Civil & Environmental Consultants, Inc.

AIR EMISSIONS TESTING

OWNER/CLIENT

Cemex, Inc.

LOCATION

Louisville, KY

CEC SERVICES

Air Emissions Testing

OWNER OBJECTIVE

Cemex, Inc. is an international corporation and one of the largest Portland cement manufacturers in the U.S., with 12 operating plants. The EPA imposed a new rule on Portland cement manufacturers that required the installation of particulate monitors on stacks to monitor particulate emissions.

Cemex hired CEC to perform annual compliance stack testing to ensure its plants are operating within their operating permit limits. Cemex needed to install high-efficiency bags in its baghouses, but the emissions were so low that a reasonable set point limit on the particulate monitor could not be achieved.

CEC APPROACH

To help achieve a reasonable set point limit, CEC worked with Cemex to develop a method that would inject particulate into the stack to increase its emissions during the stack test, which enabled a higher set point on the particulate monitor. CEC also wrote a test protocol describing how the particulate injection system would be operated. The protocol was presented to the local agency and accepted as an alternate test method for particulate.

The Cemex plant passed all its compliance stack tests, and the test data provided by CEC was accepted by the local agency. Providing this data for Cemex allowed the company to continue its manufacturing process without permit modifications or changes in production.

Civil & Environmental Consultants, Inc.

STATIONARY SOURCE TESTING

OWNER/CLIENT

Johnson Controls Battery Group, Inc.

LOCATION

Holland, OH

CEC SERVICES

Air Emissions Testing: Methods 5/12 (Particulate/Lead)

Air Emissions Testing: Method 9 (Visible Emissions)

Point Source Sampling Location

Mobile Air Quality Laboratory

OWNER OBJECTIVE

Johnson Controls Battery Group, Inc. (JCI) is the world's largest automotive battery manufacturer and has more than 100 years of experience providing batteries to automotive manufacturers and aftermarket distributors and retailers across its global footprint.

JCI's Holland, Ohio facility manufactures automotive and marine lead acid batteries. This facility's battery production encompasses every aspect of the production cycle: lead oxide formation, plate pasting, cast-on-strap, plate curing, final assembly, cleanup by a central vacuum system, and shipping of the original equipment manufacturer OEM and aftermarket batteries. The Holland plant has approximately 120 permitted air emission sources by the Toledo Department of Environmental Services (TDES). JCI's objective was to perform permit expiration compliance testing and the required Corporate Power Solutions monitoring of the 34 point-source emissions with permits expiring in 2019.

CEC APPROACH

JCI has standardized its source emissions testing by employing a single vendor, CEC, for its test programs. CEC mobilized eight Qualified Source Testing Individuals (QSTIs) and two mobile laboratories to support the Holland test program. Two JCI environmental engineers and six environmental specialists from TDES were present to facilitate, observe, and validate the test proceedings, which included field sampling, mobile laboratory analyses, and visible emission observations.

Over a two-week period, CEC staff performed U.S. EPA Methods 5/12 and 9 (lead/particulate matter and visible emission observations) sampling and analysis for 29 of 34 stationary sources for permit expiration compliance determination.

The mobilization for JCI Holland project was the largest single project that JCI and CEC have performed in more than 40 years of its source testing partnership.

A2LA/STAC AETB Accredidation

Civil & Environmental Consultants, Inc.

FLOOD CONTROL AND USACE LAND EXCHANGE PHASE I ARCHAEOLOGICAL SURVEY

OWNER/CLIENT

A.O. Smith Corporation

LOCATION

Ashland City, TN

CEC SERVICES

Archaeological Investigations

OWNER OBJECTIVE

Under contract with A.O. Smith Corporation (AOS), CEC completed a Phase I archaeological investigation for the proposed AOS flood control and USACE land exchange on the floodplain of the Cumberland River just west of the AOS plant. The purpose of the investigation was to determine if any cultural resources will be impacted by the proposed project. The project area consists of 5.3 acres [ARPA permit DACW62-4-16-0203] of USACE owned land and 47.8 acres of AOS owned land.

CEC APPROACH

Two sites were investigated during this study, 40CH81 and 40CH206. Site 40CH81 was previously recorded and 40CH206 was recorded by the current investigation. Site 40CH81 is a large, dense prehistoric field camp or village associated with the Early/Middle/Late Archaic, Middle/Late Woodland, and Mississippian periods on a small rise in the Cumberland River/Marrowbone Creek floodplain. The site was revisited during the AOS flood control project to determine if the northern boundary could be located and if it was possible to determine whether the site encroached into the current AOS project area. Based on the current investigation 40CH81 does not extend into the AOS project area. The site is potentially eligible for the NRHP.

Site 40CH206 is a small, dense prehistoric artifact scatter on a slight rise above the floodplain of the Cumberland River on a terrace/footslope landform. The dense artifact assemblage and wider range of activities suggest that 40CH206 represents a field camp associated with at least the Middle Woodland period. Consequently, 40CH206 is recommended potentially eligible for the NRHP and pending consultation with the USACE further investigations may need to occur.

Based on the geomorphological investigations, archaeological resources over the project area will be at or near the ground surface. No buried surfaces with the possibility of containing cultural resources were observed. No further work was recommended for the AOS project area.

Civil & Environmental Consultants, Inc.

THREATENED AND ENDANGERED SPECIES HABITAT MAPPING

OWNER/CLIENT

Penn Wind LLC

LOCATION

Pennsylvania

CEC SERVICES

Endangered Species Consultation

Agency Coordination

Geographic Information Systems (GIS)

OWNER OBJECTIVE

Penn Wind, LLC (Penn Wind) specializes in the erection, maintenance, and technical advising of utility size units for renewable energy developers, wind turbine manufacturers, and wind farm owners. CEC was contracted by Penn Wind to provide professional ecological services, agency consultation support, and project coordination for the proposed Buck Mountain Wind Farm located in Schuylkill, Columbia, and Luzerne Counties, Pennsylvania.

CEC APPROACH

CEC prepared an Action Plan to address Indiana bat (Myotis sodalis) issues associated with the development of a wind farm in northeastern Pennsylvania. The Action Plan was prepared prior to meetings with the U.S. Fish & Wildlife Service (USF&WS) and the Pennsylvania Game Commission (PGC) to discuss potential impacts to the federally endangered Indiana bat. The Action Plan included several project alternatives and mitigation/conservation measures. CEC coordinated and facilitated USF&WS and PGC discussions and provided strategic planning throughout the process.

In addition, CEC used GIS to prepare project maps that identified potential and confirmed endangered bat habitats, the location of mine portals, and mist net trapping sites within the project area. The mapping also identified potential endangered bat habitat mitigation and potential preservation areas. CEC's GIS and mapping services were provided to support the bat action plan.

Civil & Environmental Consultants, Inc.

RISK MANAGEMENT PLANS FOR MULTIPLE MANUFACTURING FACILITIES

OWNER/CLIENT

Kraft Foods North America, Inc.

LOCATION

Northfield, IL

CEC SERVICES

Risk Management Plan, Multiple Plants

Geographic Diversity

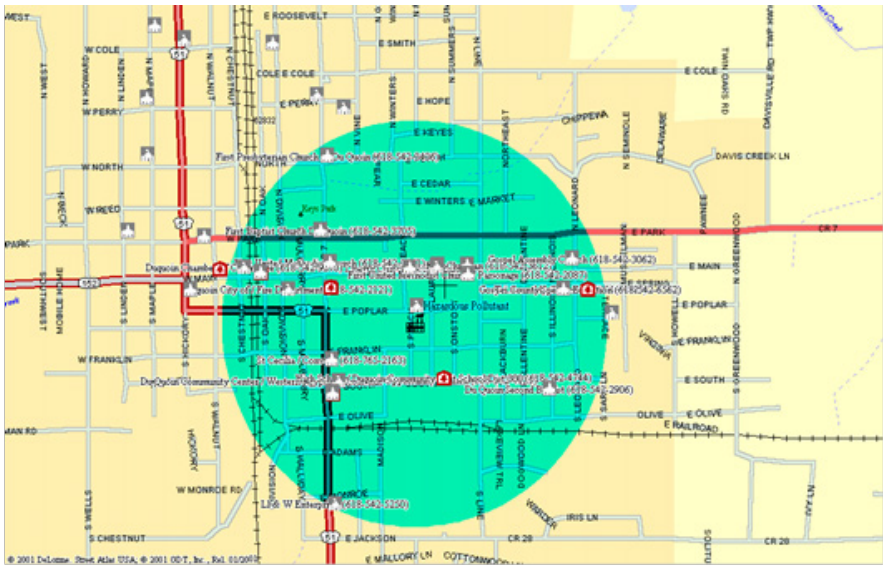
OWNER OBJECTIVE

Kraft Foods North America, Inc. (KFNA) selected CEC personnel to prepare Risk Management Plans (RMPs) for a total of 15 KFNA and Nabisco plants located across the United States.

CEC APPROACH

CEC personnel provided the engineering services necessary to complete the RMPs. CEC personnel conducted site visits at each plant. The site visits consisted of the development of the worst case and alternative hazardous release scenarios, preliminary completion of RMP*Submit, evaluation of offsite receptors, review of emergency response plans, and review of any existing RMP documentation.

Processes evaluated at the facilities included ammonia and propane transfer and storage (KFNA requested that RMPs for propane be completed to comply with the "General Duty Clause" of 40CFR68.) RMPs, as well as supporting documentation, were prepared for all facilities. CEC personnel calculated the distance to endpoint for the worst case and alternative release scenarios by using RMP*Comp. CEC personnel also prepared an electronic copy of the EPA's required RMP*Submit as specified by 40CFR68. All plans were submitted within KFNA's schedule and budget requirements.



Worst Case Release Scenario Map (example only, not actual site)

Civil & Environmental Consultants, Inc.

AIR QUALITY CONSTRUCTION PERMIT APPLICATION

OWNER/CLIENT

LaFarge North America (Formerly LaFarge West, Inc.)

LOCATION

Smithland, KY

CEC SERVICES

Air Quality Permitting Services

OWNER OBJECTIVE

Lafarge North America, the largest diversified supplier of construction materials in the U.S. and Canada, produces and sells cement, ready-mixed concrete, aggregates, asphalt, paving and construction, precast solutions and pipe products. Lafarge required expansion of their Three Rivers Aglime process.

CEC APPROACH

CEC prepared a permit application and emission calculations for the construction of new equipment associated with the expansion. The permit application allowed the facility to construct the new equipment and modified the facility's State Origin Permit for minor sources. In addition, CEC prepared a permit application for the temporary addition of a portable screen and radial stacker for the facility's Rip Rap plant.

Civil & Environmental Consultants, Inc.

NATURAL GAS NITROGEN FERTILIZER PLANT

OWNER/CLIENT

Pallas Nitrogen, LLC

LOCATION

Wellsville, OH

CEC SERVICES

Phase I and Phase II Environmental Site Assessments

Threatened and Endangered Species Survey

Benthic Aquatic Survey

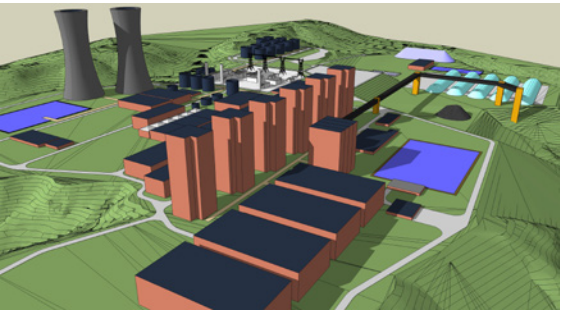
Wetland/Stream Assessment

NPDES Permitting

Geotechnical Investigation

Air Permitting

Water Permitting



OWNER OBJECTIVE

The Pallas Nitrogen (Pallas) plant will utilize natural gas as feed stock and manufacture ammonia and ammonia-derived fertilizers on a 500-acre site in Wellsville, Ohio. The project was originally permitted as a coal-to-liquid fuel plant with permitting and civil design services provided by CEC. Services previously provided by CEC for this project when coal was proposed for the feedstock included:

- The preparation of an air Permit-to-Install (PTI) application;
- An operational NPDES permit application;
- An Ohio Environmental Protection Agency (OEPA) Section 401 permit application;
- A U.S. Army Corps of Engineers (USACE) Section 404 permit application;
- A preliminary geotechnical investigation; and
- Civil/site design services.

The project was issued a PTI, an NPDES permit, a 401 permit, and a 404 permit (2007-28) in 2007/2008. A revised PTI application was prepared and additional civil/site design was performed in 2014 in response to the change to a natural gas feedstock and production of ammonia-derived fertilizers. From start to finish, the original permitting process was completed in two years. Three key factors that contributed to the rapid completion of the original permitting effort were:

- Assembling a consulting team capable of obtaining all of the necessary permit approvals;
- Developing and submitting the application in separate modules; and
- Maintaining regular and routine communications with the OEPA.

The current plan for the facility includes the production of anhydrous ammonia, urea, urea ammonium nitrate (UAN), nitric acid, and diesel exhaust fluids (DEF) using natural gas as the feedstock. The facility is to be constructed on approximately 60 acres at the 500-acre Wellsville property. Pallas hired CEC for CEC's expertise in air quality, water quality, and streams/wetland permitting, as well as the breadth of service and depth of expertise needed to prepare all the necessary permit applications.

CEC APPROACH

CEC is currently providing ecological, environmental, and civil services to revise existing permits or to re-apply for new permits. CEC is also providing civil/ site desgn support for the new site layout. As demonstrated in the original effort, CEC's integrated approach to the revised project will result in time and labor savings associated with understanding the complex and novel technology of the project, developing process descriptions and drawings that could be shared among different applications, and simplifying the project management of this multidisciplinary undertaking.

Civil & Environmental Consultants, Inc.

ENVIRONMENTAL COMPLIANCE AUDIT

OWNER/CLIENT

Hirschvogel, Inc.

LOCATION

Columbus, OH

CEC SERVICES

Air Compliance and Permitting

Auditing and Compliance Plans

Phase I & II Assessments

Site Characterization

Stormwater Sampling and Permitting

Waste Characterization

Emergency Response

Water and Soil Sampling

OWNER OBJECTIVE

Hirschvogel, Inc. is an international automotive supplier, headquartered in Germany, with its sole United States constituent facility located in Columbus, Ohio. The Columbus facility began operations in 1988 and specializes in forging and machining of steel and aluminum automotive parts for automotive manufacturers and Tier 1 suppliers.

CEC APPROACH

Hirschvogel contracted CEC to perform an environmental compliance audit in order to provide an evaluation of the facility's current compliance status in light of the departure of the Environmental Health and Safety (EH&S) Manager as well as several other employees that were assigned to assume the responsibilities of the former EH&S Manager. The facility was also seeking to purchase adjoining properties to expand its footprint and operations through use of existing buildings and construction of new buildings.

CEC personnel helped to educate the new EH&S Manager throughout the entire audit process as well as during the subsequent tasks to achieve compliance. CEC personnel took extra time to explain the various regulatory programs and requirements to help the new manager understand the importance of compliance. CEC continues to stay in contact with the EH&S Manager to ensure the facility stays in compliance as operations are expanded.

CEC assisted Hirschvogel expand their operations through the acquisition of an adjacent former industrial property, by performing a Phase I and limited Phase II Environmental Assessment (ESA). The ESAs were performed to assess potential impacts from the former industrial operations to soil, groundwater and soil vapor.

Civil & Environmental Consultants, Inc.

SITE REMEDIATION/ RELEASE CLEANUPS

OWNER/CLIENT

Confidential Gas Clients

LOCATION

Pennsylvania

CEC SERVICES

On-call Environmental Investigation

Remediation Support Services

OWNER OBJECTIVE

To help clients obtain relief from further remediation liability protection under Act 2 for releases of various regulated substances, CEC has provided site investigation, site characterization, engineering investigations, site remediation, post-remediation confirmational sampling, operation & maintenance of remediation systems, management of impacted media (recycling/disposal management), and project reporting to the PADEP.

CEC APPROACH

Many of these projects also included CEC providing support for responses to PADEP notices of violation (NOVs), Cease and Desist Orders regarding environmental releases of drilling-related materials, and other requests for information, such as USEPA and PADEP requests pertaining to material releases to the environment.

Miscellaneous projects have included:

- Sampling/analysis/evaluations of air, drinking water, surface water/ groundwater environmental impact investigations.
- Soil/sediment/groundwater/drinking water investigations and remediations.
- Monitoring well installation and sampling.
- Hydrogeologic assessments, including lineament studies and tracer studies in both fractured bedrock and overburden aquifers.
- Implementation of remedial actions:
  - Soil – source removal and in-situ bioremediation;
  - Water – pump & treat, LNAPL product removal, in-situ bioremediation.
- GPS surveying and mapping;
- Completion of PADEP Form U applications (including sampling and analysis) to allow for landfill disposal of well drilling/completion waste streams (including coordination with landfills and PADEP);
- Preparation of Human Health and Ecological Risk Assessment under Pennsylvania Act 2.

More than 60 successful site remediations have been completed encompassing releases of diesel from various sources (stationary generators, drilling equipment, tanks, etc.); drilling mud; frac fluid; brine used as part of drilling operations (frac plug perforations, etc.); and produced brine from flowback operations and storage tanks.

Civil & Environmental Consultants, Inc.

ESP EFFICIENCY EMISSIONS TESTING

OWNER/CLIENT

Westar Energy

LOCATION

St. Marys, KS

CEC SERVICES

Preparation of Sampling Plan

Conducting the emissions testing using USEPA Methods 1-17

Performing on-site gravimetric determination within 2-4 hours of sample collection

Preparation of Final Test Report

OWNER OBJECTIVE

Westar Energy, headquartered in Topeka, Kansas, owns and operates coal, natural gas nuclear, gas-to-energy and wind generating facilities in Kansas. Westar's Jeffrey Energy Center, located in St. Mary's, is a 2,155 megawatt plant commissioned in 1978 and is the largest such plant in the entire state. Westar needed to conduct total suspended particulate matter (TSP) testing for determining the control efficiency of the electrostatic precipitator (ESP) on electric generating Unit 2 at the Jeffrey Energy Center.

CEC APPROACH

CEC was contracted by Westar to conduct the total suspended particulate matter (TSP) testing. United States Environmental Protection Agency (USEPA) Methods 1, 2, 3A, 4, and 17 were used to determine the sampling point locations, flow, molecular weight, moisture, and TSP in the flue gas. Method 3A was used to determine stack gas oxygen (O2) and carbon dioxide (CO2) for determining the stack gas molecular weight determination and for calculating the pounds per million British thermal units (lbs/mmBtu).

The exhaust gases from the boiler burn chamber are exhausted through the pollution control equipment and exhausted via the stack, so the ESP efficiency testing was conducted at the east and west ESP inlet and outlet locations.

CEC provided on-site preliminary results using CEC's mobile laboratory equipped with a solvent fume hood, dessicators and gravimetric balance. CEC also prepared the sampling protocol, conducted the emissions testing, and prepared the final emissions testing report.

Westar's Jeffrey Energy Center

Civil & Environmental Consultants, Inc.

HOMER CITY GENERATION LANDFILL EXPANSION

OWNER/CLIENT

Homer City Generation, L.P.

LOCATION

Homer City, PA

CEC SERVICES

Site Selection and Characterization

Site Grading/Earthwork Analysis

Geotechnical Engineering

Stormwater Management/BMP Design

Aquatic & Terrestrial Habitat Surveys

Wetlands & Waters Delineations

Clean Water Act, Section 401/404 Permitting

Threatened & Endangered Species Surveys/Wildlife Surveys

Hydrogeologic Site Investigations

Groundwater Monitoring and Assessment

NPDES Permitting Support

CCR and Industrial Waste Management

Landfill Design and Permitting

Leachate Management and Treatment

Waste Characterization

Stormwater BMP Design and Inspections

OWNER OBJECTIVE

Homer City Generation, L.P. (HCG) owns and operates three coal-fired electric generating units and related facilities. The coal-fired electric generating units have a capacity of approximately 1,800 megawatts, of which it sells energy, capacity and ancillary services to power marketers and load-serving entities in 14 states. HCG was looking to expand its coal ash landfill, which was nearing permitted capacity, by 10 million cubic yards.

CEC APPROACH

CEC ecological, hydrogeologic and engineering professionals worked with HCG to design a landfill expansion that would minimize stream/wetland impacts and maximize the available airspace while maintaining a design what was constructible and feasible. CEC used an innovative approach to evaluate potential secondary impacts to streams/wetlands as a result of the landfill expansion including extensive surface water and infiltration modeling, locating sediment basins near streams and using infiltration galleries. CEC conducted a hydrogeologic investigation and prepared a site characterization report and groundwater monitoring system, as well as prepared a 401/404 permit application for impacts to streams and wetlands.

The Pennsylvania Department of Environmental Protection (PADEP) has approved the surface water/infiltration modeling and the hydrogeologic site characterization and has issued the 401/404 permits. The detailed engineering design is currently under review by PADEP.