



**BOARD OF COMMISSIONERS MEETING  
TUESDAY, SEPTEMBER 8, 2015, 9:30 A.M.  
ROBERT E. HIBBITTS MEETING ROOM  
1924 COURTHOUSE, NEWTON, N.C.**



The Board approved a bid award for a Landfill Gas Equipment Station to SCS Field Services of Reston, Virginia in the amount of \$1,068,500; authorization of the sole source exemption and purchase of a DIA.NE XT3 Engine Control System Upgrade and Fuel Blending Package from Nixon Energy Solutions in the amount of \$489,498; approval of an agreement with the project design engineer, CDMSmith, for construction administration, inspection, and start-up, commissioning, and certification services for \$49,300; and approval of a budget revision in the amount of \$950,148 for a project total of \$1,714,148, which includes an additional \$106,850 for a 10% construction contingency.

In August 1998, Catawba County chose to purchase GE Jenbacher methane gas powered engine-generator sets (gensets) to destroy the methane gas generated within the landfill by converting the captured methane gas into electricity and selling the electricity to Duke Energy. Currently, there are three methane gas powered gensets located at the Blackburn Resource Recovery Facility. The 1998 Jenbacher gensets came equipped with DIA.NE Engine Control Systems. Along with the GE Jenbacher gensets, a landfill gas collection system was also installed. This system included the current landfill gas compression skid and flare. The current DIA.NE Engine Control Systems are antiquated and the landfill gas compression skid has been operating 24 hours a day every day since its installation, with only minimal downtime. Both the 1998 DIA.NE Engine Control Systems and existing skid and flare have reached the end of their useful lives after nearly 17 years of change in technology and time of use.

The replacement of both the landfill gas compression skid and flare and the DIA.NE Engine Control System were planned Solidwaste Capital Improvement Projects. Initially, staff planned to replace the landfill gas compression skid and flare and the DIA.NE Engine Control System as separate projects. However, updating the equipment together increases the efficiency and operability of the new landfill gas compression skid and flare. Staff believes it is in the County’s best interest to accelerate the replacement of the DIA.NE Engine Control System in order to fully optimize the overall landfill gas to energy system and ensure adherence to applicable environmental permits.

On May 21, 2015, bids were received on the Landfill Gas Equipment Station Replacement. The project includes the manufacture, delivery, installation and commissioning of a Gas Compression and Conditioning System along with the supporting civil and electrical work. The key reasons associated with replacing the system include improvements in system operations, establishment of a landfill gas treatment system, and air quality compliance monitoring. Below is an abbreviated bid tabulation from the May 21, 2015 bid opening:

<b>Contractor</b>	<b>Bid</b>
<b>SCS Field Services</b>	\$1,068,500
<b>CB&amp;I</b>	\$1,087,147
<b>Advance One Development</b>	\$1,191,500
<b>Methuen Construction</b>	\$1,232,387

Based upon a recommendation letter from CDM-Smith, staff recommends awarding the bid to SCS Field Services of Reston, Virginia in the amount of \$1,068,500.

In accordance with Federal Regulations 40 CFR 60.752, the active gas collection and control system shall be designed to “handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment”. The average gas flow rate at the Blackburn Landfill ranges between 1,100 scfm (standard cubic feet per minute) and 1,400 scfm. The current gas collection and control system has a capacity of 1,400 scfm but the current flare has a rated capacity of only 1,200 scfm. In the event that all three engines were not operational, the current flare would not be capable of fully controlling the landfill gas in compliance with 40 CFR 60.752. Any uncontrolled emissions would be considered a violation of the County’s Title V Air Quality permit and potentially subject the County to fines and other penalties. Increasing the flare capacity will minimize fugitive emissions in the event that all three engines are not operational.

Accurate readings of landfill gas flow rate, cumulative landfill gas flow, temperature, and methane content for the engines and the flare are critical to meeting the air quality compliance monitoring requirements associated with the County's Title V Air Quality permit and the Greenhouse Gas Mandatory Reporting Rule requirements. The current gas collection and control system was installed in 1998, is undersized to meet the current Air Quality Permit Requirements, and does not have modern monitoring equipment that will allow more accurate, automated data collection and reporting.

The new system will not only meet the Air Quality permit requirements, it will allow for infinite adjustment capability of the flare, which will allow landfill gas flow to be split between the engines and flared during conditions where the landfill gas flow rate is above the capacity of the operating engines. Additional flow will be handled by the flare without causing unstable flare operation, venting of uncontrolled landfill gas to the atmosphere, or the engines shutting down due to large pressure drops associated with sudden diversion of flow away from the engines to the flare. The upgraded gas collection and control system will improve control of the well field vacuum and engine pressure requirements for more consistent operations. Automatic vacuum control of the well field will require fewer manual adjustments to the well field resulting in less documentation and reporting. The upgraded gas collection and control system is designed to meet EPA's presumptive definition of a treatment system as a system that filters the landfill gas to an absolute rating of 10 microns, dewateres the landfill gas to provide a 20 degree Fahrenheit reduction in dew point temperature, and compresses the landfill. Having the landfill gas conditioned through such a treatment system will eliminate the need to consider the engines as landfill gas control devices and reduce much of the Air Quality testing, monitoring, recordkeeping, and reporting associated with the use of the engines themselves. The upgraded gas compression and conditioning system is anticipated to meet the County's needs for the next 15 years.

Computer technology has a major role in the monitoring and fine tuning of the methane gas fired gensets. Each genset has a computer control system (DIA.NE system) that monitors multiple parameters within the gensets (i.e. exhaust, water, and oil system temperatures) to ensure the gensets are operating efficiently, safely and within guidelines. Additionally, the DIA.NE system regulates the fuel to air mixture of the gensets, which is critical in meeting Federal and State Title V Air Quality regulations by insuring the methane gas is completely destroyed. Computer technology is also used on the site to constantly measure and calculate the amount of energy sent to the power grid. This information, coupled with computer diagnosis, enables the operator to trouble shoot and correct problems before they escalate and damage the engines and/or cause or create EPA violations. Therefore, replacement of the DIA.NE system is planned to occur in 15-year intervals.

The current DIA.NE system, hardware and software, is now over 15 years old, is obsolete and cannot be updated to accommodate current computer operating systems that are needed to meet the strict monitoring and recording requirements of the County's Title V Air Quality Permit. The County's technicians are currently relying upon a rudimentary paging system to alert them to problems with the gensets. With the new Landfill Gas Equipment Station, County technicians will no longer be able to rely on a paging system for addressing problems; they will need full remote access to the Gensets and Landfill Gas Equipment Station to diagnose alerts and determine the level of response that is needed to avoid or abate permit violations. Full remote access will reduce operational cost through reduced overtime wages due to the technicians having the ability to address problems remotely when diagnosing alerts/alarms.

GE Jenbacher and Nixon Energy Solutions have submitted a proposal to address upgrading the engine control system. This upgrade will allow for installation and operations of GE's most up to date proven engine control system (DIA.NE XT3), providing maximum visibility to current operating conditions, operational trend data, and improved ease of use. Access to this control data will allow site personnel to diagnose current or potential engine issues more efficiently, minimizing down time. In addition, the new engine control system components and fuel blending package will drastically mitigate current parts supply challenges of the existing obsolete system. Total cost per engine will be \$163,166 or \$489,498 for all three engines. Nixon Energy Solutions is the exclusive distributor for GE Jenbacher renewable energy generators including all control systems, operation systems, and parts for generators powered by natural gas, landfill gas, biogas and other site-specific gases.

North Carolina General Statute 143-129 allows an exemption from bidding for purchase contracts when performance or price competition for a product are not available; when a needed product is available from only one source of supply; or when standardization or compatibility is the overriding consideration. This exemption requires governing body approval. A record must be maintained of purchases made under this exemption. In this instance, the engine control system and fuel blending package are only available from Nixon Energy Solutions. No ad valorem tax proceeds go into the Solid Waste

Management Enterprise Fund. The Board's Policy and Public Works Subcommittee recommends the Board actions listed above.

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