



SAFETY INSPECTION FISH
RIVER ENGINEERING ANA
REVTMENT DESIGN RIVE
FLOODING ANALYSIS SPUI
FLOOD CONTROL SYSTEMS
SCENARIOS SPILLWAYS PC

DAM & WATERSHED ENGINEERING

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Dam & Watershed Engineering

PND has extensive experience in the design and inspection of dam facilities and river engineering. Our experience includes outburst flooding analysis, dam flooding analysis, spur dikes, dike flood control systems, dam impoundments, river diversions, erosion protection, revetment design, scour analysis, low water crossings, and fish habitat improvements (fish passage structures, new habitat, and bioengineering improvements). PND has worked on the design independent external peer review (IEPR) and periodic safety inspections of dams and levees for clients such as: USACE; Federal Energy Regulatory Commission (FERC); Alaska Department of Natural Resources – Dam Safety Division (Alaska DNR); and cities, counties and boroughs throughout the United States. Work has also included design of rehabilitation measures and construction inspection.



JOHN DAY DAM

PND provided structural engineering and navigation criteria for four different draw down scenarios for the Corps of Engineers at John Day Dam, which spans the Columbia River from Washington to Oregon. The dam creates a 76-mile-long reservoir called Lake Umatilla, the longest reservoir on the lower Columbia River. PND's services entailed structural calculations for dam and spillway stability; navigation lock stability; and calculations for slab, wall, and roof sizing for channels, navigation lock, spillway, and powerhouse.

RED DOG MINE DAM

PND provided independent peer review services to evaluate proposed dam modifications to a 60-foot head earth fill dam and cut-off trench consisting of "heat pipes" used to freeze the soil beneath the dam and provide a cut off wall to prevent leaching of contaminants. PND's work also included the evaluation of diversion channel construction with impermeable liner/rock lined channel to minimize heavy metal leaching into the nearby natural stream.



CAMPBELL LAKE DAM

PND performed the geotechnical investigation and dam safety inspection for determination of maximum credible earthquake, seismic evaluation of the dam, liquefaction evaluation, dam break analysis to determine flood impacts for the existing earth-fill dam and spillway structure in Anchorage, Alaska. PND recommended the dam was unsafe and required modification to the spillway structure. Following a flood and failure PND was hired to redesign the spillway, scour protection, sheetpile cut-off wall and outlet works. The new design included facilities for fish passage.

BRADLEY LAKE DAM

PND provided construction management, surveying, field laboratory facilities, and plan review for construction of a hydroelectric dam at Bradley Lake in Homer, Alaska. PND also staffed numerous two and three-person survey crews to resurvey and verify control monuments, construction layouts, grades, concrete placement, original cross sections, tunnel alignments, gate shaft positions, and engineering evaluation of the diversion tunnel.



SQUAW HARBOR DAM INSPECTION

PND provided inspection of an earth-fill dam on Unga Island near Sand Point, Alaska. The 45-foot-high earthen dam featured a concrete cut-off wall that was constructed in the 1970's to supply water to a cannery. PND organized an on-site drilling program and made a number of recommendations regarding future operation of the dam, and a periodic inspection report was prepared and submitted to the Department of Natural Resources.



PETERSBURG UPPER DAM INSPECTION

PND has provided three periodic safety inspections over the last 12 years. Following the last PSI PND provided design and construction inspection services for seepage rehabilitation through the right gravity wall in Petersburg, Alaska.

HUMPBAC KREEK DAM

PND performed an initial inspection of the hydroelectric infrastructure of the Humpback Creek Dam in Cordova, Alaska. The work was performed in support of concepts for future improvements to intake, raceway, scour protection for the Humpback Creek retaining wall, penstock supports, and penstock corrosion. PND also performed bridge condition ratings and made recommendations for repairs.



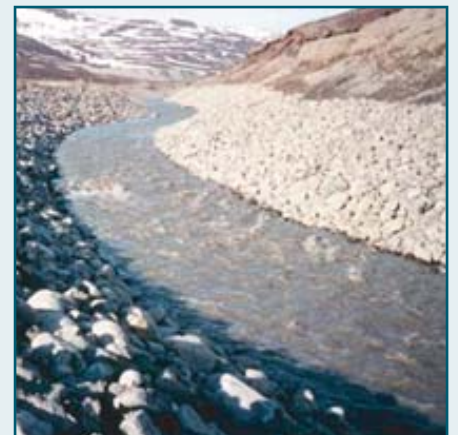
FALSE PASS DAM IMPROVEMENTS

PND provided design and construction administration support for improvements to the water collection dam, water treatment system, and increase of the water storage capacity by addition of another water storage tank. The design report describes the existing water system elements, design criteria, and presents alternatives for the improvements.



VALDEZ CREEK MINE

PND provided design for two 30-foot head earth fill dams in excess of 1,000 feet in length. Work included the design of a 1.5-mile channel to divert a 4,000 cfs creek using impermeable liner and construction on a 25 degree slope. The earthfill dams and diversion channel were constructed to allow mining of a 350-foot open pit mine and the dam was designed to be constructed in winter months with temperatures approaching -30 degrees Fahrenheit. The design of the dams and diversion channel were performed and permitted through Alaska DNR Dam Safety Division. PND also worked on the rehabilitation of the diversion channel restoring the dam to natural conditions following excavation which won a Governor's award for environmental sensitive design. Subsequently, PND was hired to perform a safety review of five tailings dam after a non-inspected 50-foot tailing dam failure.





PND Engineers, Inc., (PND) is a consulting engineering firm that was founded in 1979. The firm has offices located in Anchorage, Juneau, and Palmer, Alaska; Seattle, Washington; Houston, Texas; and Vancouver, BC.

We offer a broad range of civil engineering services, from building structural design to coastal engineering. We are especially proud of our reputation for devising innovative design solutions. Efficiency in design and the resultant savings in construction and operations costs are attractive to organizations that must operate within a stringent financial environment. PND has long enjoyed the challenge of working for such clients.

This brochure outlines innovative riverine and dam projects that PND has worked on throughout the contiguous United States, Alaska, and internationally.



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