

Limited Environmental Review

A. Project Identification:

Name: City of Mount Vernon
Wastewater Treatment Plant Upgrades

Address: Mr. David C. Glass
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Mount Vernon, OH 43050

Loan No.: CS390639-0003

B. Summary/Existing Need:

Septage Receiving Facilities:

The City of Mount Vernon currently regularly receives septage at its Wastewater Treatment Plant (WWTP) at 3 Cougar Drive. It is estimated that an average of 6,100 gallons are received on a daily basis. Septage haulers collect the waste from residential septic tanks, portable toilets, etc., and pay the City to discharge that waste into a receiving manhole at the WWTP located outside of the existing Screen Building. Recreational vehicles (RVs) are permitted to empty there at no charge. Records and billing are performed on an "honor system." The septage haulers complete a form stating the volume of waste discharged and the source of the waste. It is also assumed that the septage haulers are collecting solely from residential sources, as commercial and industrial sources are prohibited. The septage flows from the manhole to the influent splitter box, where it is mixed with the collection system influent. Besides this dilution, no pretreatment of the septage is performed prior to the influent screens. A "rock trap" grate had been provided in the manhole, but due to continual clogging, it has been removed. By dumping at this location, the septage passes through the screening, primary pumping, and grit removal processes, as well as the remainder of the downstream wet-stream treatment processes. However, there is currently no way to measure the quantity of septage received, and the discharges by septage haulers are creating load spikes in the treatment processes. Furthermore, the City must trust the estimates of the septage haulers with regard to the amount of septage that has been received.

In order to address these spikes, and in order to provide a complete, dedicated, and integrated septage receiving location for the region, the City is proposing the construction of new septage receiving facilities. The proposed septage receiving facilities would provide many benefits to the WWTP, including, but not limited to, the following:

- Storage of septage for flow balancing to address the load spikes.

- Storage of septage for testing prior to treatment.
- Storage of septage during wet-weather flow to ensure complete treatment and to reduce stress on the treatment processes.
- Removal of rocks, trash, and debris from entering the WWTP streams.
- Operational flexibility for treating septage via the wet-stream or solids-handling process streams.
- Automated monitoring and billing of actual discharge quantities.
- Increased revenue for the WWTP.

Primary Pumps:

The existing Pump and Control Building at the WWTP currently has four vertical open shaft primary pumps. The existing primary pumps were replaced as part of the 1972 Secondary Treatment Plant construction project and have been in service for approximately 36 years. The pumps are located upstream of the grit removal tank and are subject to abrasive wear due to grit. The pumps have been rebuilt several times over their service life. At present, the pump manufacturer, Allis Chalmers, is no longer in business, and replacement parts for the existing pumps are no longer available. If a pump part fails, it must be specially fabricated in a machine shop. As a part of the proposed project, these pumps will be replaced.

Secondary Pumps:

The existing Secondary Treatment Building at the WWTP currently has four secondary pumps. The existing secondary pumps were also installed as part of the 1972 Secondary Treatment Plant construction project and have been in service for approximately 36 years. The pumps are located downstream of the grit removal and primary treatment processes and do not see the same abrasive wear conditions as the primary pumps. Based on pump inspections completed as part of the design effort, the pumps were found to be in excellent condition. In their current condition, it is anticipated that the secondary pumps will be serviceable for another 10 to 15 years. However, similar to the primary pumps, the pump manufacturer, Allis Chalmers, is no longer in business and replacement parts for the existing pumps are no longer available. If a pump part fails, it must be specially fabricated in a machine shop, so the issue with respect to replacement parts remains for the existing pumps. However, parts may be fabricated locally by a local pump shop, if necessary. Since the secondary pumping service conditions are not severe, the existing pumps are in very good condition, and replacement parts can be fabricated locally, these pumps are only being upgraded as part of the proposed project.

Electrical Distribution System:

The City's most recent National Pollutant Discharge Elimination System (NPDES) permit, with an effective date of January 1, 2010, includes a schedule of compliance that requires the City to complete "the upgrades necessary to the back-up power supply sufficient to operate the secondary treatment operations of the wastewater treatment plant." In addition, the 2008 National Electrical Code includes Article 708 entitled "Critical Operations Power Systems." This National Electrical Code article includes stringent requirements for power systems for "critical infrastructure." Wastewater treatment facilities are included as critical infrastructure under the National

Infrastructure Protection Plan that was developed in response to the 2003 Homeland Security Presidential Directive HSPD-7, Critical Infrastructure Identification, Prioritization, and Protection.

As part of this project, the following electrical distribution system improvements are being implemented in order to comply with both the aforementioned schedule of compliance and Article 708 of the National Electrical Code.

Instrumentation and Controls:

The existing programmable logic controller (PLC) system at the wastewater treatment plant includes the following major components:

- Screen Building PLC Rack
- Pump and Control Building PLC Rack
- Secondary Treatment Building PLC Rack (Aeration Blower Master Control Panel)
- Control Room HMI Workstation
- Superintendent's Office PC/HMI Workstation.

As part of this project, these systems will remain as installed. However, many of the existing instruments at the treatment plant will be replaced with new instruments, which will be tied into the PLC system. The remaining process equipment and instruments will also be tied into the PLC system for remote monitoring and PLC control at the HMI workstations.

Remote Pump Station Telemetry:

The City of Mount Vernon owns, operates, and maintains eleven remote pump stations located throughout the collection system. Eight of the eleven stations are equipped with auto-dialers, two are provided with telemetry systems, and one station is currently not monitored. This equipment will be upgraded to provide consistency between the stations and to provide the capability of monitoring alarms and operational status at the wastewater treatment plant.

C. Project Description:

Septage Receiving Facilities:

The proposed septage receiving facilities will be constructed just west of the existing Screen Building between the main plant entrance and the exit located to the northeast. A new Septage Receiving Building will be constructed to house the septage screening equipment, screenings dumpster, and associated electrical equipment, and a Septage Receiving Truck Scale will be constructed to monitor the actual discharge quantities. New Septage Receiving Wet-Wells will be constructed to provide for the aforementioned storage and operational flexibility.

The new facilities will have the following features:

- Trucks will be able to pull into the WWTP through the main plant entrance without having to block traffic on Cougar Drive.
- Pretreatment for removal of rocks, trash and other debris by processing through a ¼-inch opening cylindrical bar screen will be provided.

The screen will also include a screenings washer and compactor. The compacted screenings material will be discharged to a dumpster, and then sent to a landfill. This will accommodate directing the pretreated septage to various plant processes without adding debris to them. A set of truck scales will be provided for recording gross-net-tare weights so that the haulers can be properly billed. A truck scale authorization panel will be provided and will communicate with the septage screening equipment system in order to provide for an automated monitoring and billing system.

There will be two septage discharge lines from the screening equipment, each one going to a separate wet-well within the new Septage Receiving Wet-Wells. Each wet-well will have a line that will direct the septage to a manhole on the plant influent line upstream of the existing Screen Building. Each wet-well will also include a submersible pump that will allow the septage to be pumped to either the existing Digesters or Sludge Holding Tanks. This will give the WWTP the flexibility to direct the septage as appropriate for the most effective treatment process management. It will also accommodate directing septage away from the wet-stream process train during wet-weather, thus maximizing the amount of flow that can be treated in the plant during wet-weather events.

Primary Pumps:

These pumps will be replaced with four new submersible pumps. One pump will be used as a standby. Each pump will be rated at 4,000 gallons/minute (gpm) for a firm pumping capacity of 12,000 gpm, or 17 million gallons/day (mgd). The pumps will be provided with variable speed drives to adequately cover the range of plant influent flows anticipated. During the normal operating mode, pump speed will be adjusted to maintain a level set point in the existing wet-well.

The following improvements associated with the primary pumps will also be implemented:

- The suction piping for Primary Pump Nos. 1 and 2 will be increased in size from 10-inch and 12-inch diameter to 16-inch diameter.
- The discharge piping for Primary Pump Nos. 1 and 2 will be increased from 12-inch diameter to 14-inch diameter.
- New isolation valves will be provided on the suction and discharge side of all four pumps. Suction side valves will be full-port gate valves. Discharge side valves will be plug valves.
- New check valves will be provided on the discharge side of all four pumps. The check valves will be weighted-swing check type valves. The existing wet-well will be lined with a new corrosion protection coating system.
- Wall-mounted jib cranes will be provided adjacent to the pumps and a new monorail and hoist will be provided on the upper level of the Pump and Control Building to facilitate pump removal and replacement.

Secondary Pumps:

The existing Secondary Treatment Building at the WWTP currently houses a quantity of four secondary pumps. The existing secondary pumps were installed as part of the 1972 Secondary Treatment Plant construction project and have been in service for

approximately 36 years. As with the primary pumps, the pump manufacturer, Allis Chalmers, is no longer in business and replacement parts for the existing pumps are no longer available. If a pump part fails, it must be specially fabricated in a machine shop. The issue with respect to replacement parts remains for the existing pumps. However, these pumps are located downstream of the grit removal and primary treatment processes and do not see the same abrasive wear conditions as the primary pumps. Based on pump inspections completed as part of the design effort, the pumps were found to be in excellent condition. In their current condition, it is anticipated that the secondary pumps will be serviceable for another 10 to 15 years. Since the existing pumps are in very good condition, and replacement parts can be fabricated locally, these pumps are only being upgraded as part of this project.

The existing motors and hydraulic type variable speed drives on Secondary Pump Nos. 2 and 3 will be removed and the existing motors on Secondary Pump Nos. 1 and 4 will be removed. New motors and electronic type variable speed drives will be installed on all four existing secondary pumps. Each of the existing pumps is rated at 3,000 gpm for a firm pumping capacity of 9,000 gpm, or 13 mgd.

Electrical Distribution System:

As part of this project, the following electrical distribution system improvements are being implemented in order to comply with both the aforementioned schedule of compliance and Article 708 of the NEC:

- New main power distribution switchgear will be located in an outdoor walk-in type enclosure located adjacent to a new generator and automatic transfer switch. The switchgear, and the feeders from the switchgear, will be provided with ground fault protection to prevent a ground fault condition in one area of the plant from shutting down the entire plant power system. A new utility-provided transformer will also be installed.
- The automatic transfer switch will also be located in an outdoor walk-in type enclosure, will include a load bypass switch, and will be listed for emergency use.
- The new generator will be 900 kW prime rated / 1,000 kW standby rated and will be capable of supplying power to the entire treatment plant. The generator will be provided with a belly-type double-wall sub-base fuel oil tank with sufficient capacity to provide for 72 hours of continuous full load operation.
- The new generator will be provided with a non-walk-in type outdoor weatherproof sound attenuating enclosure as supplied by the generator manufacturer. Controls will be provided with the generator for remote monitoring of generator status at the HMI workstations.
- New motor control centers (MCCs) will be provided in the Pump and Control Building, Secondary Treatment Building, and Digester Building. The new MCCs will be installed in separate rooms in the existing buildings and restricted to qualified personnel only in accordance with the National Electric Code's requirements for Arcflash.

Once the new switchgear, MCCs, standby generator and appurtenances are installed, existing loads will be transferred from the existing plant's electrical distribution system to the new electrical distribution system. When the last loads are transferred, the

existing switchgear, MCCs, standby generators and appurtenances will be removed.

Instrumentation and Controls:

As part of this project many of the existing instruments at the treatment plant will be replaced with new instruments, which will be tied into the PLC system. The remaining process equipment and instruments will also be tied into the PLC system for remote monitoring and PLC control at the HMI workstations. In order to tie the remaining process equipment and instruments into the PLC system, new PLC Racks and HMI workstations will be provided as summarized below:

- Digester Building PLC Rack
- Secondary Treatment Building PLC Rack
- Secondary Treatment Building HMI Workstation
- Pump and Control Building PLC Rack expansion.

Remote Pump Station Telemetry:

As part of this project, the auto-dialers will be eliminated and new telemetry systems will be installed. In addition, to assure consistency between all pump stations, the existing telemetry systems at Arch Avenue and Clinton Road will also be replaced, resulting in all eleven pump stations being provided with the same equipment and monitoring the same inputs. These improvements will provide consistency between the stations and will provide the capability of monitoring pump station alarms and run status at the wastewater treatment plant.

D. Estimated Project Cost:

The total cost for this project is estimated to be approximately \$8,885,836. The City of Mount Vernon is expected to receive \$1,564,833 as an interest discount to pay for the construction of the septage receiving facilities. The remaining \$7,321,003 will be funded by the WPCLF.

The City of Mount Vernon qualifies for a WPCLF standard rate (3.28%), 20-year low interest loan. In addition, as a community that meets the criteria for one of Ohio EPA's special interest rate discounts, Mount Vernon's actual loan interest rate is expected to be less than this standard interest rate percentage. Mount Vernon will receive a reduction in its loan interest rate that reflects a savings equal to the as-bid principal and interest costs of these facilities having with the primary purpose of receiving, treating, and disposing of septage.

During the 20-year loan period, the City will save an estimated \$1,654,382 on the \$7,321,003 borrowed in interest payments by using WPCLF dollars at this rate, compared to a market rate of 5.03%. This savings is in addition to the \$1,564,833 that will be credited to the City in reduced interest for the construction of the septage receiving facilities.

The City of Mount Vernon has a population of 14,375. According to the 2000 Census, the median household income (MHI) for the Village is \$29,801. The monthly sewer rate for a household in the City of Mount Vernon using 7,756 gallons per month is

\$29.02, which represents 1.16% of the MHI. This rate is generally considered affordable, and no rate increases are necessary to fund this project.

E. Project Schedule:

WPCLF funding is anticipated to be awarded for the proposed project in January, 2011. Construction is anticipated to begin in February 2011, and is expected to be completed by September, 2012.

F. Public Participation:

This project has been discussed at several Mount Vernon Water and Wastewater Commission meetings and City Council meetings. Ohio EPA will issue a copy of its Limited Environmental Review (LER) decision and Finding of No Significant Impact for this project to interested parties. Finally, a copy of this LER document will be mailed to a random selection of thirty City of Mount Vernon residents and businesses near the proposed project area.

G. Planning Information:

The following agencies have been given an opportunity to comment on the proposed project:

Ohio Environmental Protection Agency
Ohio Historic Preservation Office
Ohio Department of Natural Resources

We have not received any negative comments from these agencies regarding this project.

H. Conclusion:

The proposed project meets the project type criteria for a Limited Environmental Review; namely, it is an action in a sewer community for the construction of septage receiving facilities and other wastewater treatment equipment improvements. Furthermore, the project meets the other qualifying criteria for a LER; specifically, the proposed project:

- *will have no adverse environmental effect and will require no specific impact mitigation*, as there are no known sensitive environmental resources within the proposed project area. The proposed project construction activities are primarily located within the confines of the existing, previously-disturbed WWTP footprint. Special attention will be given to disposing project generated soils in an environmentally acceptable manner. There will be no significant adverse effects as a result of project implementation, or the need for any additional mitigative measures beyond typical best management practices, since the project will entail work only within the existing WWTP facilities;

- *will have no effect on high-value environmental resources*, as construction will take place only within the WWTP, where no such resources are present;
- *is cost-effective*, as these proposed City of Mount Vernon WWTP improvements makes use of existing infrastructure, will help to improve the overall efficiency of the City's WWTP operations, and effectively assists in minimizing impacts to the environment and public health;
- *is not a controversial action*, as it will not increase user costs and there are no significant adverse environmental impacts. Additionally, there is no known public opposition to the proposed project;
- *does not create a new, or relocate an existing, discharge to surface or ground waters*, since the project only involves installation of equipment at the WWTP;
- *will not result in substantial increases in the volume of discharge or loading of pollutants from an existing source or from new facilities to receiving waters*, since the proposed project does not involve any change in pollutant loadings, discharges, or other activities that might increase system capacity. Rather, it proposes to construct a more effective and efficient sewage treatment system, and provide storage of septage to ensure complete treatment of all wet-weather flow for the WWTP, and;
- *will not provide capacity to serve a population substantially greater than the existing population*, since the project is not related to serving new growth, or inducing development.

In summary, the planning activities for the project have identified no potentially-significant adverse impacts. The project is expected to have no significant short-term or long-term adverse impacts on the quality of the human environment, or on sensitive resources (floodplains, wetlands, riparian areas, prime or unique agricultural lands, aquifer recharge zones, archaeologically or historically significant sites, or threatened or endangered species). Typical construction impacts, such as noise, dust, and exhaust fumes, will be short-term and addressed through the use of standard best management practices.

I. For further information, please contact:

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