

Nuclear

Client

Maine Yankee Atomic Power Company

Connecticut Yankee Atomic Power Company

Location

Wiscasset, Maine ; Haddam Neck, New Jersey USA

“CH2M HILL is doing a job second to none in their support of Site Restoration at Maine Yankee. They have provided tireless professionals who have helped us achieve a level of success in the permitting and RCRA areas that we never dreamed of 2 years ago. They are knowledgeable, conscious of cost and schedule and highly respected by their peers and our regulatory stakeholders. They are great people from a great company helping a great Maine Yankee team.”

Wayne Norton
President, Maine Yankee Atomic Power Company

Commercial Nuclear Reactor Decommissioning Support

The decommissioning of nuclear facilities presents a wide variety of contaminants and challenges – ranging from standard industrial hazards such as lead, asbestos and PCBs to more specific hazards of mercury and beryllium to radioactive contamination involving many different isotopes. CH2M HILL has extensive hands-on experience with the deactivation, decontamination and demolition of multiple hazard facilities at various U.S. Department of Energy Sites, commercial reactor sites and government facilities. CH2M HILL has fully decommissioned more than 4 million square feet of facilities, making it the nuclear industry’s leading facility decommissioning contractor. In addition, we have provided environmental support to commercial nuclear power plant decommissioning projects, including Maine Yankee and Connecticut Yankee.



Maine Yankee

Maine Yankee Atomic Power Company contracted with CH2M HILL to provide environmental restoration and remediation support associated with the decommissioning of its nuclear facility in Wiscasset, Maine, along with termination of the plant’s NRC operating license. The project represents one of the first large-scale nuclear plant decommissioning projects in the country and involves ground-breaking regulatory decision making. One of CH2M HILL’s key roles for this project involves working with regulators to streamline regulatory processes and negotiate closure requirements on behalf of our client, saving the client millions of dollars.

Maine Yankee began commercial operation in December 1972 and has operated in the present location for approximately 26 years. The plant permanently ceased operation as an electricity generator in August 1997, but continues to operate a spent nuclear fuel storage facility. The plant is currently in the process of decommissioning, which will involve the demolition and removal of most existing structures on the site. A new facility for dry cask storage of used nuclear fuel and greater than Class C radioactive waste is currently under construction.

In decommissioning the nuclear facility, Maine Yankee is faced with completing one of the most challenging projects in the country. Not only is the project highly complex, but it is one of the first large-scale nuclear power plant decommissioning projects of its kind, and its successful completion will serve as a benchmark for similar projects to follow. Maine Yankee is self-performing decommissioning and environmental restoration activities, which has required it to manage a number of project challenges outside of its traditional area of expertise. Maine Yankee contracted with CH2M HILL to work collaboratively as part of the decommissioning team, including assigning staff to the Maine Yankee location. Specifically, CH2M HILL is providing regulatory, re-use, and program management support to Maine Yankee Environmental Remediation and Restoration Group.

CH2M HILL is managing the RCRA program in support of decommissioning activities, which includes screening and evaluating applicable regulatory requirements to develop and implement a RCRA Facility Investigation (RFI),



human health and ecological risk assessments, Corrective Measure Study (CMS), and Corrective Measure Implementation (CMI). Prior to CH2M HILL's involvement, an Ecological Risk Assessment Work Plan was prepared by another consultant. We modified the original Work Plan to reflect a phased approach. This approach eliminated over 30 unnecessary toxicity tests and benthic community structure analyses, providing a substantial cost savings to MYAPC. CH2M HILL also prepared the full ecological risk assessment. In addition, we developed the cumulative risk assessment, which will evaluate both radiological and non-radiological impacts to human health and the environment. The cumulative risk assessment will be used to support site closure decisions.

CH2M HILL had a significant impact in helping MYAPC improve their regulatory approval process. We screened and evaluated applicable regulatory requirements, lead the engineering evaluation, and developed the permitting approach for decommissioning the facility water circulation and discharge system. We worked with MYAPC and the regulatory stakeholders to develop and implement cost-effective alternatives that will protect of public health and the environment. CH2M HILL secured approval from the U.S. Army Corps of Engineers and Maine Department of Environmental Protection (DEP) for removing a portion of the system in accordance with the Natural Resource Protection Act (NRPA). The approval was obtained with minimal regulatory comments on the permit and in significantly less time than anticipated by MYAPC.

We are assisting MYAPC in identifying cost-effective alternatives to existing disposal options. We are screening and evaluating applicable regulatory requirements and exploring options to use CH2M HILL's global leverage with waste disposal facilities to provide MYAPC with less costly alternatives to their existing disposal options.

In addition, CH2M HILL managed the decommissioning of the Forebay structure associated with the plant discharge system. The radiological and non-radiological aspects of the Forebay D&D, in addition to the significant interest from stakeholders, made the Forebay D&D one of the highest profile aspects of the overall decommissioning project.

Forebay was part of the liquid waste discharge system that was located on the south end of Bailey Point adjacent to Foxbird Island at the Maine Yankee site. The structure consisted of two, 225-foot, north-south oriented dikes that connected Bailey Point to Foxbird Island to the south. The dikes formed a containment structure that received large volumes (up to 420,000 gallons per minute) of circulating and service water and liquid effluents from the power reactor. The water from the Forebay flowed to buried piping on Foxbird Island that carried the water to a submerged diffuser system in Montsweag Bay, south of Foxbird Island. In support of site decommissioning activities, CH2M HILL completed the Forebay remediation in December 2003. Remediation activities included removal of the upper ten feet of both dikes; removal of approximately 977 cubic yards of sediment contaminated with Cs-137, Co-60, Petroleum, PCBs, TCA, PAHs, lead, mercury, and sodium; and backfill and grading. Upon completion of the grading and filling

activities, the west dike of the Forebay was breached to form an upland marsh/wetland.

Connecticut Yankee

CH2M HILL is providing several environmental remediation and construction services in support of Connecticut Yankee Atomic Power Company's (CYAPCO) ongoing NRC license termination and D&D at their Haddam Neck nuclear power station in Connecticut.

CH2M HILL is managing the Connecticut Yankee sitewide groundwater program. Contaminants of interest at CYAPCO include both radioactive (e.g., tritium, strontium-90, cesium-137) and non-radioactive constituents (e.g., boron). Assessment of groundwater conditions includes evaluating the effects of natural uranium and related daughter products. We are providing assessment and maintenance of a network of over 50 monitoring wells, and design and installation of new and replacement wells in unconsolidated and bedrock formations up to 600 feet deep.



We are also managing characterization of radionuclide-contaminated soil and bedrock. This activity includes identification of known and potential sources and release area, design and implementation of subsurface characterization (including soil and bedrock characterization), and interpretation and reporting/recommendations for source removal actions. Innovative techniques included use of direct push soil sampling coupled with co-located groundwater grab samples to support assessment of contaminant distribution coefficients, and use of down-hole gamma spectrographic analysis of bedrock fractures.

CH2M HILL is providing design, construction oversight, startup support, and maintenance and operation for dewatering/groundwater depression systems required to facilitate demolition and removal of deep underground structures (some structures are built as much as 42 feet below ground surface). We removed approximately 20,000 cubic yards of soil contaminated with radionuclides and other plant-related constituents as part of dewatering activities.

We are also providing regulatory support associated with groundwater closure to CYAPCO. CH2M HILL is in the process of completing successful negotiation with the State of Connecticut on groundwater closure criteria. CH2M HILL has participated in a series of monthly meetings and conference calls with the Connecticut Department of Environmental Protection (CTDEP), U.S. EPA and U.S. NRC. These meetings have helped build trust with regulators and resolution on a number of complex technical and regulatory issues.

Technical support for waste characterization and waste designation includes characterization of PCB containing paints, asbestos-containing materials, potentially-mixed wastes and other "problem" waste streams. Approximately 2000 tons of steel have been assessed for disposal.

We are also providing technical support to revise site stormwater management permits and supporting plans, including identifying needed modifications to existing storm-water control systems (such as ditches and



yard drains) and conceptual design support for wastewater treatment systems required to meet discharge limits during dewatering, and storm water management during demolition.

We also modelled groundwater contaminant fate and transport.