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TO: Barbara Levin Bergman
Chair, Ways & Means Committee

THROUGH: Robert E. Guenzel
County Administrator

FROM: Kerry Sheldon
Administration

DATE: January 23, 2008

SUBJECT: Central Plant implementation contract

BOARD ACTION REQUESTED:

It is requested that the Washtenaw County Board of Commissioners authorize the Administrator to sign the contract with Chevron Energy Solutions in the amount of \$6,440,016 for the period of February 7, 2008 to August 31, 2009. Under this contract, Chevron Energy Solutions will:

1. Construct a Central Plant that will serve the heating and cooling needs of the Washtenaw County Correctional Facility. The Central Plant will contain a biomass-fueled boiler, among other equipment.
2. Implement a range of other energy and water efficiency projects at the facility.

BACKGROUND:

Due to the impending expansion and renovation, the Washtenaw Correctional Facility was excluded from the 2004 performance contract that implemented a wide array of energy efficiency improvements throughout eighteen (18) County facilities. Now that the Correctional Facility project is underway, it is timely to consider the energy component of the building.

In September 2007, a competitive Request for Proposals was issued to engage an energy services company for a Comprehensive Energy Audit (CEA) of the Correctional Facility. The CEA would provide investment-grade engineering and financial data on the construction of a Central Plant that would serve the heating and cooling needs of the facility, in part through a biomass-fueled boiler. Additionally, the CEA would identify and evaluate other potential water and energy efficiencies. Chevron Energy Solutions was selected, and the contract for the CEA was authorized by the Board of Commissioners (Resolution # 07-0221). The CEA was

completed in December 2007, and recommended a number of fiscally and environmentally responsible measures – as described in the Discussion section, below.

In terms of communications, presentations to the Board of Commissioners were made on November 7 (introducing the project) and December 5, 2007 (summarizing the results of the CEA). These presentations and the contents of the CEA report were also shared with the chief elected officials of all Cities, Villages, and Townships in the County, the Ecology Center, the facilities team at the St. Joseph Mercy Health System, and McKinley Properties. Both in-person and verbal/email communications were held with many of those listed above as well, following up on the information exchanged. Questions were assembled from all parties, and their answers researched; a packet of information containing responses to those questions and other information was shared with the Board of Commissioners – and subsequently, again, all chief elected officials – on January 11, 2008.

DISCUSSION:

A growing body of evidence supports biomass as an attractive and viable fuel source for the future. The term “biomass” can refer to liquid (e.g., ethanol), gas (e.g., methane), or solid (e.g., wood chips) fuel. The common characteristic among all three categories of biomass is that the fuel is an organic-based material that is renewable. As a renewable resource, biomass is considered carbon-neutral. Take wood chips, for example. While a tree grows, carbon dioxide is absorbed and oxygen is released through photosynthesis. Whether the tree falls in the forest and decomposes over time, or whether the wood from that tree is burned as a fuel source, the carbon is released into the atmosphere, and the carbon is available for uptake by a young, growing tree. In this way, the carbon cycle is closed, making this resource “renewable” and “carbon-neutral.”

In contrast, fossil fuels are non-renewable and not carbon neutral – once a fossil fuel is burned, it is gone, and the carbon that had previously been sequestered in that fuel is released. The creation of fossil fuels takes millennia, and hence these fuels are not considered to be renewable. For this reason, the impact of using renewable wood chips in place of non-renewable natural gas as a heating fuel at the Correctional Facility will result in 1,456,400 pounds per year of carbon dioxide will be rendered neutral.

In addition, the other energy and water efficiency projects that will be implemented under the contract (rebuilding the air handling units; installing the cooling tower makeup water meter; implementing lighting controls throughout the facility; integrating the domestic hot water system with the central heating/cooling plant; installing a laundry water recirculation system) will result in a reduction of 923,134 kilowatt-hours (kWh) of electricity, which translates into the following environmental benefits:

- Reduction of 2,076,000 lbs/year of carbon dioxide (a major greenhouse gas)
- Reduction of 18,000 lbs/year of sulfur dioxide (a precursor of acid rain)
- Reduction of 5,540 lbs/year of nitrogen oxides (contributors to smog and ground-level ozone)
- An undetermined quantity of particulates that result from coal combustion – the primary fuel used in electrical generation in Michigan

Due to these reasons, the implementation of these measures in their entirety is expected to secure LEED certification for the project. This feat is not to be underestimated. Although the Board of Commissioners has a policy of achieving LEED certification for new construction and major renovations, we have not been successful in doing so to date. Achieving LEED certification on a project of this size and complexity (i.e., a correctional setting that requires both retrofit components and new construction) is a distinguished achievement of which the Board of Commissioners should be extremely proud.

Additionally, biomass is a locally available fuel source. It is estimated that using wood chips for fuel at the Correctional Facility will result in an infusion of \$35,000 per year into the local economy for the raw material alone. Conversely, if the Correctional Facility were to continue to be heated solely with natural gas, and no efficiencies were implemented to reduce the energy consumption, the County would pay nearly \$240,000 annually to utility companies for fossil fuel energy that is predominantly imported from other states and/or countries.

All that said, there is no such thing as a perfect fuel. The use of biomass presents many significant environmental benefits as described above, and the resultant emissions are comparable to natural gas in terms of the criteria pollutants as defined in the Clean Air Act of 1970 (amended 1990). However, wood burning does result in an increased emission rate of particulate matter when compared with natural gas. These emissions can be controlled to a large degree by incorporating controls into the design of the wood-burning boiler. The County proposes to integrate both mechanical collectors (in the form of multi-clone devices that circulate exhaust gases at high velocity such that the particulate matter precipitates out and is collected for disposal and an extended burn chamber (that routes the exhaust gas through the combustion chamber a second time, enabling further “flashing off” of particulate matter). These controls, in addition to the high temperature in the combustion chamber itself (1800° F) will combine to reduce the particulate emissions of the boiler to 0.88 tons/year.

The total quantity of particulate matter emissions from all sources in Washtenaw County as measured by the Environmental Protection Agency in 2001 is 13,808 tons per year. The incremental addition of 0.88 tons/year represents 0.0064% (6.4 *one-thousandth* of one percent) of the total annual emissions.

Finally, seventy-five percent (75%) of the electrical generation in Michigan is provided through coal-fired power plants. Coal combustion is one of the most intensive generators of particulate matter on a unit-for-unit basis. Given that air quality is regional in nature, it is reasonable to conclude that the reduction in electrical demand that will result from the energy efficiency improvements at the Correctional Facility will result in a decrease in the total particulate emissions of the region.

IMPACT ON HUMAN RESOURCES:

None

IMPACT ON BUDGET:

The total project cost is \$6,440,016, of which \$2,890,405 will be contributed from the existing funds obtained through bond issuance for the Correctional Facility project (authorized by the Board of Commissioners via Resolution # 05-0130 on August 3, 2005). The remaining funds necessary to complete the Central Plant project will be obtained by increasing the magnitude of the District Court bond issuance (currently estimated at \$12.6 million) in early April 2008 by \$3,549,611.

The bond payment for this incremental increase is approximately \$270,000 per year. The energy usage reduction generated through the project's completion will result in approximately \$240,000 in cost savings annually, which is conservatively projected to increase by 3% per year. These funds, instead of being directed to the utility companies, will instead be transferred from the Facilities Management Operations & Maintenance Budget to the Capital Reserves in order to offset the bond payment. In this way, the Capital Reserves are made whole and there the General Fund impact is both negligible and short-term.

In year six (6) following completion of construction, the energy savings are projected to exceed the bond payment, rendering the project cash flow positive. This positive cash flow recoups the small contributions from the General Fund (Operations & Maintenance Budget) that were required at the outset.

IMPACT ON INDIRECT COSTS:

None

IMPACT ON OTHER COUNTY DEPARTMENTS OR OUTSIDE AGENCIES:

None

CONFORMITY TO COUNTY POLICIES:

This request conforms to County policy.

ATTACHMENTS:

Resolution

Implementation Contract with Chevron Energy Solutions

A RESOLUTION AUTHORIZING THE ADMINISTRATOR'S SIGNATURE ON A CONTRACT WITH CHEVRON ENERGY SOLUTIONS IN THE AMOUNT OF \$6,440,016 FOR THE PERIOD OF FEBRUARY 7, 2008 THROUGH AUGUST 31, 2008 TO IMPLEMENT ENERGY AND WATER EFFICIENCY PROJECTS AT THE WASHTENAW COUNTY CORRECTIONAL FACILITY, INCLUDING THE INSTALLATION OF A CENTRAL HEATING AND COOLING PLANT THAT CONTAINS A BIOMASS-FUELED BOILER

WASHTENAW COUNTY BOARD OF COMMISSIONERS

February 6, 2008

WHEREAS, due to its upcoming renovation and expansion, the Washtenaw County Correctional Facility was excluded from the 2004 performance contract that implemented a wide array of energy efficiency improvements at eighteen (18) County facilities; and

WHEREAS, now that the architectural and engineering phase of the Correctional Facility's expansion and renovation is underway, it is timely to consider the building's energy demand and usage patterns; and

WHEREAS, holistic examination of a facility's energy usage considers all options for achieving mechanical/operational efficiencies as well as the integration of renewable energy technologies to the greatest extent practicable; and

WHEREAS, a Comprehensive Energy Audit (CEA) is a standard industry term used to describe such an examination, which results in investment-grade engineering and financial data for recommended projects; and

WHEREAS, Chevron Energy Solutions was identified through a competitive Request for Proposals process as the preferred vendor to complete a CEA, and the Board of Commissioners authorized a contract for this purpose via Resolution # 07-0221; and

WHEREAS, Chevron was directed to identify energy and water efficiencies as well as evaluate the construction of a Central Plant that would serve the heating and cooling needs of the Washtenaw County Correctional Facility, incorporating a biomass-fueled boiler(s) in order to accomplish a renewable energy component; and

WHEREAS, the CEA recommended a number of financially attractive energy and water efficiency projects, including: rebuilding the air handling units, installing the cooling tower makeup water meter, implementing lighting controls throughout the facility, integrating the domestic hot water system with the central heating/cooling plant, and installing a laundry water recirculation system; and

WHEREAS, the CEA also revealed that the construction of a Central Plant as described will result in a number of benefits: one, biomass is cost effective, as wood chips are approximately 1/3 the cost per unit of energy as natural gas; two, biomass is a renewable resource that is carbon-neutral, and its use at the Correctional Facility would render neutral 1,456,400 pounds per year of carbon dioxide; three, wood chips are an abundant and locally available resource, in contrast to fossil fuels that are imported from other states and countries; and

WHEREAS, the other energy and water efficiency projects would also result in significant environmental benefits, including the reduction of: 2,076,000 lbs/year of carbon dioxide (a major greenhouse gas), 18,000 lbs/year of sulfur dioxide (a precursor of acid rain), 5,540 lbs/year of nitrogen oxides (contributors to smog and ground-level ozone), and an undetermined quantity of particulates that result from coal combustion; and

WHEREAS, seventy-five percent (75%) of the electrical generation in Michigan is provided through coal-fired power plants, and coal combustion is one of the most intensive generators of particulate matter on a unit-for-unit basis; and

WHEREAS, air quality is regional in nature, and it is reasonable to conclude that the reduction in electrical demand that will result from the energy efficiency improvements at the Correctional Facility will result in a decrease in the total particulate emissions of the region; and

WHEREAS, in addition to the environmental benefits described above, the project in its entirety would result in an annual cost savings of nearly \$240,000 the first year; and

WHEREAS, the total project cost will be \$6,440,016, of which \$2,890,405 will be advanced from the existing budget for the expansion and renovation of the Correctional Facility, as the Central Plant project will resolve a considerable portion of the infrastructure needs currently budgeted within the existing project; and

WHEREAS, the remaining \$3,549,611 will be bundled with the upcoming bond issuance (currently scheduled for early April 2008) for the District Court project; and

WHEREAS, this incremental increase in magnitude will result in an increased principal and interest payment of approximately \$270,000 per year; and

WHEREAS, because the bond payment remains level each year, and the energy savings increase at a conservative rate of 3%, the project realizes a positive cash flow in year six (6); and

WHEREAS, each year, funds will be transferred from the Facilities Management Operations & Maintenance Budget to the Capital Reserve fund in order to support the bond payment; and

WHEREAS, these funds otherwise would have been paid to the utility companies for the unmitigated energy demand of the Correctional Facility, and hence there is no impact on the

General Fund given that the energy savings in years seven (7) through twenty (20) of the project greatly offsets the small contribution required in the first few years; and

WHEREAS, this matter has been reviewed by the Finance Office, Corporation Counsel, County Administrator's Office and Ways & Means Committee;

NOW THEREFORE BE IT RESOLVED that the Washtenaw County Board of Commissioners hereby authorizes the Administrator to sign the contract with Chevron Energy Solutions in the amount of \$6,440,016 for the implementation of energy and water efficiency projects at the Washtenaw County Correctional Facility, including the installation of a central heating and cooling plant that contains a biomass-fueled boiler for the period of February 7, 2008 through August 31, 2008.

BE IT FURTHER RESOLVED that this project depends on the sale of bonds for a funding source, and that hence this contract will become effective contingent on the sale of bonds.

BE IT FURTHER RESOLVED that in order to provide this funding source, the District Court bond issuance (anticipated for early April 2008) will be increased in magnitude by \$3,549,611.

BE IT FURTHER RESOLVED that, upon initiation of the Central Plant project, the Board of Commissioners authorizes the transfer of \$2,890,405 from the budget of the current Correctional Facility project to the Central Plant project in order to limit the amount of additional bonds that need to be sold.