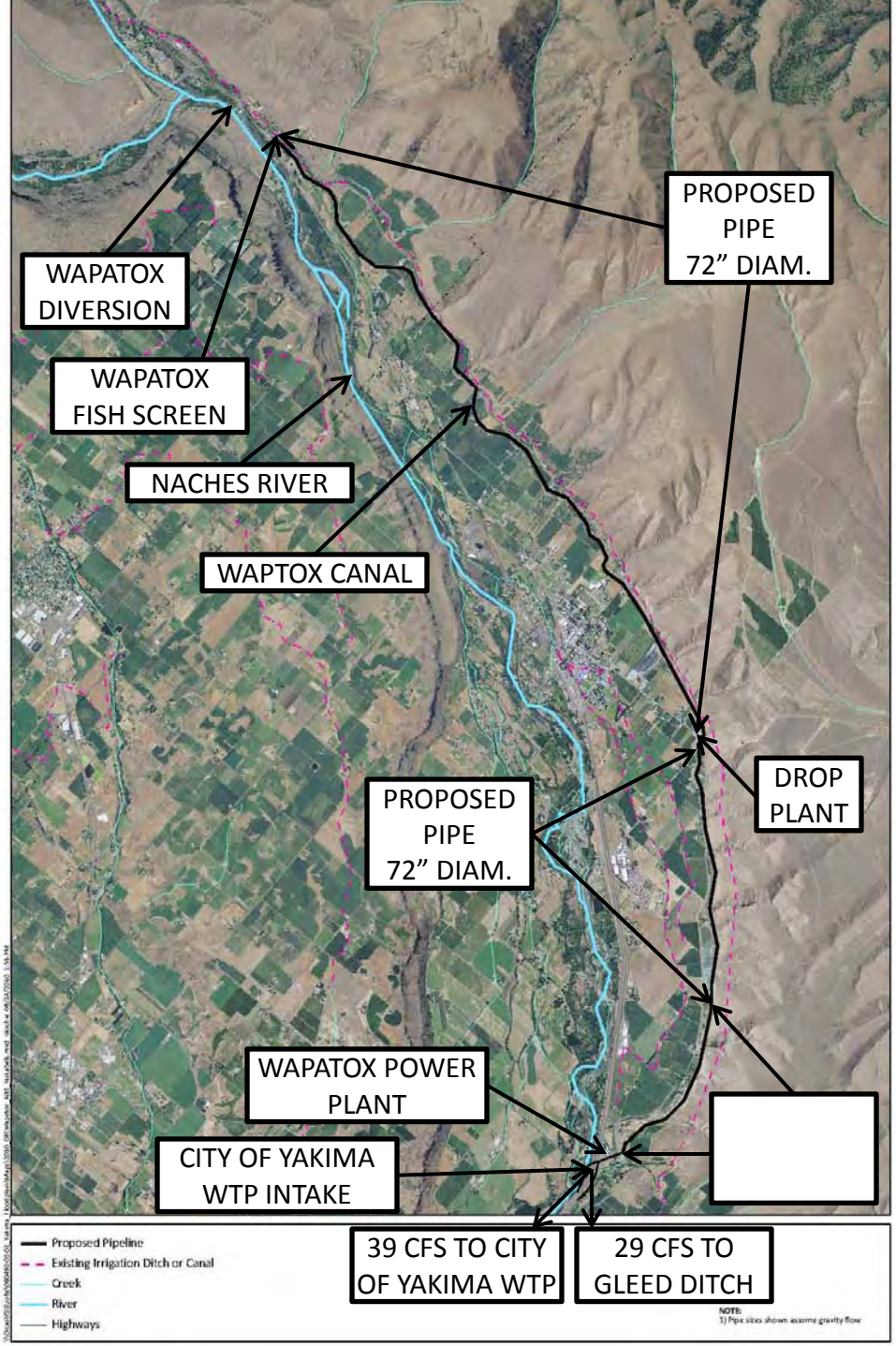
Alternative 2 – Pipe Wapatox Canal

- Delivery Only to Wapatox Ditch Company users
- Flows
  - 50 cfs diversion
  - 40-50 cfs Upper Canal
  - 15-30 cfs Lower Canal
- Piping
  - 60" (Upper Canal)
  - 36" to 42" (Lower Canal)

Alternative 2 – Benefits and Challenges

- Benefits
  - Reduce diversions from the Lower Naches River
    - Would require smaller diversion to serve Wapatox Ditch Co. - carriage water would be reduced or eliminated
    - Would reduce canal losses
- Challenges
  - Alternative 2 would not provide capacity to supply the City of Yakima WTP Intake. City would have to divert supply directly from the Naches River

Alternative 3 – Pipe Wapatox Canal



- Delivery to Wapatox Ditch Co., City of Yakima WTP, and Gleed Ditch Co.
- Flows
  - 118 cfs diversion - 50 cfs for Wapatox, 39 cfs for City of Yakima, 29 cfs for Gleed Ditch
  - 108-118 cfs Upper Canal
  - 83-98 cfs Lower Canal
- Piping
  - 72" (Upper Canal)
  - 60" to 72" (Lower Canal)

Alternative 3 – Benefits and Challenges

- Benefits
  - Reduced diversions from the Lower Naches River
    - Would require smaller diversion to serve Wapatox Ditch Co. - carriage water would be reduced or eliminated
  - Consolidation of Wapatox, City of Yakima, and Gleed Ditch diversions would eliminate need for channel regulation and allow for restoration of floodplain
- Challenges
  - Would require larger, more expensive pipe to convey higher flow rates
  - Piping from end of canal to Gleed Ditch – limited space, steep slopes, other obstacles

Other Options to Consider

- Pressurization
  - Pipe sizing presented represents gravity flow conditions
  - Controlling the tailwater flow and pressurizing the system, or a portion of the system would allow for reduced pipe sizes
  - Pressure rated pipe would be more expensive
  - Pressurization could allow for power recovery at City of Yakima WTP Intake
- Combine the Alternatives Presented
  - Provide pipeline with pumping to NSID and capacity to supply City of Yakima WTP and Gleed Ditch Company

Recommendations for Further Evaluation

- Determine level of interest from each entity
- Refine design flows – Flows presented are based on water rights and diversion records
- Refine pipe sizing, pump sizing, alignments and facility locations
- Identify additional alternatives or options to be evaluated based on input from stakeholders
- Evaluate and compare costs and benefits of each alternative

Next Steps

- Select Alternative to cost for Integrated Plan
- Confirm quantities and develop cost estimates
- Define flow and other benefits
- Refined results presented at September or October Workgroup Meeting

Disclaimer

- Results discussed today are working drafts
- Data and calculations are still being checked and results may be updated