



AIR ISSUES & REGULATIONS COMMITTEE
A Committee of the Bay Area Clean Water Agencies

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CARB Makes Changes to the California Greenhouse Gas Mandatory Reporting Program

By: Jacqueline Kepke/CH2M HILL, Republished from the CASA 2010 Annual Report in January 2011

CARB adopted a Mandatory Reporting Regulation for Greenhouse Gases in 2007, which took effect in January 2009. A number of wastewater agencies are currently reporting their stationary combustion-related emissions under this program and have recently completed their first cycle of 3rd party verification of their reports. Emissions from wastewater process units are not reported under this program – only those from large combustion sources. Unlike cap and trade, biomass-related emissions such as those from combustion of digester gas are not excluded. They are reported, but they are logged separately from fossil fuel related emissions.

In order to align with the Federal Mandatory Reporting Regulation adopted by USEPA last year, and to support the cap and trade program, CARB is amending its mandatory reporting program. The changes with the greatest potential impacts (good and bad) to wastewater agencies are as follows:

- CARB is lowering the reporting threshold for stationary combustion from 25,000 mton/year (mton/yr) of CO₂ to 10,000 mton/yr of carbon dioxide equivalents (CO₂e), including both biomass and fossil fuel combustion emissions.
- Those facilities with emissions between 10,000 and 25,000 mton/yr will be able to file an abbreviated report and will not be required to undergo 3rd party verification.
- Under the current regulation, agencies that operate cogeneration units that generate more than 1 MW of power and emit more than 2,500 mton/yr CO₂ have to report. Under these changes, CARB is proposing to do away with the cogen

category. Therefore, if an agency currently reports because they have a cogen facility that is >1 MW and emits >2,500 mton/yr CO₂, they will no longer have to report if their combustion emissions are less than 10,000 mton/yr CO₂e. If emissions are greater than 10,000, they will report as a stationary combustion source (see above).

- The proposed changes kick in for reporting year 2011 (filed in 2012). Current reporting requirements remain through the 2010 emissions report (filed in 2011).

Will your POTW Fall within the new CARB General Stationary Combustion Threshold for GHGs in 2011?

By: Jim Sandoval/CH2M HILL

The new 2012 California guidelines for Mandatory Reporting of GHGs eliminate the cogeneration reporting category of 1 MW of power generation and emitting more than 2,500 mton CO₂/yr and they lower the General Stationary Combustion (GSC) reporting threshold from 25,000 mton/yr of CO₂ to 10,000 mton/yr CO₂e. Those wastewater treatment plants that are currently non-GSC (i.e., < 25,000 mton/yr CO₂) should consider estimating their facility's combustion emissions for cogeneration systems, flares, boilers, etc. to confirm whether or not the facility meets the new reporting threshold. If your facility does need it, then you will need to do an abbreviated report using CARB's web-based reporting tool. If it does not, then document and file the estimation in case CARB or the BAAQMD asks for proof at a later date.

City of San Jose Fuel Cell Project

By: Bob Mouderrres/City of San Jose

The San Jose/Santa Clara Water Pollution Control Plant (Plant) relies on self generation of power to provide reliable supply of electricity to run its critical equipment. The generation systems are 30 to 53 years old and are in need of replacement. City staff has pursued an option of obtaining a turn-key biogas fuel cell co-generation system through a 20 year termed Power Purchase Agreement (PPA) using newer, renewable fuel cell technology that uses the Plant's digester gas. Under this PPA, UTS Bio Energy LLC (UTS) will design, build, own, operate and maintain a 1.4 MW fuel cell, and the Plant will purchase all power generated by the fuel cell at the agreed-upon price. The Plant's capital investment is estimated at \$1,500,000. City staff looked at other more traditional generation systems such as Internal Combustion Engine generators (ICE) and concluded that even though fuel cell has higher initial cost, it has significant environmental benefits. The planned completion date of the project is January 20, 2012. This recommendation accomplishes many of the Plant's and the City's goals:

- Reliable power generation to replace aging engine generators
- Greater regulatory certainty by elimination of air permit requirements for this system
- Environmental stewardship through lower green house gas emissions
- Advances the goal of Plant energy self sufficiency by 2022
- Comparable costs to anticipated future PG&E rates
- Additional energy source of hot water as a by-product of the system
- Reduces monthly peak demand from PG&E

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BACWA Air Committee Roundtable with Brian Bateman of BAAQMD, January 26, 2011

By: Jim Sandoval/ CH2M HILL

On January 26th the BACWA AIR Committee met with Brian Bateman, Engineering Director of the Bay Area Air Quality Management District (BAAQMD). The purpose of the meeting with Brian was to get an overview of proposed or existing BAAQMD regulations that may impact your facilities. Overall the dialogue with him was good and the greatest value was in sitting down with him for two hours and breaking the ice for continued future dialogue with the BAAQMD. The key topics discussed included

- EPA Tailoring Rule
- BAAQMD's role in implementing AB-32 Regulations
- NSPS for Sewage Sludge Incinerators
- Newly updated BAAQMD CEQA guidelines
- CARB Tier 0 Portable Diesel Engines
- State Fleet Requirements
- Proposed BAAQMD Composting Rule
- BAAQMD Reg 9/Rule 8 NO_x and CO from Stationary ICE
- New Anticipated BAAQMD Rules or Fees
- Impact of Budget Cuts on Local Permitting and Enforcement

For details on the topics discussed, AIR committee members can see the meeting summary in the BACWA AIR web page and nonmembers may request a copy from Jim Sandoval at jim.sandoval@ch2m.com.

City of San Jose Fuel Cell Project (con't from pg.1)

By: Bob Mouderrres/City of San Jose

The Plant uses an average of 7.6 MW of electricity for its daily operations, with peak loads reaching 11 MW on occasion. On average, 5.2 MW is produced on-site using engine generators fueled by a blend of natural gas purchased from PG&E, landfill gas purchased from Newby Island Landfill, and digester gas produced on-site as part of the wastewater treatment process. The remaining 2.4 MW of electricity is purchased from PG&E. Although current Plant generation capacity is 10.5 MW, generation frequently falls short of demand due to the unavailability of generators being down for maintenance and other operability factors. Even though the plant can purchase all of its electricity needs from PG&E, the ability to generate electricity in-house is critical for reliable plant operations in the event of a PG&E power failure caused by an earthquake, bird strike, or other blackout. Lack of reliable in-house electrical generation during PG&E power failures can have disastrous consequences with significant damage to critical equipment and facilities, and potential discharge of untreated sewage into the bay. The Plant needs to maintain a minimum of 8 MW of very reliable on-site generation to meet current critical power demands. This minimum power requirement is expected to increase over the next 20 years as the Plant is modernized through implementation of the Plant Master Plan. The need to replace aging engine generators is critical. Coupled with the need to replace aging generators, is the need for increased efficiency and environmental sustainability.

Fuel cells convert natural gas or biogas to electricity electrochemically like a battery. But unlike a battery which eventually goes dead as the chemicals in the battery are depleted, the fuel cell is continuously fed new chemicals so it can produce electricity for up to 5 years before the cell needs to be rebuilt. Fuel cells require very clean fuel to prevent early failure, so the biogas from the Plant must first be cleaned and conditioned through a gas cleaning system to remove most of the contaminants. The gas is then delivered to the fuel cell along with oxygen where the gas is converted to electricity, hot water and a residual gas stream of mainly CO₂. The heat from the fuel cell is recovered and used in Plant operations.

Staff has evaluated the cost benefits and applicability associated with these renewable technologies and identified fuel cell electrical generation as a cost effective technology that would yield the greatest resource and environmental benefit to the Plant. Fuel cells have one of the highest financial incentives because they use renewable biogas as fuel. They are highly efficient, and have very low air emissions compared to more traditional generation systems like an ICE or turbine generator. Fuel cells generate approximately 20% less greenhouse gases compared to an ICE, and near zero air pollutant emissions.

Although higher in initial cost, the fuel cell PPA provides the following advantages over ICE:

- Results in almost zero regulated air pollutants with simple-to-comply air permit
- Results in 20% less GHG compared to ICE, which is the equivalent of taking 192 Medium-sized cars off the road or planting 26,000 trees
- Provides new, but developed technology for the Plant to learn from with minimum risk in technology adoption
- Provides a higher efficiency generator (45% vs. ICE 37%) that uses less fuel to operate
- Provides a slightly more stable generator than an ICE (fuel cell won't fall off-line during a power outage like ICE or turbines can)
- Quieter than ICE

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EPA Proposed to Defer Permitting of Biogenic Emissions under the Tailoring Rule

By: Jacqueline Kepke/CH2M HILL, Republished from the CASA 2010 Annual Report

On March 24, 2011, EPA published in the Federal Register a Proposed Rule on Deferral for CO₂ Emissions from Bioenergy and Other Biogenic Sources under the Prevention of Significant Deterioration (PSD) and Title V Programs. Under the Tailoring Rule, a rule adopted by EPA last year, sources with greenhouse gas (GHG) emissions exceeding certain thresholds are subject to PSD and Title V permitting under the Clean Air Act. Because the Tailoring Rule did not differentiate between anthropogenic emissions (e.g. GHGs from fossil fuel combustion) and biogenic emissions (e.g. GHGs from combustion of biomass fuels such as landfill or digester gas), the Tailoring Rule had the potential to bring California wastewater facilities into the Clean Air Act permitting programs that hadn't been previously.

Consistent with announcements made by EPA Administrator Jackson in January, EPA issued this new rulemaking to defer these permitting requirements for biogenic sources of CO₂ including wastewater treatment plants. This is a very positive development for the wastewater community and is consistent with comments that CASA and the California Wastewater Climate Change Group (CWCCG) submitted in response to the original Tailoring Rule as well as to a Call for Information issued by EPA, and to guidance issued by EPA last year on Tailoring Rule implementation. If this deferral rule is adopted as proposed, it is expected that no new wastewater plants will be pulled into PSD or Title V, at least for the next three years. Facilities already operating under Title V permits may need to address GHGs in the next permit renewal cycle, but no substantive changes to those permits are expected. Over the next three years, EPA will be engaging with stakeholders on how to handle biogenic emissions long term. CWCCG will continue to engage in these discussions.

The proposed rule is available at <http://www.gpo.gov/fdsys/pkg/FR-2011-03-21/html/2011-6438.htm>. CASA provided input to oral comments made by the National Association of Clean Water Agencies (NACWA) at the April 5 hearing in Washington, D.C., and will be submitting written comments on the proposed rule by the May 5, 2011 deadline. It should be noted that the Tailoring Rule overall is extremely controversial, and lawsuits have been filed by both environmental and industry advocates. In addition, several bills are making their way through Congress that would prevent EPA from implementing the rule. CASA and CWCCG will continue to track these developments.

BCDC Bay Plan Amendment on Climate Change

By: Jacqueline Kepke/CH2M HILL & Jim Sandoval/CH2M HILL

The Bay Conservation and Development Commission (BCDC) proposed amendments to the Bay Plan to address adaptation to climate change. In particular, the amendments restrict development in inundation zones resulting from sea level rise. Bay Area WWTPs would be within the inundation zone, so new projects would need to be justified in accordance with the Plan. The Bay Planning Coalition, Bay Area Council, and Building Industry Association have raised strong opposition to the amendments as they are very prescriptive and limit local government control over land use decisions. Changes to the amendment language have been proposed by a team of land use lawyers representing local government agencies.

Public meetings were held in the nine Bay Area counties in 2010. The process and consequently follow-on meetings have been delayed. BCDC is planning to develop a new revised recommendation for publication in May 2011. They plan to hold a new round of public meetings during the 30-day comment period of the revision between late April and early June. On behalf of BACWA AIR, CH2M HILL will continue to watch the Commission's website and meeting notices for updates on the amendments and the meetings.

For more information, visit http://www.bcdc.ca.gov/proposed_bay_plan/bp_amend_1-08.shtml.

Sea Level Rise in California, Oregon, and Washington

By: Tim Smith, Sustainable Water Resources Coordinator and Geurt van de Kerk, Sustainable Society Foundation geurt.vandekerker@ssfindex.com

A new project announced by the National Academy of Sciences will address sea level rise on the West Coast of the U.S. This project relates to the general problem of global change, which has important implications for water resources that go far beyond sea level changes. Thinking about the project description given below, it is not hard to see impacts on precipitation, surface and ground water at least for this region, and potentially for the entire world. With the present high level of interest in this subject, most federal agencies that have related missions include global change in their appropriation requests, in some form.

A committee will provide an evaluation of sea level rise for California, Oregon, and Washington for the years 2030, 2050 and 2100. The evaluation will cover both global and local sea level rise. In particular, the committee will evaluate each of the major contributors to global sea level rise (e.g., ocean thermal expansion, melting of glaciers and ice sheets) and combine the contributions to provide values or a range of values of global sea level rise. The committee will also characterize and, where possible, provide specific values for the regional and local contributions to sea level rise (e.g., atmospheric changes influencing ocean winds, ENSO [El Niño-Southern Oscillation] effects on ocean surface height, coastal upwelling and currents, storminess, coastal land motion caused by tectonics, sediment loading, or aquifer withdrawal). Different types of coastal settings will be examined, taking into account factors such as landform (e.g., estuaries, wetlands, beaches, lagoons, cliffs), geologic substrate (e.g., unconsolidated sediments, bedrock), and rates of geologic deformation. For inputs that can be quantified, the study will also provide related uncertainties.

For more information, visit the following websites:

Project Information, <http://www8.nationalacademies.org/cp/projectview.aspx?key=49290>

Government Web Site, <http://acwi.gov/swrr/>,

Archive Web Site, <http://sites.google.com/site/sustainablewaterresources/>.

California Cap and Trade Program Faces Advances and Setbacks

By: Jacqueline Kepke/CH2M HILL, Republished from the CASA 2010 Annual Report

The California Air Resources Board (CARB) adopted the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, otherwise known as “cap and trade” at its December 16, 2010 meeting. Cap and trade is a market-based regulatory framework in which regulated entities can trade “allowances” for their CO₂ emissions. Adoption of this regulation is part of the state’s implementation of AB 32 - The Global Warming Solutions Act of 2006. The cap and trade program is scheduled to begin implementation in 2012.

While there is no specific exemption for wastewater agencies, CASA and its California Wastewater Climate Change Group (CWCCG) partners successfully worked with CARB staff to ensure that no wastewater agencies in California trigger into the cap. Wastewater agencies will not have a compliance obligation because emissions from combustion of biomass do not count toward the emissions threshold. This means that emissions associated with burning landfill or digester gas are excluded, and there are currently no wastewater agencies in California that emit more than the 25,000 metric tons/year threshold based on fossil fuel combustion alone.

CARB is continuing to move forward toward 2012 implementation. They plan to hold a series of workshops on various topics, including carbon offsets. A schedule of workshops and other regulatory activities occurring throughout 2011 is listed below and more details can be found at <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>. CARB staff plan to present an update on activities along with proposed amendments to the regulation at the July Board meeting.

At the same time as staff is moving forward, however, a California court has ordered CARB to revise its environmental review of cap and trade. In a decision issued March 18, 2011, Superior Court Judge Ernest Goldsmith ruled that CARB hadn’t conducted an adequate environmental review before it approved the Scoping Plan, which established its intent to adopt a cap and trade program. The decision came in *Association of Irrigated Residents v. California Air Resources Board*, a lawsuit brought by Communities For A Better Environment, California Communities Against Toxics, Society For Positive Action and other groups, who claimed that CARB did not adequately explain why it chose a cap and trade program over a carbon tax or straight “command and control” regulation of greenhouse gases.

The ruling essentially puts on hold any implementation of the Scoping Plan until CARB has satisfied the requirements of CEQA and CARB’s certified environmental review program. Absent any stay of the decision, action to finalize the cap and trade program will be deferred until after the revised environmental document for the Scoping Plan is certified. It is likely that CARB also will have to defer other rulemaking actions implementing the Scoping Plan, including revisions to the low-carbon fuel standard and consideration of other offset protocols for the cap and trade program.

CARB’s Cap-and-Trade Program Activities for 2011

The following schedule provides an overview of the workshops and activities CARB is proposing to complete in order to take Cap and Trade forward into implementation.

Spring:

- Offset protocols workshop
- Compliance workshop planned topics: compliance cycle, penalties
- Electricity workshop planned topics: reporting requirements for electricity deliverers, voluntary renewable energy, and long-term electricity contracts
- Allocation workshop
- Program management workshop planned topics: holding and purchase limits, corporate association reporting requirements, auction design, market oversight, and penalties

Late Spring:

- First regulation change notice package (“15-day changes”) released for public comment

Early Summer:

- WCI Linkage workshop

Mid-Summer:

- Second regulation change notice package (“15-day changes”) released for public comment

Fall:

- Cap-and-trade regulation finalized
- Compliance workshop planned topics: registration process, compliance cycle, tracking system training

December:

- Cap-and-trade regulation goes into effect

California Energy Policy Opportunities for POTWs

By: Jacqueline Kepke/CH2M HILL, Adapted from CASA 2010 Annual Report and CASA January 2011 Newsletter

Many BACWA members are aggressively developing renewable energy projects to be part of the climate change solution – from expanding digester gas production by adding FOG or food waste, to developing biosolids-to-energy facilities, to installing solar panels and wind energy generation. In order to support these efforts, CWCCG is working to influence California's energy policies to maximize revenue opportunities and incentives for renewable energy generated by POTWs, including the following:

Renewables Portfolio Standard (RPS) Eligibility

The Renewables Portfolio Standard is an existing regulatory program that requires investor-owned power utilities to meet renewable energy targets. The California Energy Commission (CEC), through their *Overall Program Guidebook* and *Renewables Portfolio Standard Eligibility Guidebook*, determines what types of renewable energy count toward the targets. Under these guidebooks, biosolids, digester gas, and landfill gas are all considered eligible renewable energy resources.

Renewable Electricity Standard

In Executive Order S-21-09, Governor Schwarzenegger directed CARB to adopt a regulation requiring the state's energy utilities to meet a 33 percent renewable energy target by 2020. This builds on the existing 20 percent renewable requirement in the RPS. In the Renewable Electricity Standard (RES) regulation, CARB maintained the same eligible resources or fuels currently allowed under the existing Renewable Portfolio Standard (RPS). As described above, this is a good thing for the wastewater community, as eligible resources currently include biosolids, digester gas, and landfill gas. The regulation was adopted in September 2010. Wastewater agencies are not directly subject to this regulation, which targets energy utilities, but they are eligible to sell renewable energy credits (RECs) under the program for renewable energy generated at their facilities.

California Public Utilities Commission Decisions on Tradable RECs

The California Public Utilities Commission (CPUC) administers the RPS, and in that capacity, they determine how RECs can be generated and traded for RPS compliance. Currently, RECs are coupled with the electricity itself and must be sold to a load serving entity (essentially an energy utility) along with the energy. In a series of recent decisions, CPUC has proposed to allow tradable RECs. If RECs were tradable, wastewater agencies may be able to sell RECs for energy generated and used onsite that is not sold to the grid. Additionally, RECs could be sold to third parties in addition to energy utilities. REC trading is a very controversial topic, as it influences how out-of-state renewable energy can be used to satisfy California requirements. CWCCG has become a party to these decisions and will continue to advocate for a tradable REC market as a way to incentivize development of renewable energy at water and wastewater agencies.

Economic Incentives for Biogas Production and Use

CWCCG encouraged CPUC to consider a funding program or other framework for economically incentivizing biogas production and use. The success of the California Solar Initiative provides a model for expanding uptake of distributed renewable energy technology. These types of incentives nudge projects toward an economic tipping point, making them economically feasible while technology continues to improve and costs naturally go down. Many wastewater agencies, particularly in the South Coast Air Basin, are under increasing pressure to cease use of the internal combustion engines they have relied on for years to produce onsite renewable power using biogas. These agencies are looking for alternatives, including putting the biomethane into natural gas pipelines; however the cost of biogas conditioning equipment can tip the economic balance away from these projects. SoCalGas is seeking permission from the CPUC to construct, operate, and own biogas conditioning facilities, and the Southern California Association of POTWs (SCAP) and CWCCG are both supporting this concept. Discussions on biogas are also ongoing in Northern California with PG&E.

Feed-In-Tariffs

The current rates at which third-party power generators can sell renewable power to the grid are not high enough to incentivize projects such as co-digestion for increased energy production. On October 21, 2010, the Federal Energy Regulatory Commission (FERC) issued an order that enables the CPUC to establish multi-tiered tariffs, allowing the state to take into account the cost of different energy producing technologies. The order further states that the new rates need to be commensurate with the avoided costs that utilities receive for comparable energy developed under the state's Renewable Portfolio Standard (i.e., up to \$0.16 to \$0.20 per kilowatt-hour (kWh) instead of the current \$0.08 per kWh). This ruling has the potential to greatly enhance the economic benefits that owners of small-scale renewable energy and combined-heat and power (CHP) facilities such as wastewater treatment agencies receive under California's Feed-In Tariff (FIT) programs, thereby incentivizing new project development. CPUC is about to undertake proceedings to update FIT programs. CWCCG is participating in these proceedings on behalf of BACWA members and is advocating that CPUC establish an appropriate interim FIT consistent with FERC's order.

Anaerobic Digestion of Fats, Oil, and Grease (FOG)

By: Manisha Berde/ San Francisco Public Utilities Commission's Wastewater Enterprise

Fats, Oil, and Grease (FOG) used in restaurants and food service establishments can cause problems in the sewer system and can be the reason for clogging of the sewer lines. FOG going down the drain can be diverted from the sewer system by using grease traps to collect it and the trap waste can be used to produce renewable energy. Many utilities in United States have piloted as well as implemented on a full-scale basis anaerobic digestion of brown grease with primary and activated sludge and have demonstrated higher methane gas production compared to municipal sludge alone.

The anaerobic digestion of FOG has many benefits such as production of methane gas that can be used to run the treatment plant and offset operational costs, and reduce maintenance cost associated with sewer blockages.

The San Francisco Public Utilities Commission's Wastewater Enterprise (SFPUC – WWE) has conducted a pilot study at the Southeast Plant (SEP) on anaerobic digestion of FOG (brown grease) with primary and activated sludge to assess biogas production. The study also involved assessing the performance and toxicity effects on anaerobic digesters when introduced with byproducts of biodiesel production such as biobunker, methanol, and glycerin.

The pilot study involved simulation of anaerobic digesters on a smaller scale. Two 30 gallon digesters were used for the study – one as control and the other for testing. These digesters were equipped with heating systems to maintain the sludge temperature at mesophilic range (35 °C) and a recirculation system to keep the solids in suspension and to maintain the desired temperature. The test digester sequentially received brown grease, glycerin, methanol, and biobunker mixed with combined primary and activated sludge, whereas the control digester received only combined primary and activated sludge. The testing of brown grease and byproducts (glycerin, methanol, and biobunker) were done separately. The digesters were tested for their performance by monitoring volatile solids reduction, total solids reduction, alkalinity, volatile fatty acids, pH, ammonia, and COD removal. The gas formed in both digesters was measured using gas meters.

The results obtained from this study are quite encouraging. An increase in gas production was observed from anaerobic digestion of brown grease and no major negative effects were observed on digester performance when introduced with biobunker, glycerin, or methanol.

From the Frying Pan to Fuel: SFPUC's Renewable Energy Program (II)

By: Karri Ving and Nohemy Revilla/San Francisco Public Utilities Commission

In BACWA's Winter 2010, Newsletter, the SFPUC reported on the components, challenges and successes of one of its most highly visible Renewable Energy programs: "SFGreasecycle". This article provides a status update and additional information about the program.

In November of 2007, the SFPUC launched "SFGreasecycle" as a free used fryer oil collection service to all San Francisco restaurants. The purpose of the program was to discourage businesses from pouring waste oil down the drain while also diverting this material towards renewable fuel (biodiesel) and renewable energy (methane). What initially started out as one City crew collecting from 30 restaurants has grown into four crews collecting from more than 1,000 restaurants donating over 300,000 gallons of oil per year. Crews hand collecting used oil and grease offer best management practices and information on grease capturing equipment and pollution prevention. Additionally, the SFGreasecycle program began educating residents on the impacts of pouring even small amounts of grease down the drain. The program now offers household drop-off locations across San Francisco, encouraging residents to donate their oil towards generating sustainable biofuels. About 10,000 pounds of used grease are dropped off each year from San Francisco residents.

The program has generated more than a half million dollars in annual revenue from waste cooking oil sales to biodiesel manufacturers (more than a quarter million dollars were generated in fiscal year 2009/2010). The cooking oil polishing plant, currently under construction, will remove wash water and food particles from collected oil, sending these contaminants to treatment plant digesters for increased methane generation while improving oil quality as a biodiesel feedstock. This plant is expected to be completed on late May, 2011. This plant will allow for a more suitable biodiesel feedstock to be sold at a higher price per gallon (as much as \$3.00/gallon).

To complement the SFGreasecycle program in tackling all forms of waste grease, the SFPUC's Pollution Prevention Program drafted and helped pass the 2011 FOG Control Ordinance requiring all grease generating restaurants to install and maintain grease capturing equipment. Further, the SFPUC will soon offer a 14.2% sewer rate reduction to all restaurants that install and maintain the latest grease removal technology, automatic grease removal devices.

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EPA's Energy Star Leaders Drive Greater Energy Efficiency

By: Stacy Kika, USEPA; Kika.stacy@epa.gov; 202-564-0906; 202-564-4355

Thousands of buildings across the country are saving energy while reducing harmful air pollutants and protecting the health of Americans with the U.S. Environmental Protection Agency's (EPA) Energy Star program. EPA recognized 74 leading Energy Star organizations for their achievements in energy efficiency across their entire building portfolios in 2010, 50 of which were recognized as first time Energy Star Leaders. Through their commitment to superior energy management, these organizations together have prevented the equivalent of more than 460,000 metric tons of carbon dioxide emissions annually and saved more than \$100 million a year.

To be an Energy Star Leader, an organization must meet one of two energy efficiency improvement milestones. The first milestone requires a 10 percent improvement in energy performance across the entire building portfolio, and subsequent recognition is given for each 10 percent improvement thereafter. The second milestone, known as "top performer," requires the buildings in an organization's portfolio, on average, to perform in the top 25 percent of similar buildings nationwide.

Two organizations have taken Energy Star Leaders to new heights, becoming the first to improve energy efficiency across their building portfolios by 40 and 50 percent. These organizations are Blue Mountain School District in Pennsylvania and DeKalb County Central Unified School District in Indiana, respectively.

The complete list of Energy Star Leaders includes more than 150 school districts, commercial real estate companies, healthcare systems, supermarket operators, hotel managers, and government organizations. These organizations represent more than 6,790 buildings covering nearly 540 million square feet across 36 states and the District of Columbia.

For a list of Energy Star Leaders (as of December 31, 2010) and more information on how your wastewater treatment plant may become an Energy Star Leader, visit:

http://www.energystar.gov/2010_Leaders_list.pdf

<http://www.energystar.gov/leaders>

EPA Provides Information on Innovative and Emerging Energy Conservation Measures to Help Wastewater Utilities Reduce Energy Consumption

By: SCAP Energy Management Committee: Chair Andre Schmidt and Vice Chair Chris Berch

As part of U.S. Environmental Protection Agency's (EPA) commitment to expanding cost saving, energy conservation, and efficiency programs, it has released a new technical document to assist municipal utility owners and operators in finding information on cost-effective energy management and energy conservation measures and technologies to reduce total energy usage at their wastewater treatment facilities. The document, "Evaluation of Energy Conservation Measures for Wastewater Treatment Facilities," presents technical and cost information about energy management and energy conservation measures and technologies.

Technical and cost data were developed from literature sources and provided by manufacturers and operating facilities. The document provides preliminary information on innovative and emerging energy conservation measures and technologies that have the potential for substantial energy savings. In addition, the document includes nine in-depth facility studies that further examine application and cost information for various full-scale, operational energy conservation measures and technologies.

For more information and to view a copy of the document, go to: <http://water.epa.gov/scitech/wastetech/publications.cfm>.

What's new in WERF's Optimization Research

By: Divya Bhargava/CH2M HILL

Water Environment Research Foundation (WERF) recently released several new reports on energy efficiency and recovery. Highlights from the recent research are as follows:

- *Energy Efficiency in the Water Industry: A Compendium of Best Practices and Case Studies - Global Report* (OWSO9C09). This report provides 150 case studies – both national and international – to help utilities better manage energy efficiency and recovery in water and wastewater systems. This report supplements WERF report *Energy Efficiency in Wastewater Treatment in North America* (OWSO4R07e), which offers North American best practices for energy-efficient operation of wastewater assets as part the Global Water Research Coalition's compendium project.
- *Evaluation of Combined Heat and Power (CHP) Technologies for Wastewater Treatment Facilities* (EPA-832-R-10-006). WERF researchers from Brown and Caldwell investigated several technologies for producing heat and power from biogas – internal combustion engines, gas turbines, micro turbines, and fuel cells – to provide detailed process descriptions, performance data and cost information. Their findings were prepared under an assistance agreement awarded by U.S. Environmental Agency and WERF for the ongoing project *Methane Evolution from Wastewater Treatment and Conveyance* (U2R08). For more information, please visit: <http://water.epa.gov/scitech/wastetech/publications.cfm>.

BAAQMD Reg. 9, Rule 8: Stationary Internal Combustion Engine Limits in 2012

By: Sarah Merrill/ CH2M HILL

Starting January 1, 2012, smaller stationary combustion engines, with an output of 50 brake horsepower (bhp) or greater, will start being regulated. In addition, no specific fuel type will be exempted. Previous to 2012, engines fired exclusively by liquid fuels are exempt. Emergency standby engines will remain exempt. Below are the changes to the regulation coming into effect:

Spark-Ignited, Fossil Fuel*

	Effective January 1, 2012
Rich Burn Engines, NO _x	25 ppmv
Lean Burn Engines, NO _x	65 ppmv
CO	2000 ppmv (remains unchanged)

Compression-Ignited, Effective January 12, 2012*

	NO _x (ppmvd)	CO (ppmvd)
51 - 175 bhp	180	440
Greater than 175 bhp	110	310

*All emissions levels as corrected to 15% oxygen, dry basis

Spark-Ignited, Waste-Derived Fuels or Combination of Fuels*

	Effective January 1, 2012
Rich Burn Engines, NO _x	70 ppmv
Lean Burn Engines, NO _x	70 ppmv
CO	2000 ppmv (remains unchanged)

Low Use Limited Exemption

	Effective January 1, 2012
Engines ≤ 1000 bhp	All engines that operate less than 100 hours in a 12-month period
Engines > 1000 bhp	All engines that operate less than 100 hours in a 12-month period

Emergency Standby Engines for Essential Public Services

- May operate for emergency use for an unlimited number of hours
- Effective January 1, 2012, reliability-related activities may not exceed 100 hours per calendar year or limitations contained in permit, whichever is lower.

Delayed Compliance until 2016, is an option for some qualifying engines if they are reported. See the following website for further details: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Regulations/Regulations/Reg%2009/rg0908.ashx> .

BAAQMD Regulation 9, Rule 7: Compliance Extensions: NO_x and CO from Boilers, Steam Generators & Process Heaters

By: Sarah Merrill/CH2M HILL

Regulation 9, Rule 7 currently requires manufacturers to pre-certify new, natural-gas fired devices rated between 2 – 10 million BTU per hour (MM BTU/hr) for sale in the Bay Area. However, by January 2011, no manufacturer had certified to the standards and therefore no manufacturer-certified devices were available locally. Businesses were not able to comply with this rule and BAAQMD has proposed extensions for the relevant rule deadlines.

Proposed deadlines are the following:

1. NO_x and CO emission limits compliance date for new & existing devices rated > 2 – 5 MM BTU/hr: January 1, 2013 (extended 2 years)
2. NO_x and CO emission limits compliance date for new & existing devices rated > 5 - 10 MM BTU/hr: January 1, 2013 (extended 1 year)
3. Stack temperature limits compliance date for new & existing devices: January 1, 2013 (extended 2 years)
4. Certification deadline for all new devices sold or installed: January 1, 2012

These proposed changes are slated to be reviewed and accepted by BAAQMD in May 2011.

For more information on the proposed changes or on the rule itself, please visit the following websites:

<http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Advisories/Combustion%20Equipment/Boiler%20Adv%20for%20Manufacturer.ashx>.

<http://www.baaqmd.gov/Divisions/Planning-and-Research/Rule-Development/Rule-Workshops.aspx>.

Waukesha Engine Emissions Control Schema

By: Ken Kaufman/ South Bayside System Authority

South Bayside System Authority (SBSA) is currently using the Waukesha VHP 1200 hp 12 cylinder engine designed to burn digester gas in a lean burn state. SBSA has found that NO and NO₂ emissions can be reduced by keeping the cylinder temperatures below 1100 °F. If temperatures rise above 1100 °F, then nitrogen combines easily with oxygen and produces more NO_x.

Fuel control is an up-draft normally aspirated, non-turbo charged, carburetor. This engine is used to drive a 650KW 3-phase 480V generator. The emission controls uses an Allen-Bradley SLC 500 programmable logic controller (PLC), two air driven valves, throttle position sensor (TPS), 12 air injectors, and a device to monitor the percent oxygen in the engine exhaust. To control the cylinder temperatures air injectors have been installed onto the intake manifold which allows cool air to enter directly into each cylinder without going through the carburetor. The air injector tube outlets are about an inch away from the intake valves. There are two banks of air injectors, six on the left and six on the right. Each bank manifold (not the intake manifold) has an air valve attached to the end of the manifold to control the amount of air going through the air injectors and into the cylinders. No air pump is required for this. The vacuum of the engine sucks the air through the air valves, through the injectors and into the cylinders.

What SBSA has observed:

- Engine running
- Hand operated shutoff valves to the air injectors are closed – emission's controller OFF
- Engine with a 100KW load
- ECOM-PLUS 5 gas analyzer hooked up to the engine

During this time the carburetors were adjusted so the engine exhaust has about 4% excess oxygen, a lean burn requirement. The temperature is about 1050 ° F on average and NO_x about 190 ppm. The role of the carburetor is to maintain the correct air and fuel mixture ratio. The percent oxygen should remain the same (4%) through the range of the carburetor performance, however, it does not. As load on the generator is increased, the throttle increases and more air and fuel are allowed to pass through the carburetor, thus creating more energy and heat. Cylinder temperatures go up and cause the oxygen to combine with nitrogen. SBSA found that you can never stop this process, only reduce its effects. When keeping the cylinder temperature down below 1100° F the production of NO_x drops off quickly for this engine.

So by just allowing a little cool air directly into the cylinders, lower cylinder temperatures can be maintained thus reducing NO_x emissions. But if you allow too much air into the engine, the engine will start to run rough. Too much air short circuits the carburetor, allowing it to be "bypassed" and throwing the air/fuel mixture off.

Emission Control Schema

There are several ways to control the air going into the air injectors. One way would be to monitor each cylinder temperature and allow a PLC to modulate an air valve for each injector. This sounds good but would be too costly and a nightmare to maintain. SBSA found out if the engine's percent oxygen level could be monitored there would be a way to control the air valves, allowing just the right amount of air to maintain lower cylinder temperatures. Knowing that there is excess oxygen indicates complete burn but knowing how much excess oxygen can indicate how much cool air is being injected into the cylinders. With that information, you can control the production of NO_x and still get good performance from the engine.

There are two engine condition signals that are sent to the emission PLC, TPS and percent oxygen. One output leaves the emission PLC to control the two air valves for the injectors. Other outputs are collected and sent to A Supervisory Control and Data Acquisition (SCADA) system. The first input is the TPS and is attached to the throttle body actuator to monitor the amount of throttle being applied to the engine. The second input going to the PLC is the exhaust gas percent oxygen signal. TPS and percent oxygen signals are wired to the PLC analog input card. The PLC program divides the TPS signal into 12 steps and each step has a starting and ending TPS value. As the throttle advances the TPS values increase and the PLC looks at that value and finds what step the throttle is in. Within that step the PLC knows what the percent oxygen levels should be at that throttle position. The percent oxygen level for each step is preprogrammed by the mechanic while emission calibration is being performed, to be discussed later. The PLC compares the required percent oxygen level with actual exhaust gas percent oxygen and subtracts the two values. If the resultant value is zero then the PLC will take no action. If the value is positive, then too much air is being injected into the engine and the PLC will start to reduce the air valves. If the resultant value is negative then more injector air is needed.

[See Page 14 for continued article]

Assessing Ozone Reactivity Emissions from a Biofilter at a Compost Facility Using the SCAQMD Modified USEPA Flux Chamber Technology and the UC Davis Mobile Ozone Chamber Assay Technology

Summary of white paper by Peter Green, Ph.D., Isabel Faria, Ph.D., Mike Kleenman, Ph.D., Zackary Kay, Randy French, Tom Card, and CE Schmidt, Ph.D.

Researchers recently conducted a site assessment at the City of Santa Rosa biosolids compost facility to evaluate the air emissions from the facility's biofilter using both the traditional regulatory-approved flux chamber assessment technology, and also with the UC Davis Mobile Ozone Chamber Assay (MOChA) for assessing ozone formation potential (OFP). The test objectives were to:

- Assess the air emissions of total non-methane non-ethane organic compounds (TNMNEOC) from a biofilter at a compost site for the purpose of providing engineering evaluation data regarding biofilter media performance
- Conduct the engineering evaluation using regulatory approved methods that satisfy South Coast Air Quality Management District (SCAQMD) Rule 1133 requirement for the area source assessment on area sources found at compost sites
- Report the TNMNEOC air emissions and ozone formation potential from biofilter establishing a link between conventional ozone precursors and ozone formation potential (OFP)
- Begin to generate a data base where hydrocarbon emission factors for area sources are also described by OFP



By matching short-term OFP in the field (assessed with a mobile ozone chamber) to a photo-chemically reactive hydrocarbon compound assessment, the significance of area source emissions relative to regional air pollution concerns can be better understood.

In summary, the assessment yielded the following conclusions:

- SCAQMD modified USEPA/Method 25.3 TNMNEOC hybrid approach offers hydrocarbon and ozone formation potential assessment
- Volatile organic compound (VOC) speciation with incremental reactivity analysis supports the OFP assay
- 'Hybrid' assessments can provide a link between traditional VOC assessment and ozone formation potential as an assessment approach
- Continued research is needed to establish ozone formation potential assessment technologies and promote changes to future clean air inventories and emissions controls

The study was conducted by Peter Green, Ph.D., Isabel Faria, Ph.D., and Mike Kleenman, Ph.D., of U.C. Davis, Zackary Kay and Randy French of the City of Santa Rosa, Tom Card, M.S., of Environmental Management Consulting, and environmental consultant CE Schmidt, Ph.D. A white paper for this study may be downloaded by BACWA AIR Committee members at <http://bacwa.org/Committees/AirIssuesRegulations.aspx>. Non-committee members may obtain a copy from Zackary Kay at ZKay@ci.santa-rosa.ca.us.

Updated BAAQMD CEQA Guidelines

Source: <http://www.baaqmd.gov>

At the December 15, 2010 Board Meeting, the District's Board of Directors revised the effective date for the risk and hazards thresholds for new receptors from January 1, 2011 to May 1, 2011. These additional months will provide more time for lead agencies and others to become fully prepared to implement the risk and hazards thresholds. Staff will continue to expand and refine the screening tables and technical support tools to assist implementation of the CEQA Guidelines. All other CEQA thresholds of significance adopted by the Board of Directors on June 2, 2010 remain effective as of June 2, 2010.

For more information, visit:

<http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx>

Final Compliance Deadlines for the Fleet Rule for Public Agencies and Utilities

Adapted from ARB Notification

The final compliance deadline for most of the remaining diesel vehicles subject to the California Air Resources Board (CARB) Fleet Rule for Public Agencies and Utilities is December 31, 2011. All cities, counties, special districts, State of California public agencies and privately-owned utilities that provide services for water, natural gas and electricity that operate diesel vehicles greater than 14,000 pounds gross vehicle weight rating (GVWR) are subject to the Fleet Rule for Public Agencies and Utilities.

The regulation requires fleets to apply best available control technology (BACT) to a percentage of the fleet based on an implementation schedule. To meet BACT requirements vehicles must be retrofitted with the highest level particulate matter (PM) exhaust filter, be repowered with an engine that is originally equipped with a PM filter, be designated low use or the vehicle must be retired.

All Group 3 vehicles (2003-2006 model year engines) must have met BACT by December 31, 2010, all 2002 and older model year engines must meet BACT by December 31, 2011 and any 2007 model year or newer engine certified above 0.01 g/bhp-hr for PM must meet BACT by December 31, 2012.

For more information about the regulation, go to: www.arb.ca.gov/msprog/publicfleets/publicfleets.htm

CARB In-Use, Off-Road Diesel Regulation: Deadlines Extended

By: Sarah Merrill/CH2M HILL

The CARB In-Use, Off-Road Diesel Regulation went through a series of reviews and proposed changes in 2010. In December 2010, the following changes were accepted:

- Four year extension for all fleets:
 - January 1, 2014, for large fleets (over 5,000 hp)
 - January 1, 2017, for medium fleets (2,501-5,000 hp)
 - January 1, 2019, for small fleets (2,500 hp or less)
- Reduction & simplification in the annual requirements for fleets and fleet average structure. Fleets now have only one fleet average target to meet based on their NO_x emissions; if they cannot meet the fleet average target, they are required to reduce their total fleet horsepower by 5-10% (reduced from 28 -30%)
- Exhaust retrofits no longer mandatory
- Increase of low use threshold to 200 hours per year (previously 100 hours)

Overall, CARB staff estimates that these amendments reduce the compliance costs by more than 95% during the first five years and more than 70% during the entire span of the regulation.

Note that other requirements from this regulation are still in effect and unchanged by these amendments such as reporting, labeling, and idling time limits. However, large fleets are currently exempt from reporting and compliance certification for 2011. Please be aware that these are enforceable and non-compliance could result in fines.

For more information:

http://www.arb.ca.gov/msprog/ordiesel/documents/post_2010_hearing_fact_sheet.pdf

<http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>

California Emissions Estimator Model™

By: Jacqueline Kepke and Jim Sandoval/CH2M HILL

SCAQMD has recently released a new tool-- *California Emissions Estimator Model™* (CalEEMod). It is a statewide emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model quantifies direct emissions from construction and operation (including vehicle use), as well as indirect emissions, such as GHG emissions from energy production, solid waste handling, vegetation planting and/or removal, and water conveyance. The model incorporates Pavley standards and Low Carbon Fuel standards into the mobile source emission factors. Further, the model identifies mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from measures chosen by the user. The GHG mitigation measures were recently developed and adopted by the California Air Pollution Control Officers Association (CAPCOA).

The model was developed in collaboration with the air districts of California, so we can expect its use to spread statewide. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is free of charge and will be periodically updated when modifications are warranted.

The model is an accurate and comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model can be used for a variety of situations where an air quality analysis is necessary or desirable such as California Environmental Quality Act (CEQA) documents, National Environmental Protection Act (NEPA) documents, pre-project planning, compliance with local air quality rules and regulations, etc.

Details on the wastewater treatment plant component can be found in Appendix A of the User's Guide, specifically pages 32-37. For additional information, go to <http://www.caleemod.com/>

Urban Greening Grant Program

http://sgc.ca.gov/urban_greening_grants.html.

On behalf of the Strategic Growth Council (SGC), the California Natural Resources Agency will be administering the second of three rounds of a competitive grant program for urban greening and plans and projects. Guidelines for plans are available at http://resources.ca.gov/bond/2011_Urban_Greening_Planning_Guidelines_Round_2.Final.pdf, and guidelines for projects at http://resources.ca.gov/bond/February_2011_Urban_Greening_Project_Guidelines_Round_2.Final.pdf.

Grants will fund plans and projects that reduce greenhouse gas emissions and provide multiple benefits including, but not limited to, decreasing air and water pollution, reducing the consumption of natural resources and energy, increasing the reliability of local water supplies, or increasing adaptability to climate change.

Regional grant workshops took place in March. The solicitation for Urban Greening Plan grant applications will be issued the beginning of April with an approximate 45 day submittal timeframe. Awards are anticipated to be announced late 2011 and are contingent upon inclusion in and enactment of the State budget and available cash.

All entities applying for Urban Greening Project grants will be required to submit a concept proposal form in order to receive an invitation to submit a full application. This form is currently available on-line. The solicitation for applications for the project Grant Program is expected to be issued the beginning of April with an approximate 45 day submittal timeframe. Awards are anticipated to be announced early 2012 and are contingent upon inclusion in and enactment of the State budget and available cash.

City of San Jose Fuel Cell Project (cont. from pg. 2)

- Provides greater regulatory certainty (the ICE estimate contains some costs for future, more stringent air regulation changes, but may not cover all the costs which are hard to predict. The fuel cell is not expected to require any modification to meet emissions standards through the life of the project)
- Provides the Plant with a more environmentally friendly and diverse generation portfolio
- Places almost all risk onto PPA provider. City pays for power, not for the operating and maintenance cost
- Frees up City capital to be used for other critical projects
- Begins replacing ICE sooner since the fuel cell will be on line by January 2012, as compared to ICE, which will take 2-4 years to install and become operational
- Property taxes generated to local schools, cities and districts
- Provides insurance for the fuel cell and the Plant in the event of any property damage or personal injury to others as a result of system operation

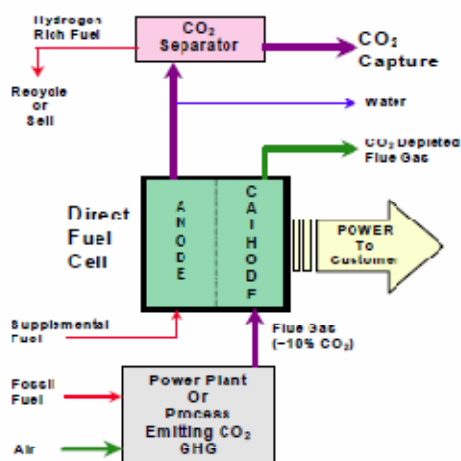


Figure 1. Direct Fuel Cell-based CO₂ Separation and Power System Concept:
The system can be used with a variety of CO₂-containing greenhouse gases (GHG)

From the Frying Pan to Fuel: SFPUC's Renewable Energy Program (II) (cont. from pg. 6)

The 2011 FOG Ordinance went into effect on April 1, 2011. With the FOG Ordinance in place, food establishments will have to comply by installing the proper grease capturing device based on their cooking equipment and plumbing fixtures, which equate to an establishment's "FOG discharge risk." For example, Category 4 FOG Dischargers are those establishments that only re-heat prepared foods, and therefore do not require any capturing equipment. Category 1 FOG Discharges are those that have a high FOG discharge risk and do not have approved grease capturing equipment in place. Category 1 FOG Discharges will be required to install a Grease Removal Device or a Gravity Grease Interceptor within 60 days after the Ordinance goes into effect, and can subsequently take advantage of a sewer rate reduction to offset installation costs.

With the Ordinance in place, food establishment cannot:

- Dispose of any type of FOG or food containing FOG directly into drains
- Install garbage grinders (existing garbage grinders will have to be removed)
- Discharge wastewater at a temperature higher than 140 °F
- Discharge dishwasher wastewater through grease capturing equipment
- Use biological additives in drains leading to grease capturing equipment

Waukesha Engine Emissions Control Schema (cont. from pg. 9)

Emission Calibration

By 2012, the air board is going to require this engine to be at or below 70ppm NO_x and SBSA is maintaining those levels right now though the whole KW range.

Starting at 200KW, the mechanic takes note what step the throttle is in and looks at the ECOM-PLUS 5 gas analyzer to see how much NO_x is being produced. If the NO_x is 140ppm and the percent oxygen is a 4.3%, he will insert a new percent oxygen value into the PLC, maybe 4.9%, and wait a while for the changes to take effect. As the air valves open, more air is being injected into the engine, the cylinder temperature starts to drop, percent oxygen goes up to 4.9%, and now the NO_x is at 80ppm. The mechanic will continue this process until the desired NO_x level is met. Next the mechanic will increase the KW to get the TPS into the next step and again calibrate to maintain at or below 70ppm NO_x. After going through all of the TPS steps the engine now is in compliance. At the 12th step, the engine is making the maximum KW possible.

What's great about this schema is if the BTU of the digester gas changes (and it will), the oxygen sensor will pick that up. If you have higher BTU, more oxygen is consumed resulting in higher cylinder temperatures. The emission's PLC will add a little more air to compensate for BTU change, thus not violating emissions limits.

Important Dates

Next BACWA AIR Committee Meetings at the CH2M HILL Offices in Oakland:

- April 20th, 2011
- July 20th, 2011 (tentative)

Other important dates:

- Written comments on the proposed EPA rule to defer permitting of biogenic emissions under the Tailoring Rule: May 5th, 2011
- Final compliance deadline for diesel vehicles subject to CARB Fleet Rule for Public Agencies and Utilities: December 31, 2011.

About Our Organization

BAY AREA CLEAN WATER AGENCIES (BACWA)

BACWA agencies are the day to day urban water resource managers and the stewards of the San Francisco Bay estuary. As such, it is the goal of BACWA to ensure that local and regional decisions makers understand and use scientifically sound data to make management decisions that will result in improvements and enhancement of the Bay estuary.

It is the goal of BACWA that all resource managers and decision makers understand the watershed dynamics and embrace a regional approach to water quality issues recognizing that regional problems call for regional solutions.

AIR ISSUES & REGULATIONS COMMITTEE (AIR)

The Air Issues and Regulations Committee (AIR) develops, analyzes and distributes scientific information regarding air pollution and climate change issues related to operation and maintenance of publicly owned treatment works.

A BIG THANKS to our Contributing Authors

BOB MOUDERRES (City of San Jose)

Bob authored an article about the San Jose/Santa Clara Water Pollution Control Plant biogas fuel cell co-generation system. Thank you Bob!

ZACKARY KAY (City of Santa Rosa)

Zackary and his team co-authored a white paper about an interesting site assessment at the City of Santa Rosa biosolids compost facility to evaluate the air emissions from the facility's biofilter. Thank you Zackary!

TIM SMITH & GEURT VAN DE KERK (SUSTAINABLE SOCIETY FOUNDATION)

Tim and Geurt contributed an article about the ongoing evaluation of sea level rise for California, Oregon, and Washington for the years 2030, 2050 and 2100. Thank you Tim and Geurt!

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Manisha, Karri, and Nohemy authored articles about SFPUC's progressive approach to FOG waste collection and digestion. Thanks to all of you!

KEN KAUFMAN (SBSA)

Ken authored an article about SBSA's onsite engine emissions control schema to meet regulatory requirements. Thank you Ken!

JACQUELINE KEPKE (CH2M HILL)

Jackie lent us articles she had written about CWCCG's recent news and other items that CWCCG has addressed. Thank you Jackie!

BACWA AIR also would like to thank Stacy Kika/USEPA, SCAP, Tim Smith and Geurt Van De Kerk for articles which have been republished in this newsletter.

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