DESIGNING FISH SCREEN SYSTEMS FOR SEDIMENT-PRONE SITES: WATER JETTING DESIGN AND PROJECT APPLICATIONS

JOHN BURNETT, RUSSELL BERRY, RUSSELL JORDAN, AND DARRYL HAYES

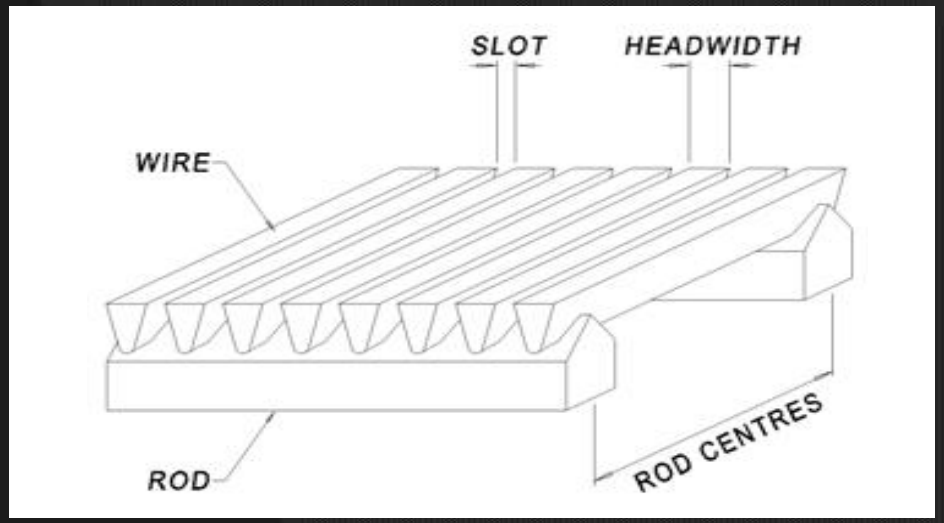
INTAKE SCREENS, INC.



SEPTEMBER 15-17, 2026

2026 PACIFIC NORTHWEST FISH SCREENING AND PASSAGE WORKSHOP

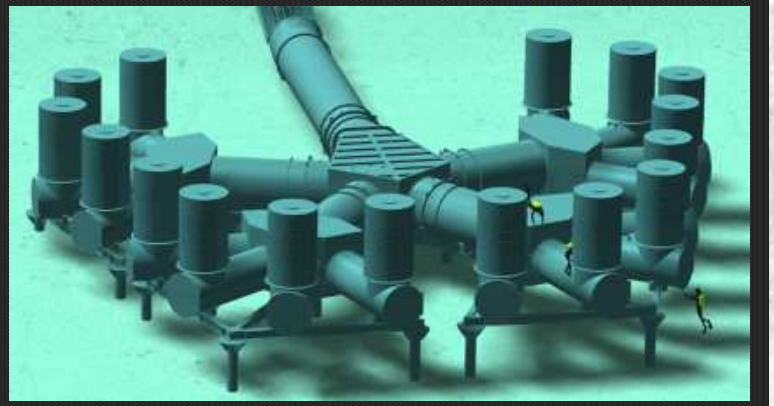
ENTERPRISE, OREGON


SLOT
HEADWIDTH
WIRE
ROD
ROD CENTRES









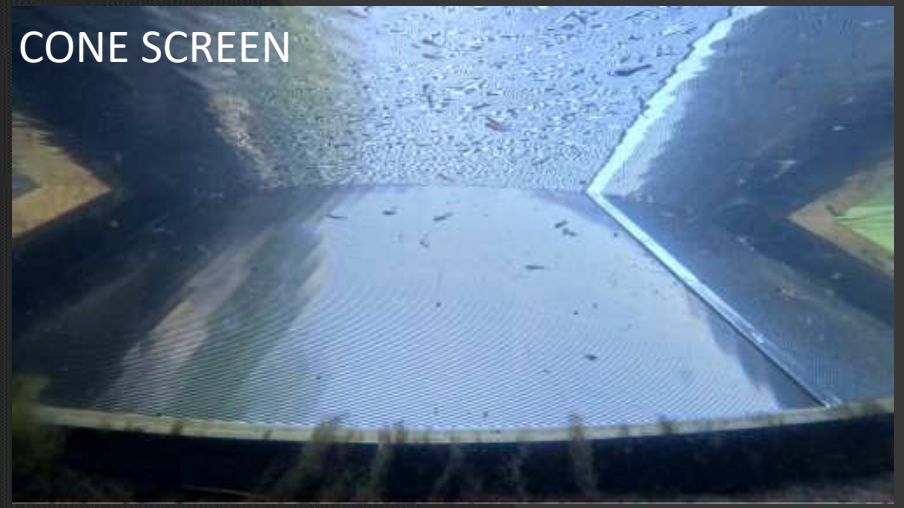




MECHANICAL BRUSH–CLEANED WEDGE WIRE SCREEN DESIGN

- Place screens out in the waterbody
- No fish or debris collection and conveyance
- Low approach and through-screen velocities; 0.5 - 6.35 mm slot openings
- Mechanical-brush cleaning









WHY CONSIDER WATER JETTING?





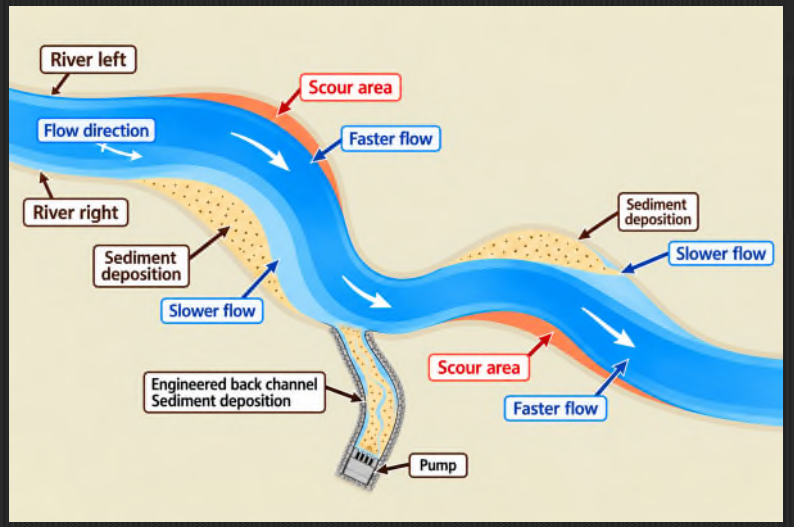


SOURCE: MILWAUKEE METROPOLITAN SEWAGE DISTRICT



JETTING IS NOT THE FIRST LINE OF DEFENSE

- Avoid depositional areas
- Avoid back-channel areas
- Place screens in moving water
- Consider sluicing features – sluicing requires head





LAKE OSWEGO SCREENS



LAKE OSWEGO – TIGARD MWT PLANT INTAKE



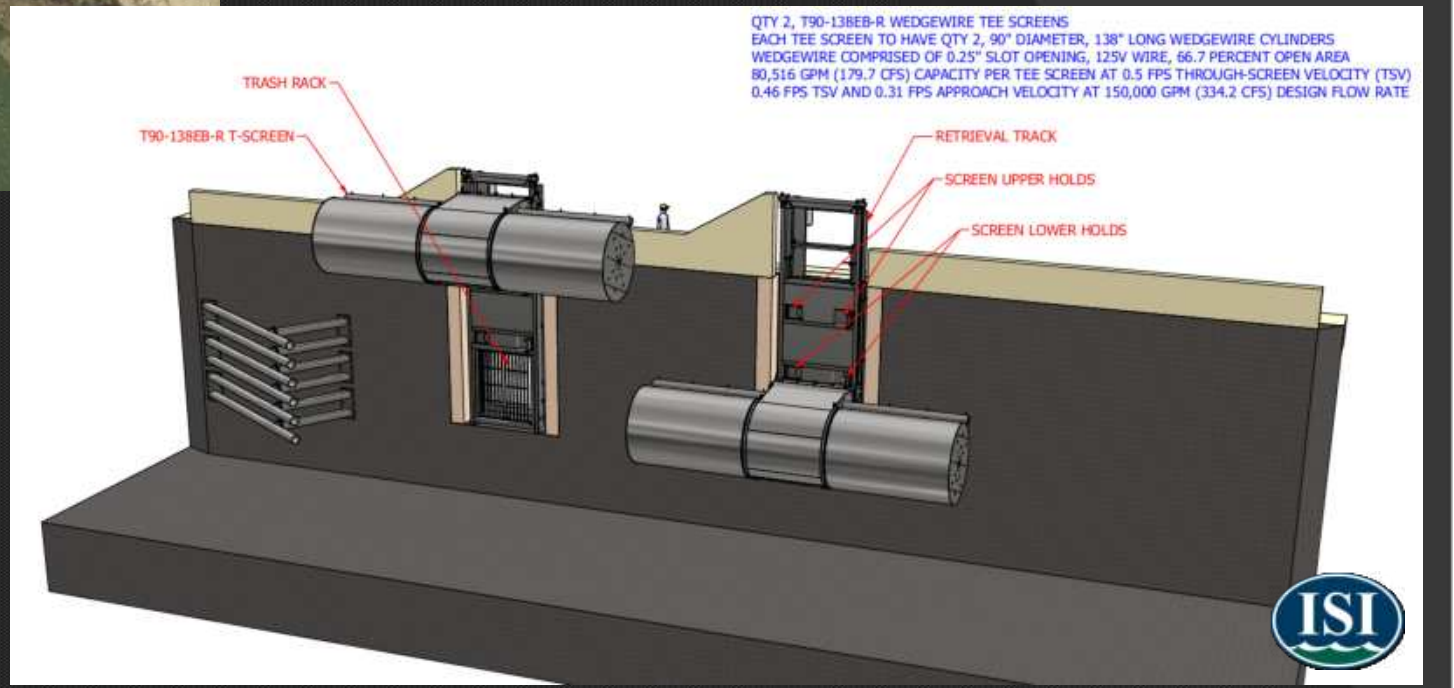
ALAMEDA CREEK DIVERSION

“HIGH” PRESSURE, “LOW” VOLUME JETTING



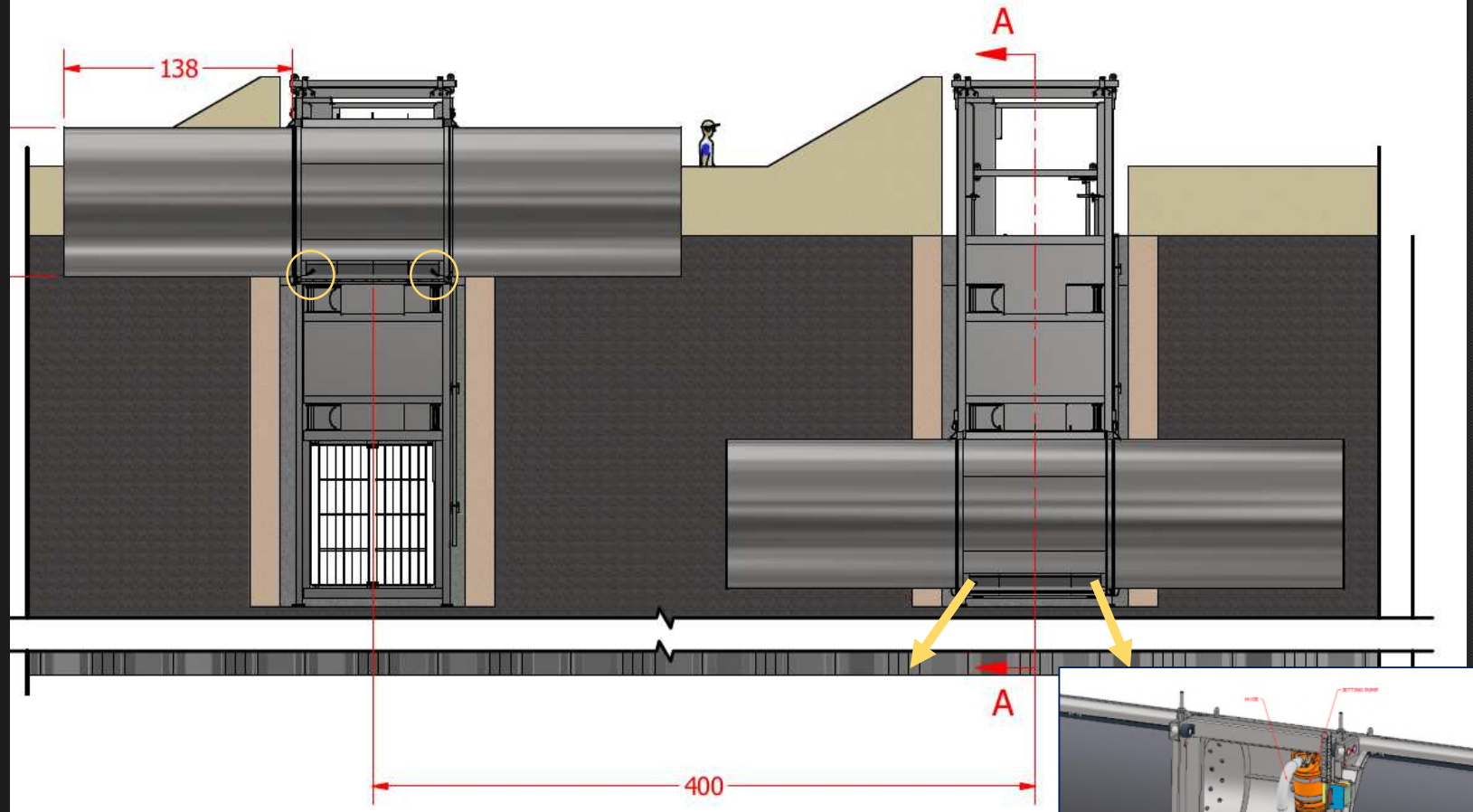
EXAMPLE PROJECT: HARRIS RESERVOIR (TX)

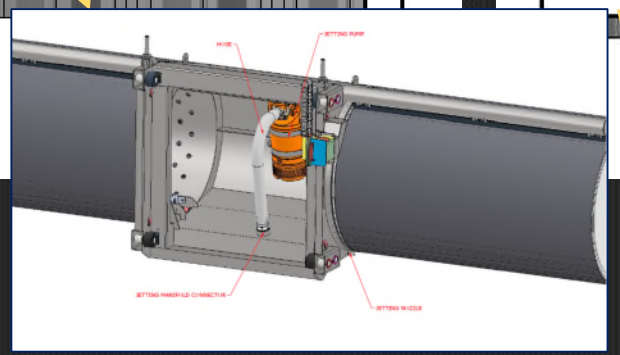


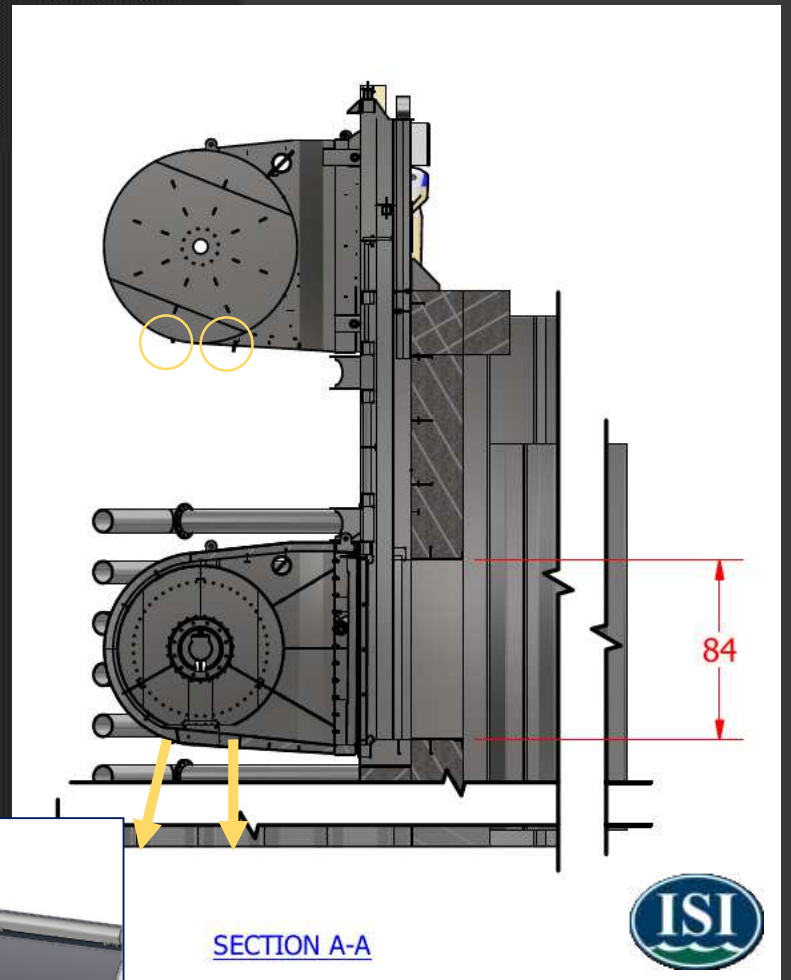


EXAMPLE PROJECT: HARRIS RESERVOIR (TX)

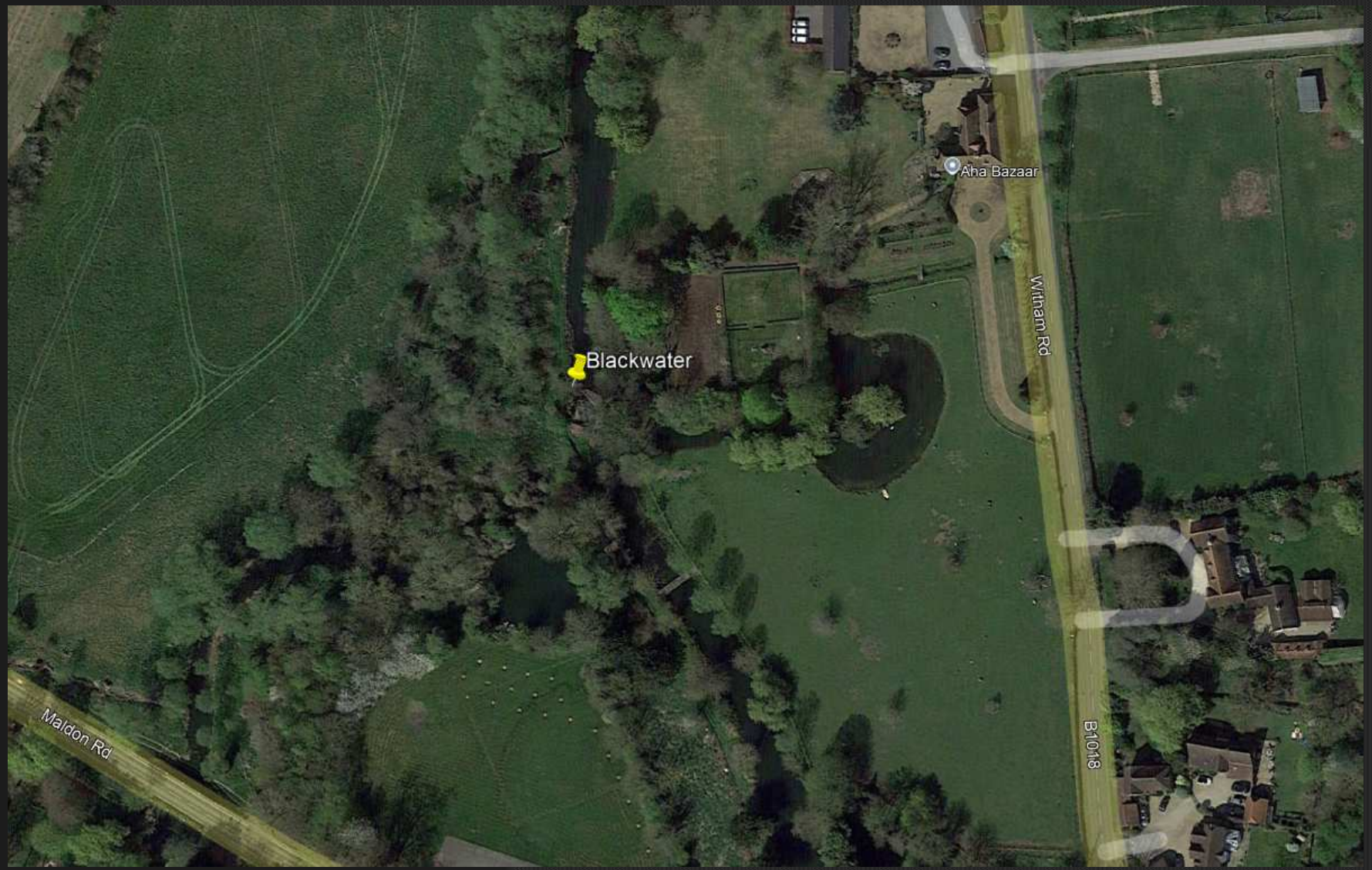
8.9 HP pump per tee screen; 4 nozzles; 50 psi, 50 gpm per ½" ID nozzle





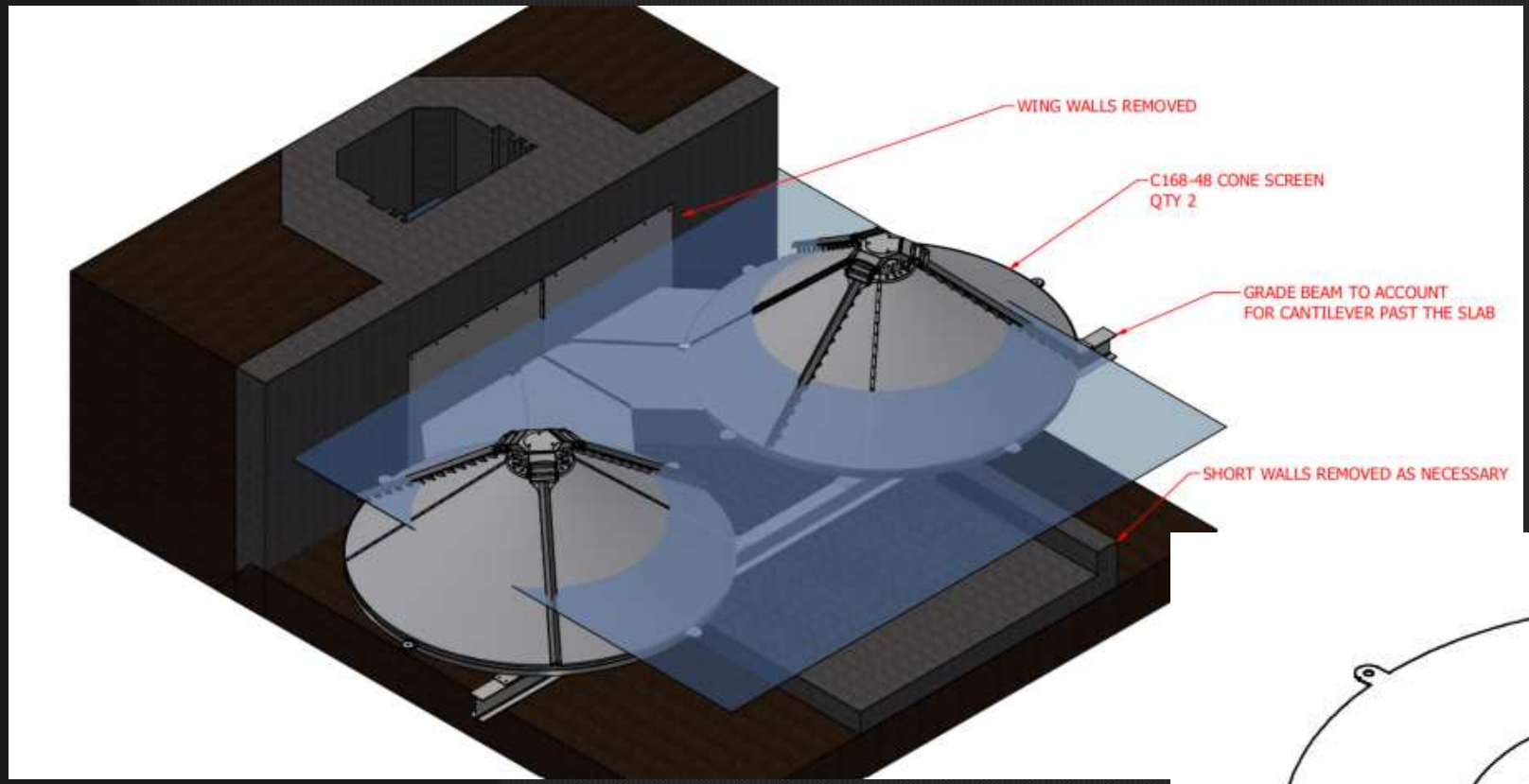


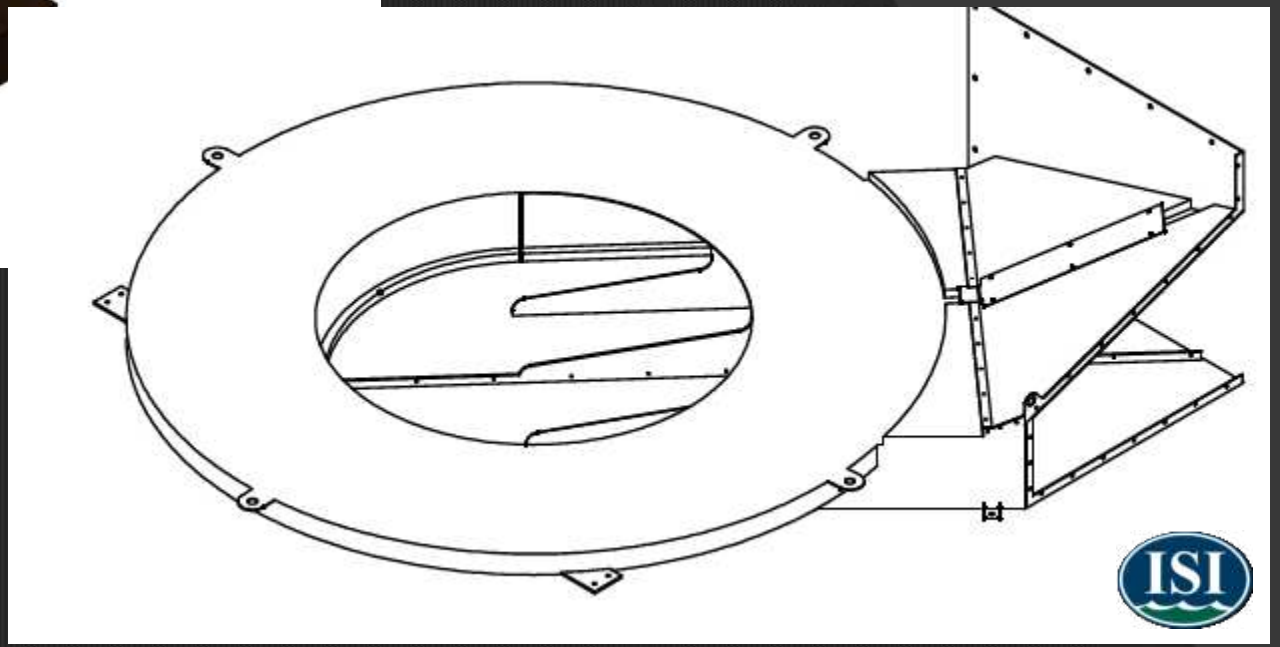
EXAMPLE PROJECT: BLACKWATER (UK)





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EXAMPLE PROJECT: NELSON DAM IRRIGATION DIVERSION (WA)



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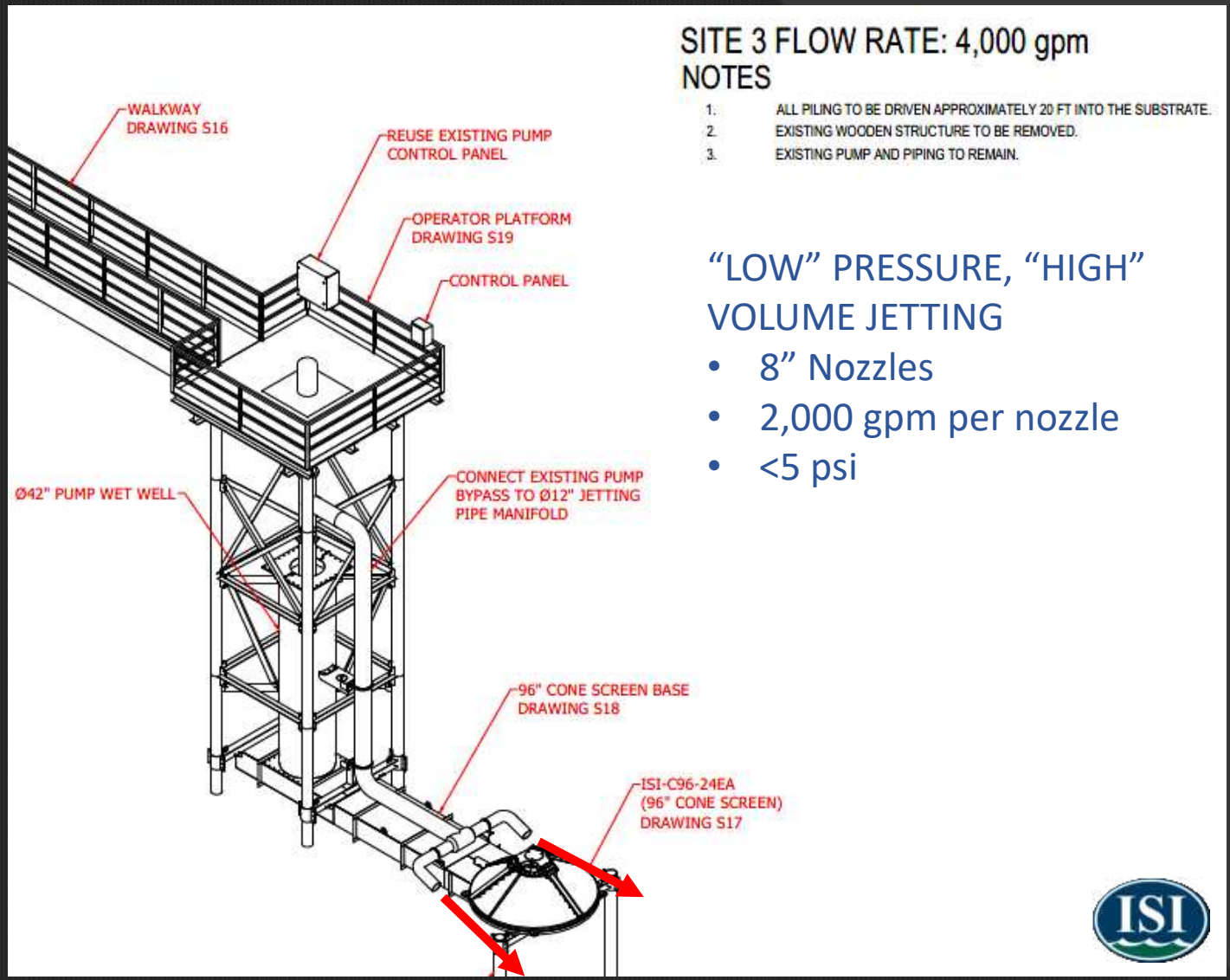
EXAMPLE PROJECT: EBMUD HILDER (CA)





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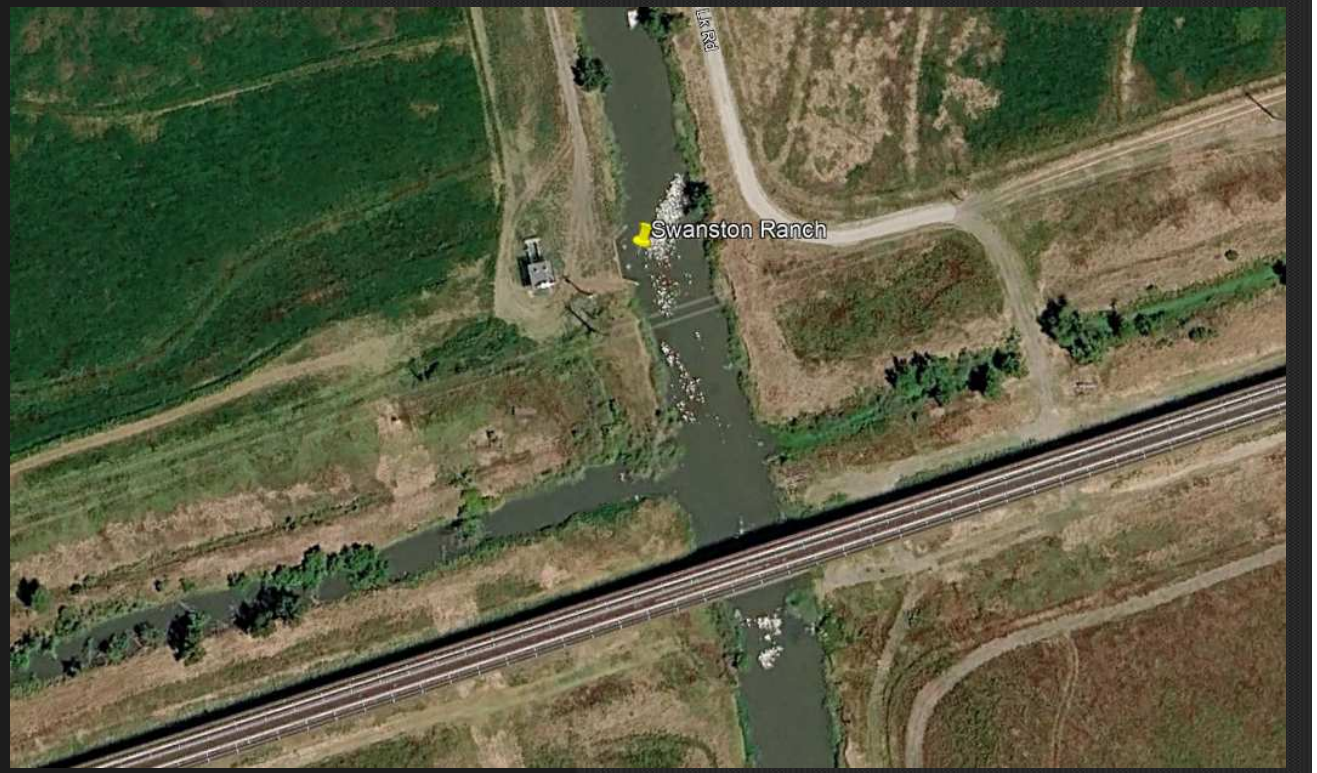


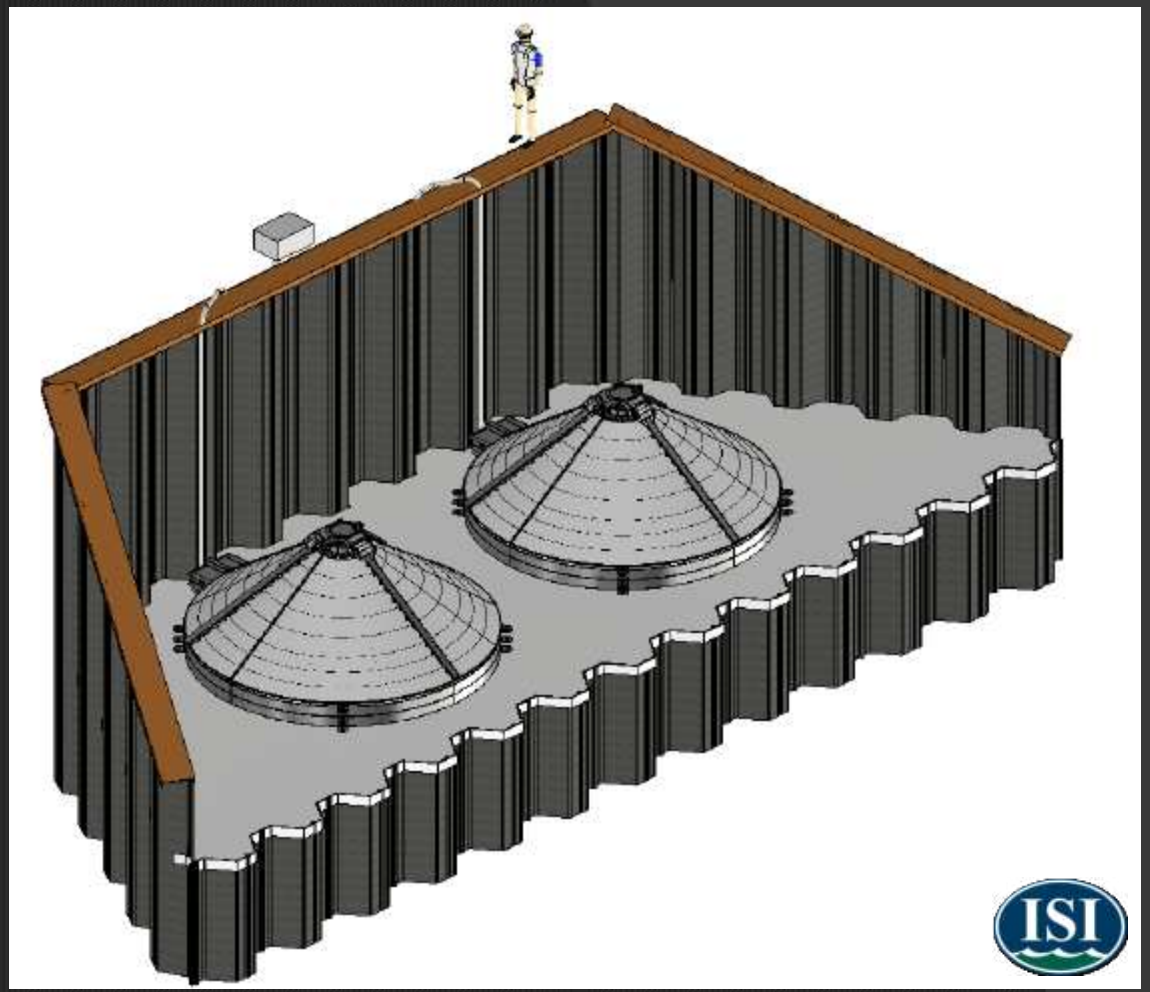


"LOW" PRESSURE, "HIGH" VOLUME JETTING

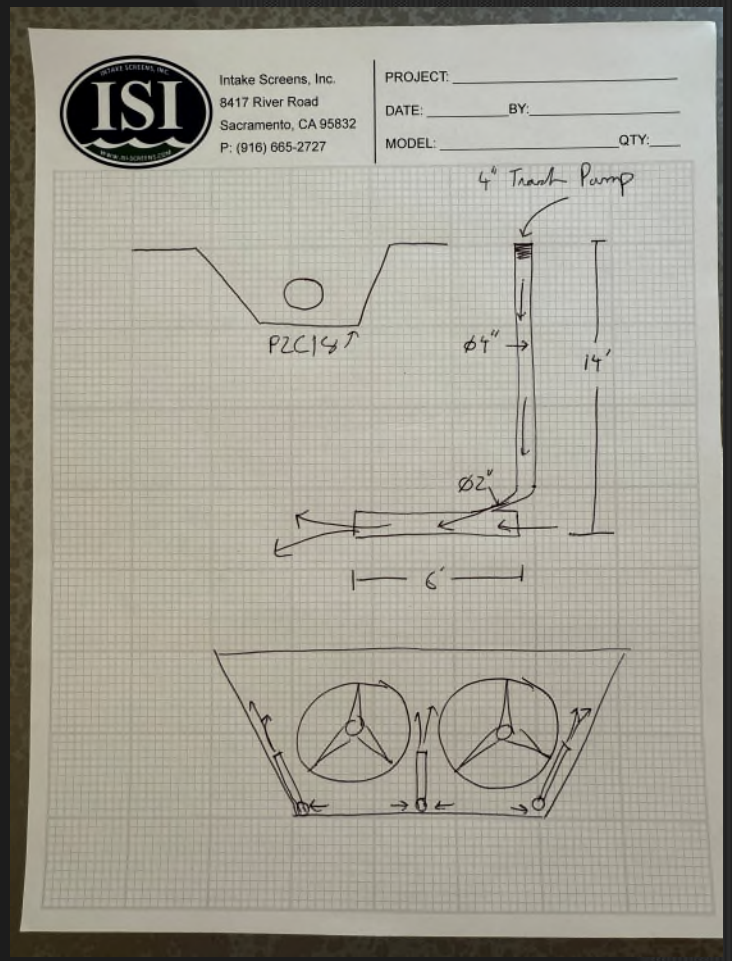
- 8" Nozzles
- 2,000 gpm per nozzle
- <5 psi

EXAMPLE PROJECT: SWANSTON RANCH (CA)





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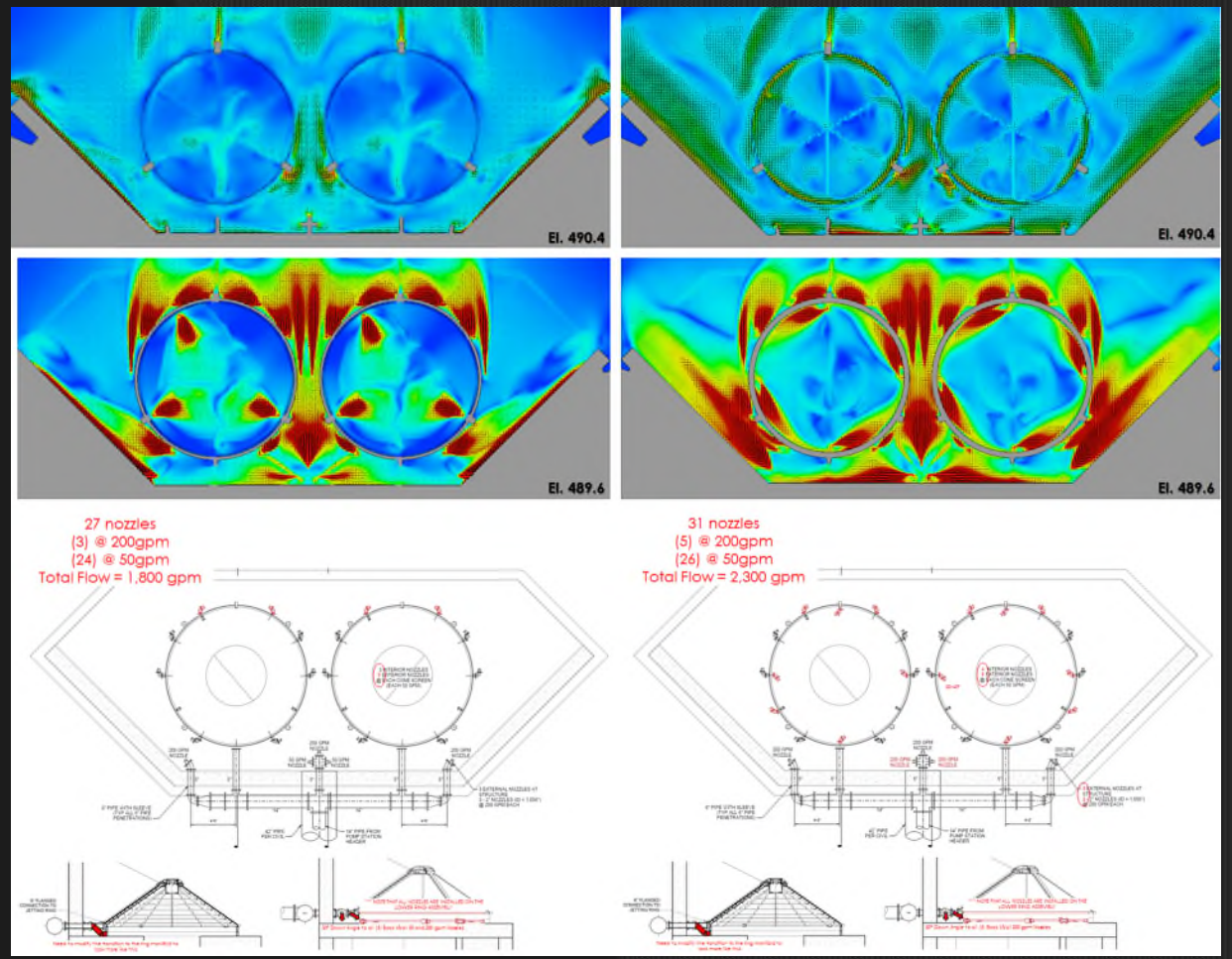


"LOW" PRESSURE, "HIGH" VOLUME JETTING

- 4" Portable trash pump (400-600 gpm)
- 2" and 4" nozzles
- 10-15 ft/s in 4" pipe



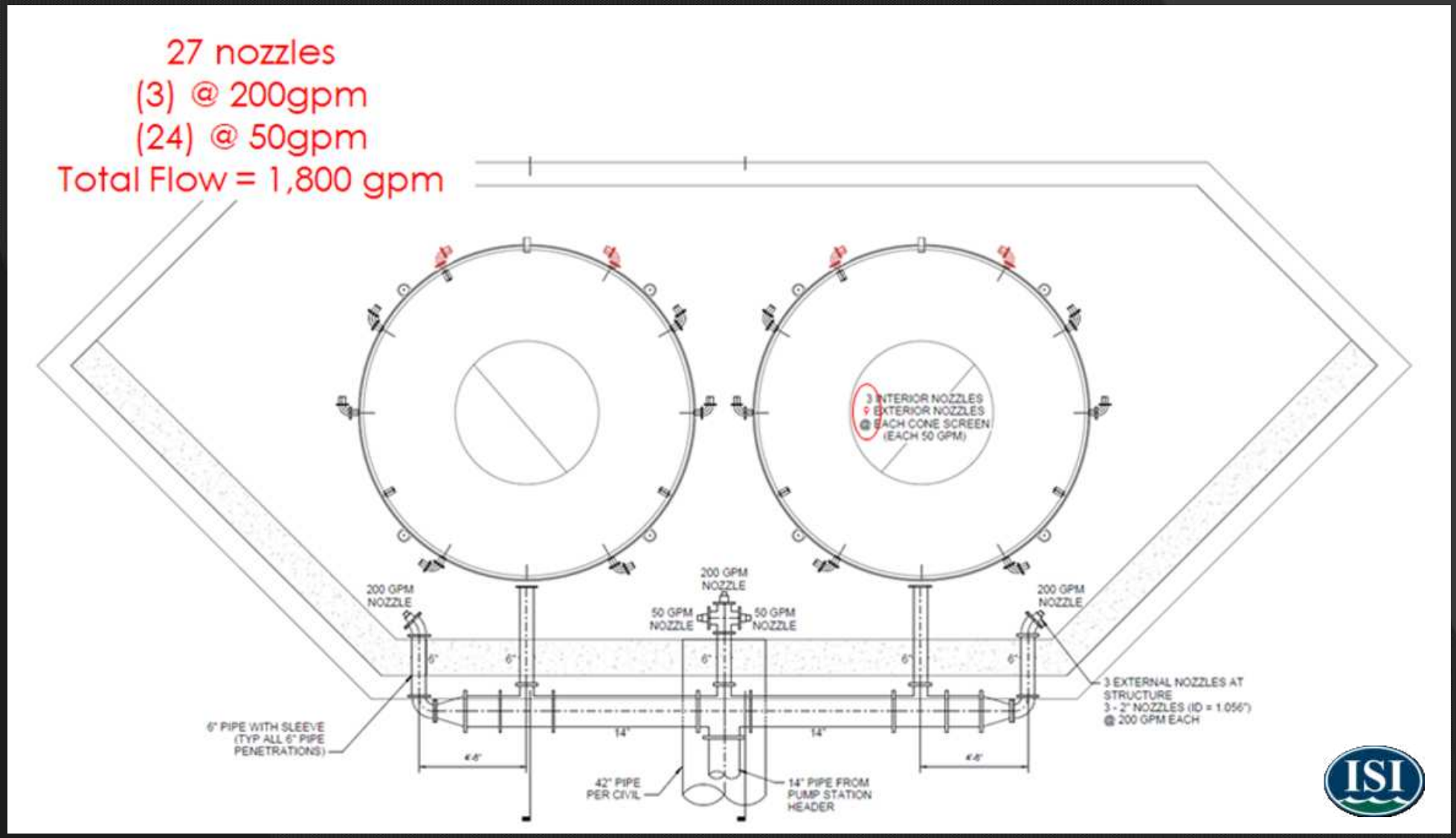
EXAMPLE PROJECT: CPWS DUCK RIVER (SC)



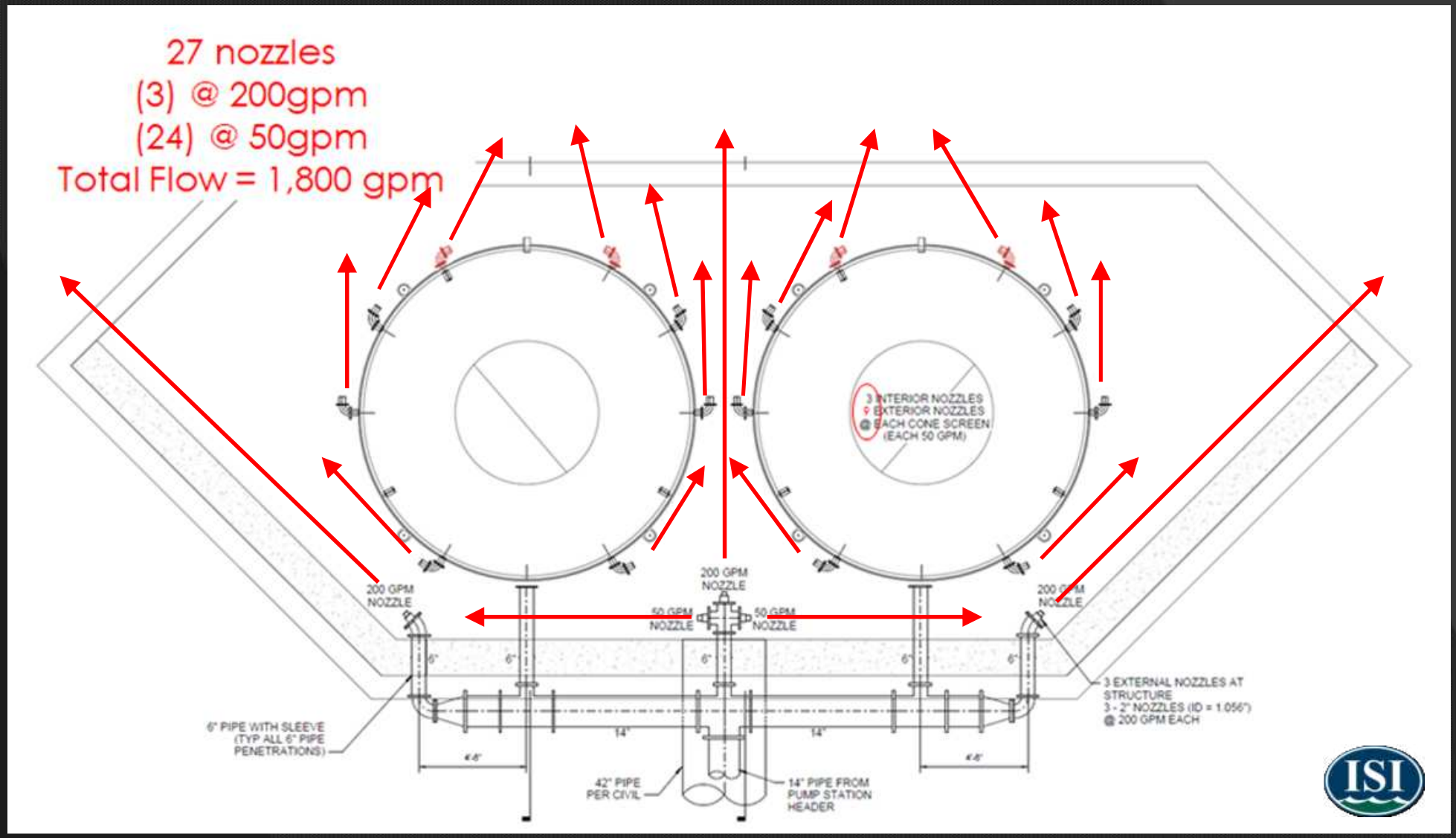
CFD by Stantec



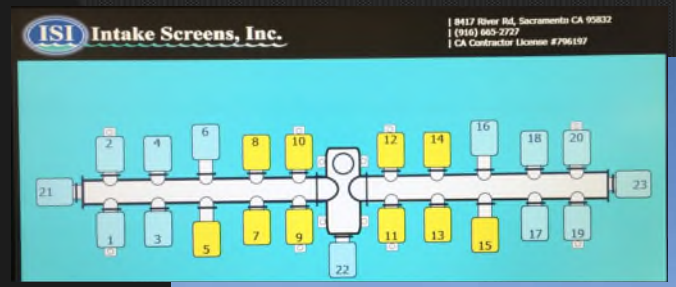
EXAMPLE PROJECT: CPWS DUCK RIVER (SC)



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EXAMPLE PROJECT: LEGRO FARMS (WA)





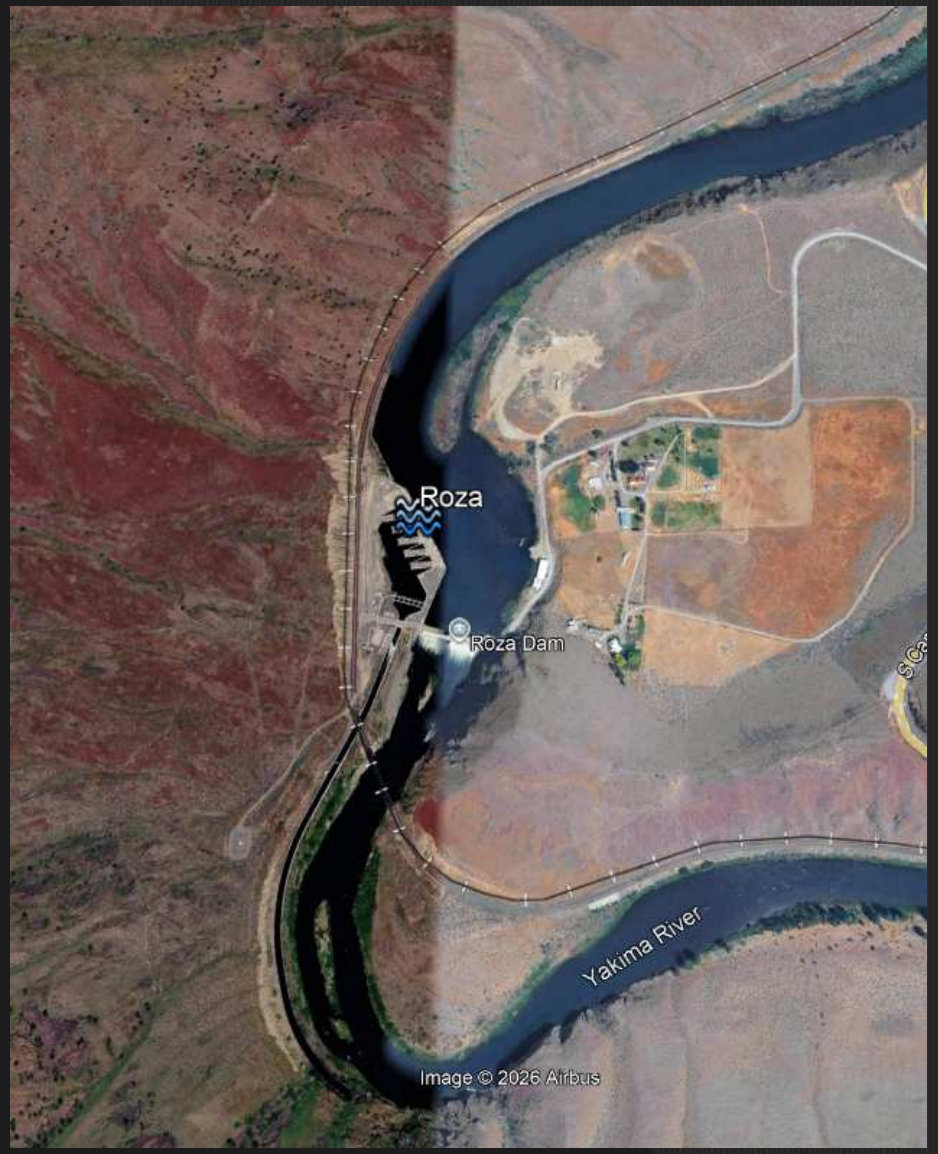
LeGrow Farms Agricultural Intake

EXAMPLE PROJECTS: LEGRO FARMS (WA)



LeGrow Farms Agricultural Intake

EXAMPLE PROJECT: ROZA DIVERSION (WA)





WATER JETTING SYSTEMS





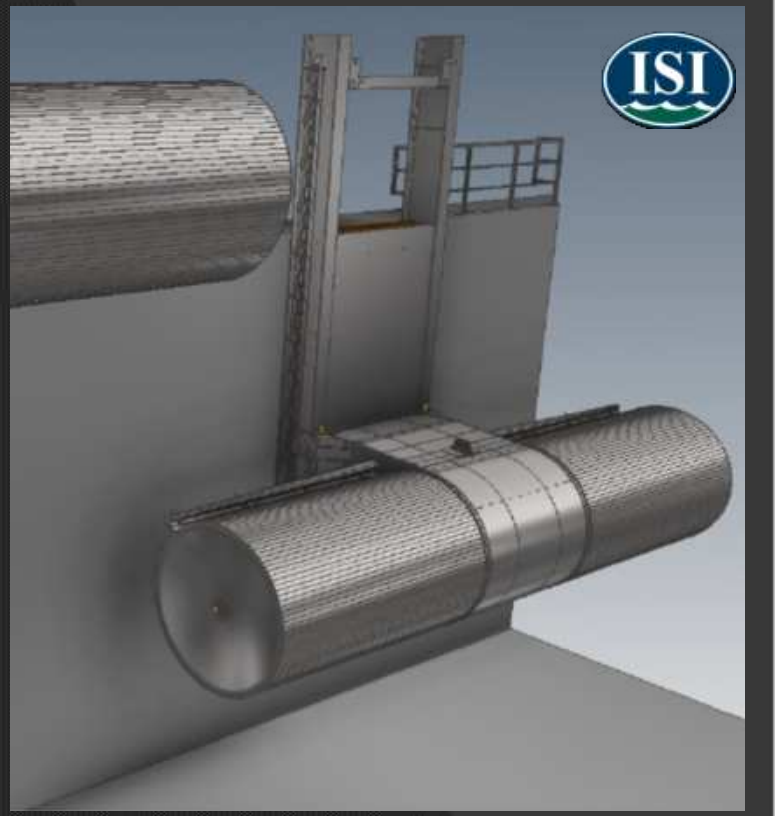


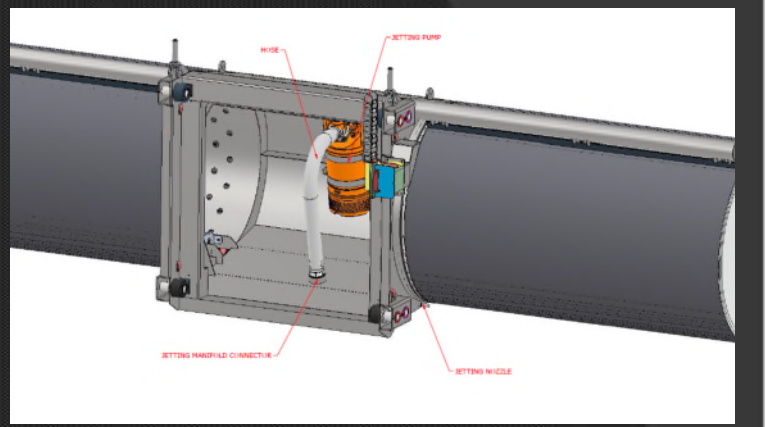
EXAMPLE PROJECT: ROZA DIVERSION (WA)



CLOSING THOUGHTS

- <5% of ISI wedge wire screen systems utilize water jetting
- Water jetting should be considered after exhausting other options
- Water jetting can greatly improve screen system operational reliability which can lead to increased fish protection
- Water jetting can be directed and adjusted; airburst finds path of least resistance to the water surface
- Water jetting can be used to solve challenging sedimentation, surface ice, and general debris issues





Thank You



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