

KENNEDY JENKS DESIGNS NEW AND REHABILITATED PONDS FOR BIOLOGICAL TREATMENT AND WATER STORAGE.

Site Civil

- Create planning documents and analyze hydraulics and hydrology to calculate pond size to successfully accommodate needed storage and treatment based on anticipated inputs and outputs, including seasonal water balance and peak precipitation events.
- Design levee restoration measures and erosion controls.
- Prepare earthwork calculations and balancing cut and fill when possible to control project costs.
- Partner with subcontracted geotechnical engineering consultants to evaluate site soils and existing berms/levees to assess stability and identify sub-surface challenges and/or constraints .
- Specify pond bottoms and berms from native and import earth fill materials. Such specifications focus on requirements for fill suitability, moisture and compaction, and spoils disposal.
- Design pond liner systems to reduce the rate of percolation of stored water, reducing the risk of groundwater degradation and negative impacts to nearby water bodies. Liner systems have consisted of clay, concrete, and various synthetics (e.g., HDPE). Various features have been incorporated to support operations and monitoring including access, security fencing, passive venting, leachate collection and leak detection.
- Plan and implement leak detection surveys and liner repairs.



Treatment

- Design civil, mechanical, electrical, and process supporting components for ongoing operation and maintenance of treatment ponds.
- Calculate pond size, dimensions, features, and equipment required to support wastewater treatment objectives. Constituents of concern addressed by biological treatment ponds typically include organics biochemical oxygen demand (BOD) and chemical oxygen demand (COD), total suspended solids (TSS), and nitrogen.
- Calculate constituent loadings, oxygen demands, and aeration capacity required for treatment objectives. Kennedy Jenks is experienced with complete mixed, facultative, and anaerobic ponds, surface and submerged aeration technologies and optimal aerator configuration.
- Design mechanical coarse screens, solids management containment and dewatering, pumps, piping, valves, controls, aeration, dissolved oxygen monitoring and aerator automated controls, level instruments, monitoring wells, intake structures, pond water recirculation systems, and treated effluent polishing and filtration for beneficial reuse.
- Evaluate pond cover options intended to preserve water quality, mitigate odors, and reduce incidental rainfall contributions. Pond covers have ranged from fixed covers to flexible membranes to floating discs/balls.

Permitting

- Negotiate reasonable and sustainable basis of design. Projects must address specific State and local requirements for constructing treatment and storage ponds.
- Identify 100-year flood considerations to avoid potential challenges with permitting and insurance entities.
- Partner with subcontracted cultural and natural resource firms to address resource agency consultation, wildlife and habitat considerations, endangered species, and comprehensive permitting needs.

Contracting and Construction

- Prepare opinion of probable costs for planning and alternatives analysis of pond projects. Kennedy Jenks is familiar with alternate treatment systems and water storage facilities to identify optimal strategy for meeting project goals.
- Prepare bidding documents and evaluate contractor qualifications and bids.
- Support construction as desired by owner. Kennedy Jenks can provide limited support and advice during construction, including review of requests for information, proposed alternative materials, and contractor-proposed changes as needed or serve as the Owner's representative in administering the construction contract in full.

Operations and Maintenance

- Develop standard operating procedures, operations and maintenance manuals, and mitigation measures. Kennedy Jenks is well prepared to support Owners with troubleshooting existing ponds and addressing suboptimal operations including odor, algae and duckweed control , ballooning liners, reductions in treated effluent quality, and excursions from permitted dissolved oxygen concentrations and pH levels.
- Create a recommended disposal and irrigation schedule for pond effluent. Such schedules have considered the disposal location and type (typically land), planted crops, irrigation restrictions, type of distribution system, and loading limits to protect underlying groundwater. Kennedy Jenks models pond water levels for multiple scenarios to assess irrigation schedules relative to pond volume.
- Plan and implement removal of pond residuals and solids. Kennedy Jenks can design an active sludge removal system as part of the pond design or develop a Request for Proposal to perform pond dredging when necessary. Kennedy Jenks is knowledgeable of dredging and dewatering means and methods, disposal options, and typical costs. Kennedy Jenks has also performed solids and sediment surveys to characterize the quantity and quality of solids requiring disposal.





PROJECT EXPERIENCE

Sedimentation Basin

San Francisco Public Utilities Commission, San Francisco Area, CA

Kennedy Jenks designed a 5,000 cubic yard sedimentation basin, culvert replacements, and surrounding habitat management area. The sedimentation basin design involved basin sizing to support the estimated 100-year stream flow volume, preparation of a grading plan, and estimating excavation volumes. The culvert replacement design entailed sizing culvert pipes and designing headwalls and downstream erosion protection measures. The project was in an environmentally sensitive area that provided habitat for two endangered species. Careful consideration and communication with project biologists was required during the design to ensure protection of sensitive habitats.

Recycled Water Reservoir Improvements Project

Napa Sanitation District, Napa, CA

Kennedy Jenks' team led a concepts-review to assess options for satisfying NapaSan's need for increased storage capacity of two onsite recycled water reservoirs. Collaborated with NapaSan engineers to develop the preferred strategy for improving the reservoirs and identify cost-saving opportunities. Kennedy Jenks managed the design of selected improvements consisting of demolition of the existing covers, rework of the reservoir structures and interior slopes, and installation of a HDPE-liner system. Regular communication with NapaSan and its construction manager helped our team understand issues identified in the field and develop recommended response actions to mitigate risks to NapaSan. Kennedy Jenks contributed to the successful project execution on schedule and within budget. Alternative covers were presented to NapaSan and the selected reservoir cover product was below budget expectations and well received by NapaSan staff, particularly from an O&M perspective.

Aerated Lagoons and Ponds

Various Wineries And Food Processing Facilities, CA

Kennedy Jenks designed multiple biological treatment and storage ponds over the past six decades. These projects required general grading and earthwork, construction and restoration of levees, installation of upstream screening and solids management facilities, construction of clay and HDPE-lined containment system with leak detection capabilities, subsurface and surface mechanical aeration, pump stations, conveyance piping and treated effluent filtration and polishing. Kennedy Jenks provided various levels of bidding, permitting, construction support, project closeout, and preparation of completion reports and O&M manuals depending on the needs and budget of the Owner.

Process Wastewater Treatment and Reuse System for Peak Flow of 1.5 Mgd

Large Winery Facility, CA

Evaluated an existing treatment system for a large winery client and designed an improved treatment system consisting of screening, a high rate anaerobic system followed by three 3.3 MG aerobic treatment ponds, biogas recovery and reuse, and polishing and reuse of treated effluent for vineyard and crop irrigation and potential reuse in the winery facility. The project was staged over multiple years and required source control and water conservation evaluations and reduction of salts prior to final reuse of treated effluent. Ongoing communication with various permitting agencies and various evaluations for optimizing the final treatment system was required. Kennedy Jenks helped the client identify various cost saving measures and alternative approaches for consideration. Coordination with equipment vendors and various disciplines was required.

Process Wastewater Storage Aeration Basin and Center Pivot Irrigation System

Large Winery Facility, Madera, CA

Kennedy Jenks designed a 200,000 gallon process wastewater storage sump, rotary screen, aeration and mixing system, double HDPE liner and leachate recovery system, various pump stations, and center pivot distribution system to apply treated winery process wastewater to irrigate field cover crops. Prepared a post-construction documentation report and operation maintenance manual. Based on success of the first design, the winery authorized the design of a second sump and process water distribution system

Wastewater Pond Liner System

Confidential Client, Santa Rosa, CA

Kennedy Jenks developed a transition and operating plan for a winery's implementation during construction of pond liner systems in two of five existing process wastewater treatment ponds. Project required evaluation of process wastewater quantities and quality, existing system storage and treatment capacities, and discharge limits to recommend a plan for temporary management of process wastewater with limited treatment capacity during construction of the liner system in two of the ponds. The interim operating plan helped the winery manage process wastewater during construction of the liner with no excursions from discharge requirements.

Pond System Modeling

Various Wineries, CA

Kennedy Jenks prepared various hydrologic models simulating volumetric changes in treatment and storage pond systems under multiple scenarios with varying process water, storm water, evaporation and evapotranspiration, and irrigation flow quantities. The models were used to assess the systems' ability to manage existing and future process water and storm water flows and estimate additional storage requirements. The simulations facilitated planning and decision-making processes for increasing pond system capacities to match tentative facility expansions.



More Information

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