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WHITE PAPER / **COAL COMBUSTION RESIDUALS POND CLOSURES**

AN INTEGRATED TEAM DRIVES SUCCESSFUL COAL POND CLOSURES

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Coal-fired power plant owners and operators are closing ponds that have long-stored coal combustion residuals (CCRs). These pond closures are complex and have impacts far beyond the pond's banks, demanding an integrated team of engineering and environmental professionals to customize effective, compliant solutions.

Closing a CCR pond is highly complex. Individual ponds often vary in significant ways, requiring careful assessments of multiple site-specific variables that can affect final design and construction. Pond size, CCR composition, environmental and community impacts, schedule and budget parameters, plant outages, operations, and post-closure land use are among the many factors that must be considered. All can impact the cost, success and long-term sustainability of the completed project.

The multifaceted nature of these projects calls for owners to involve environmental and engineering professionals — whether internal staff or outside consultants — on the project team from the earliest stages of these projects. Successful project execution depends on the team's ability to understand various regulatory requirements triggered by pond closures and integrate them into every stage of the project, from schedule and engineering design to bid specification development and construction. Potential impacts to plant operations and plant permit conditions must also be considered.

ANATOMY OF A CCR POND CLOSURE

In most cases, water in CCR ponds must be removed so that the pond can either be excavated or closed in place using advanced engineering methods and technologies. In some cases, the water is reused in plant processes. In others, it is treated and discharged into nearby waterways.

All these activities must comply with strict CCR and effluent limitation guidelines (ELG). They also have the potential to conflict with a coal-fired power plant's existing air, water, hazardous waste, National Pollutant Discharge Elimination System (NPDES) and other permits. If a pond is in close proximity to wetlands, rivers or streams, for example, a closure project may require U.S. Army Corps of Engineers (USACE) and state agency approval. Pond closure design may also trigger the need for additional federal, state and local permits.

Some permits can take up to a year or more to obtain or modify, making them a significant driver in a closure project's construction schedule. A permit delay can significantly impact schedules driven by plant outages and negatively impact a plant's regulatory compliance.

THE CONVENTIONAL APPROACH TO POND CLOSURE

Before the permitting process can begin, the owner must file a closure plan. These closure plans — made available to the public — establish a starting point for the engineering of dewatering, closure alternatives assessments and other construction activities related to pond closures. In many cases, these plans are created by engineers.

Environmental consultants typically only support pond closure efforts once the conceptual design is complete and engineers have worked with the owner to narrow their closure choices. If dewatering of the pond is in the scope, an environmental professional will help obtain the necessary permits. In this approach, their role is primarily reactive.

AN INTEGRATED APPROACH TO POND CLOSURE

Consider, however, the added value and efficiencies that can occur if project engineers and environmental consultants collaborate during the early conceptual stages of a project when multiple closure alternatives are under consideration. Such collaboration can allow a team to:

IDENTIFY PERMITTING TRIGGERS

Perhaps the greatest value that an environmental consultant can add in a pond closure project is early guidance on how to minimize permit requirements and potential impacts to other environmental permit requirements. When conceptual design is just 30% complete, an experienced consultant with deep understanding of permitting rules can often determine the permit requirements each design alternative would trigger. In some cases, they may be able to suggest ways to design around these triggers.

Consider, for example, a CCR pond that is located near a river. If a portion of the work is required in or near a river levee, it can trigger the need for USACE approval, a permitting process that requires substantial lead time. An experienced environmental consultant may recommend ways to avoid areas under USACE jurisdiction. If the site can't be avoided, they can at least provide the project engineers with advanced knowledge

so the impacted work can be scheduled for later in the construction schedule when the necessary permits are obtained.

Likewise, consider a CCR pond located near wetlands that can only be reached by access roads. If heavy equipment must be moved to the site for dewatering activities, it could impact the wetlands. Working alone, an engineer designing the closure may simply identify the access road. With an environmental consultant at the table, the result may involve a new way to access the pond or a new location for water lines to minimize or eliminate wetland impacts.

Environmental consultants can also inform the writing of permit applications to include applicable information and omit irrelevant information that might raise unwarranted red flags. Experienced consultants may be able to forestall regulatory concerns and address them in ways that help streamline agency negotiations.

WEIGH COST VS. SCHEDULE TRADE-OFFS

Owners should weigh potential time and cost impacts when making important pond closure decisions. A project team that includes both engineering and environmental professionals can help facilitate discussions and decision-making with information on how individual design alternatives impact total project costs and overall schedules.

One alternative may cost more to construct than another. Limited understanding of permit processes and applicability can lead to scheduling delays, added cost and increased regulatory scrutiny. These unintended consequences not only jeopardize pond closure success but also could impact plant operations.

When a well-defined permit process is established early in the process, the project team is likely to minimize any unexpected costs or schedule delays. An environmental consultant can also help an owner determine if the additional time regulators need to approve a design alternative is worth the capital cost savings it might offer. Experienced environmental permitting staff also can efficiently prepare the necessary agency form to expedite permit approvals.

IMPROVE DESIGN QUALITY

An integrated team of engineering and environmental professionals can work together to create pond closure design solutions that cost less, minimize plant impacts and achieve superior performance. For example, an engineer working alone may consider dewatering a pond by running the water through the plant and discharging it through an outfall. An environmental consultant may point out that, depending on the water quality, such an approach may violate a NPDES permit. Working together, they might develop a plan to consider treatment options that minimize potential exceedances as well as avoid other NPDES permit limit exceedances as part of daily operations.

An environmental consultant can help plants factor pond closure needs into their NPDES permit renewals. Plants complete the renewal process every five years. Many then seek a modification due to a pond closure — a process that can require up to 12 months of lead time. It usually makes better economic and operational sense to look ahead and consider how a pond closure could impact a NPDES permit. Incorporating pond closures into the renewal process can save time, money and eliminate potential delays down the road.

RECEIVE CCR POND CLOSURE EXTENSIONS

The U.S. Environmental Protection Agency (EPA) is currently reviewing comments on the proposed rules for CCR pond closures. Deadlines for initiating these projects also continue to be adjusted, with extensions available to owners that demonstrate their efforts to develop alternative capacity.

While permits may not be needed prior to demonstration projects, the EPA may not accept requests for extensions without them. Consider, for example, a power plant's air permit as it relates to construction dust from truck traffic. As with any power plant construction project, additional emissions associated with construction activities could potentially trigger Clean Air Act requirements, such as prevention of significant deterioration (PSD). The CCR request for extension requires owners to evaluate a project's overall schedule, including major milestones. Based on the selected pond closure strategy, an evaluation of potential air quality concerns related to construction

and other plant operations (e.g., dry ash conversion) need to be considered. A construction PSD permit to install/permit to operate (PTI/PTO) may be required, which can potentially take several months for agency review and approval.

IMPROVE BID DOCUMENT QUALITY

Bid specifications drive how a contractor will execute the pond closure work. When engineering and environmental teams collaborate, bid specs can be more specific and complete, describing the regulatory and permitting requirements the contractor will be expected to meet. The resulting bid package will leave few openings for contractors to claim ignorance of an unmentioned wetland or water discharge alternative. Closing potential loopholes helps contribute to successful execution.

Owners also benefit from the knowledge that all contractors are bidding on the same scope of work, as outlined in the permit, rather than developing their own construction plan. This results in bids that can be more easily compared.

THE BOTTOM LINE

CCR pond closures are complex projects whose schedules are often driven by regulatory deadlines. To successfully mitigate the environmental risks associated with these projects, coal-fired power plant owners and operators need custom-engineered solutions that comply with a range of federal, state and local regulations. By engaging integrated teams of engineering and environmental consultants, plants can prudently achieve their CCR pond closure goals.

BIOGRAPHIES

MATT BLEYTHING, PE, is an associate civil engineer with experience in the civil design and project management of power projects. In recent years, he has focused on CCR projects and helping utilities develop strategies to remain in compliance with CCR rule requirements. This includes developing studies, cost estimates, schedules, compliance documents, detailed design and construction oversight for landfills, CCR pond closure by removal and CCR pond cap in place projects.

DANIEL JELINEK, REM, is an environmental manager with experience in environmental liability assessments, site remediation, regulatory compliance and risk mitigation. He serves as an account manager for several large utility, energy, and oil and gas companies. Daniel is focused on supporting utility clients as they assess the regulatory, legal and financial risk with potential groundwater contamination associated with CCR units, as well as providing environmental permitting support related to CCR unit closure strategies.

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