

# RETHINKING WASTE...<sup>®</sup>

everything from waste management  
to resource recovery



Civil & Environmental Consultants, Inc.

# THE CEC ADVANTAGE

*What sets CEC apart is that we put ourselves in our clients' shoes and make recommendations from their strategic vantage points. These are the real differentiators:*

## INDUSTRY EXPERTS

CEC strategically adds former solid waste company professionals who drive us to deliver services from the owner's perspective.

## THOROUGH DUE DILIGENCE

Through our financial, environmental, and operational due diligence services, CEC examines all aspects of a solid waste business or facility as they relate to future successes or potential liabilities.

## EXPANDED OPERATIONS SUPPORT

CEC focuses on elements integral to operations, including facility access and traffic flow, transfer logistics for trucking or rail operations, and detailed analyses and review of potential or existing site nuisances. We also offer a landfill university course for new operators and managers.

## UNIQUE PROBLEM-SITE RESOURCES

To address problem sites, CEC engineers and scientists develop short-fuse plans and actions designed to achieve the owner's long-term strategies.

## SPECIALTY WASTE ANALYSIS

CEC evaluates new wastes for acceptance considering both short-term financial benefits and potential long-term liabilities for facility owners.



**1:** New maintenance garage and office complex for a waste hauling company in Wheeling, West Virginia.

**2:** A 93,000-square-foot material recovery facility operation in St. Louis.

**3:** A 500-tons-per-day solid waste transfer station and recovery facility in Lawrence County, Ohio.



## The solid waste industry finds itself in transition: from managers of waste to providers of resources and energy.

The industry now manages each ton of waste as a valuable commodity; determining what is recyclable, what is recoverable, what can be utilized as a source of energy, and what is to be landfilled.

The strategic recruitment and hiring of professionals from solid waste companies enables CEC to harness a wealth of direct industry experience. These seasoned experts are able to deliver services, as well as prepare reports, permit applications, and designs from the owner's perspective, allowing CEC to effectively advocate for our solid waste clients.

CEC offers managers, owners, and operators valuable efficiencies through our integrated approach, complete set of services, and wide range of technical staff and industry experts under one roof.

### CEC OVERVIEW

*Civil & Environmental Consultants, Inc. (CEC) provides comprehensive market-oriented consulting services that advance the strategic business objectives of our clients. CEC is recognized for its innovative design solutions and integrated expertise in air quality, civil engineering, ecological sciences, environmental engineering and sciences, manufacturing infrastructure services, survey/geospatial, waste management, and water resources.*

*Our Solid Waste Market Group is a diverse team of engineers, scientists, and professionals who serve as our conduit to the latest thinking and advancements in the solid waste industry, providing clients with concise, timely information and regulatory updates to facilitate informed decision-making.*



# FACILITIES & LANDFILLS

Transfer stations, collection facilities, Material Recovery Facilities (MRFs), and landfills all are developed and designed to combine operational flexibility with the ability to respond to changes in waste flow, market conditions, and regulatory constraints.

## SITE MAXIMIZATION

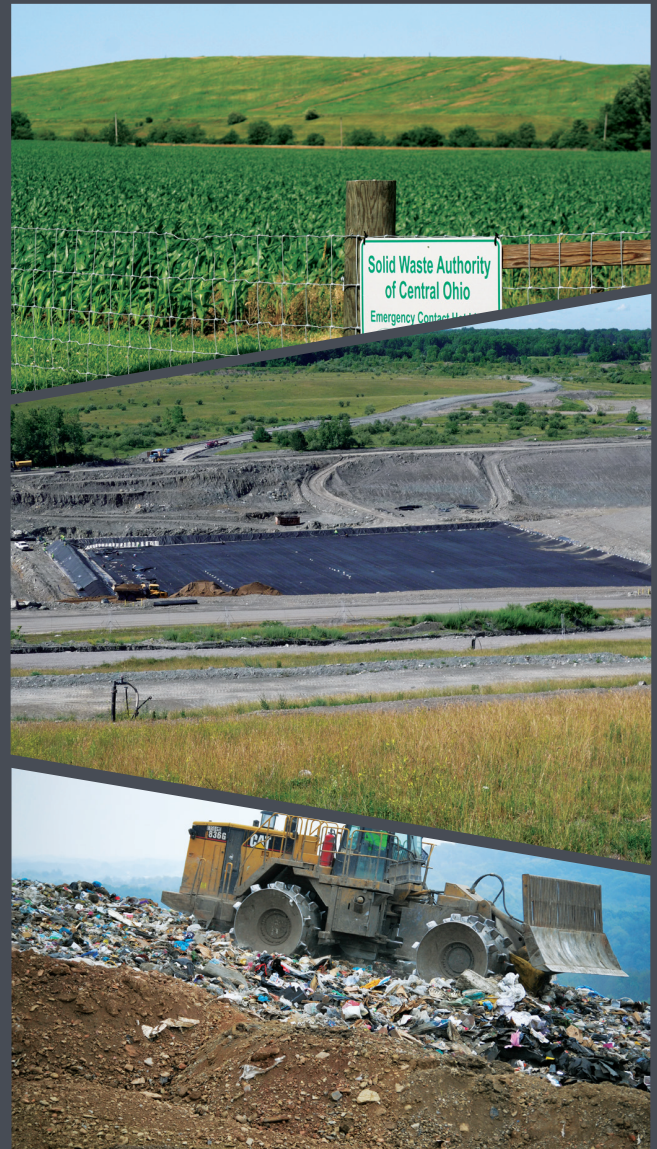
To determine optimal site and facility strategies, CEC examines engineering, environmental, and ecological issues, taking into account design and construction constraints, zoning requirements, and current and future operational requirements. CEC is able to successfully negotiate with all stakeholders during the permitting process, leading to facilities that maintain good working relationships with regulators and surrounding municipalities.

## DIVERSE DESIGN CAPABILITIES

CEC engineers focus on elements integral to operations, including functional facility access and traffic flow for loading and unloading, transfer logistics for trucking or rail operations, volume of intake, and the necessary types of heavy equipment. For landfills, CEC's engineering designs and operating measures allow for the accommodation of materials ranging from municipal solid waste to natural gas and industrial wastes to coal combustion residuals.

## LANDFILL GAS SERVICES

In addition to designing systems to properly collect and contain landfill gas, CEC studies renewable energy market drivers, project financing, and contractual issues to offer the right combination of technical, financial, and legal expertise necessary to LFGTE project development and implementation.



**1:** One of the largest publicly owned and operated landfills in the U.S., accepting 3,600-4,000 tons of municipal waste per day.

**2:** A deployed 60-mil High Density Polyethylene (HDPE) geomembrane at a municipal landfill cell in northeast Ohio.

**3:** This 1,800-tons-per-day Pennsylvania landfill benefits from comprehensive permitting services.



# TECHNOLOGIES

To reduce the cost of regulatory compliance, CEC utilizes technologies to efficiently process waste, manage leachate and landfill gas, and manage and access data.

## LEACHATE MANAGEMENT AND TREATMENT

CEC plans, designs, and implements treatment systems for landfill leachate, as well as for gas extraction well condensate and dewatering liquids. Pretreatment facility expertise ensures permissible discharge of leachate to off-site treatment plants.

## DATA MANAGEMENT SYSTEMS

One size does not fit all for data solutions. CEC develops data management systems that meet the individual needs of our industry clients.

## CONVERSION TECHNOLOGIES

The technology and economics of conversion applications are analyzed, including identifying the effort needed to capture and convert material. Justifying the investment requires verifying a dependable feedstock, identifying markets for recovered material, and estimating costs associated with processing.



**1:** On-site 100,000-gallon-per-day leachate pretreatment facility in Murfreesboro, Tennessee.

**2:** CAT generators create electricity at a new 6,700-square-foot Landfill Gas-to-Electric plant in northeastern Ohio.

**3:** Two 285,000-gallon storage tanks featuring glass-coated, bolted steel plate shell construction with cathodic protection.

## **DUE DILIGENCE**

Feasibility Studies and Site Selection  
Property Development Evaluations  
Phase I & II Environmental Site Assessments  
Environmental and Financial Due Diligence Services  
Permit Adequacy Reviews and Audits

## **DESIGN AND PERMITTING**

Stormwater and Water Quality Management  
Ecological Evaluations and Permitting  
Cultural Resources Evaluations  
Geotechnical and Hydrogeologic Investigations  
Conceptual Design and Preliminary Engineering  
Closure, Post-Closure, and Financial Assurance  
Design of Landfill Components

## **CONSTRUCTION-RELATED SERVICES**

Cost Estimates, Bid Documents, and Specifications  
Design-Build Services  
Construction Quality Assurance and Testing  
Construction/As-Built Surveys  
Construction Coordination and Management Services

## **FIELD SERVICES**

Treatment System O&M  
LFG O&M  
Design-Build System Repairs

## **REGULATORY COMPLIANCE**

Environmental Management Systems  
GIS/Telemetry  
Groundwater Sampling/Monitoring/Mitigation  
Leachate Sampling/Monitoring  
Landfill Gas Compliance Management

## **OPERATIONS CONSULTING**

Financial Modeling for Solid Waste Management Facility  
Operations  
Operational Optimization Audits  
Production Recordkeeping and Tracking  
Facility Staffing and Personnel Training

## **LEACHATE MANAGEMENT AND TREATMENT**

Leachate Collection and Removal System Design  
Pump Station and Force Main Design  
Minimization and Alternatives Assessment  
Bench-Scale Testing and Evaluation  
Treatment Systems Design  
Construction Support Services

## **LANDFILL GAS (LFG) SERVICES**

LFG System Design  
Air Permitting, Compliance, and Modeling Services  
LFG Renewable Energy Project Development Support  
Specialized Construction Services  
Wellfield Operations and Management

## **WASTE PROCESSING AND CONVERSION TECHNOLOGIES**

Waste Minimization Studies  
Composting  
Anaerobic Digestion

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