PRELIMINARY ENGINEERING REPORT

FOR THE

CITY OF MOUNT VERNON
KNOX COUNTY, OHIO

WASTEWATER TREATMENT PLANT
IMPROVEMENT PROJECT

CEC Project #310-731

JULY 2021

Civil & Environmental Consultants, Inc.

Bridgeport 120 Genesis Boulevard | Bridgeport, WV 26330 | p: 304-933-3119 f: 304-933-3327 | www.cecinc.com

PRELIMINARY ENGINEERING REPORT
FOR THE
CITY OF MOUNT VERNON
KNOX COUNTY, OHIO
WASTEWATER TREATMENT PLANT IMPROVEMENTS PROJECT

INDEX

PRELIMINARY ENGINEERING REPORT
FOR THE
CITY OF MOUNT VERNON
KNOX COUNTY, OHIO
WASTEWATER TREATMENT PLANT IMPROVEMENTS PROJECT

I. PROJECT PLANNING

The City of Mount Vernon (The City) owns and operates wastewater conveyance and treatment facilities that service the City's residents, businesses, and industries. The City's wastewater treatment plant (WWTP) is permitted to treat and discharge wastewater at an average daily flow (ADF) of 5.0 million gallons per day (MGD) to Kokosing River and is located at 3 Cougar Drive, Mount Vernon, Ohio, Knox County. Currently the City's WWTP is having performance and operational issues with their two (2) anaerobic digesters and is having rising concerns with meeting anticipated future effluent nutrient limits (mainly phosphorus) with their current treatment process. The Ohio Environmental Protection Agency (OEPA) has indicated the potential phosphorus limit for the WWTP effluent discharge could be as low as 1.0 mg/l.

A. Location

The City of Mount Vernon owns and operates a wastewater collection system, Septic receiving station and WWTP in Knox County, Ohio. The City is located on US Route 36 and on the Kokosing River in Ohio.

A map showing the project location can be found on the following page.

B. Environmental Resources Present

Environmental clearance letters have been sent to the Ohio Division of Culture and History, the Ohio Division of Natural Resources, the US Fish and Wildlife Services, and Natural Resource Conservation Service via the USDA area specialists for comments or concerns regarding the project's impact on historical and archaeological resources, endangered species, wildlife resources, or other environmental concerns. Copies of the correspondence to each agency listed and their responses are included in Section VIII, 'Project Documents', of this report.

NORTH

SECONDARY TREATMENT UNIT #1

CHLORINE CONTACT TANKS

PROPOSED NEW LINEAR MOTION MIXERS AND NEW ROOF COVERS

WASTE WATER TREATMENT PLANT OFFICE/ADMINISTRATION BUILDING

PROPOSED ELOVAC–P RFP BUILDING

PROPOSED SLUDGE DE–WATERING AND POST LIME STABILIZATION

PROPOSED SLUDGE TRUCK LOADING BAY

SLUDGE HOLDING #1

SLUDGE HOLDING #2

AEROBIC DIGESTION

FINAL CLARIFIER #1

CONTACT ZONE

REAERATION

DIGESTER #1

DIGESTER #2

DIGESTER BUILDING

SCREENING BUILDING

SECONDARY TREATMENT BUILDING

SEPTAGE RECOVERY STATION

PUMP & CONTROL BUILDING

GRIT TANK

SETTLING TANK #1

SETTLING TANK #2

MAINTENANCE BUILDING

CONTACT ZONE

REAERATION

FINAL CLARIFIER #2

AEROBIC DIGESTION

PROPOSED ALUM TANKS

SETTLING TANK #3

SETTLING TANK #4

GARAGE

PRIMARY SLUDGE BUILDING

SECONDARY TREATMENT UNIT #2

PROPOSED BIO–SOLIDS STORAGE BUILDING

COUGAR DRIVE

NOTES

1. PROPOSED ALUM STORAGE TANKS ARE TO BE 8,500 GALLON EACH, DOUBLE–WALLED TANKS FOR APPROXIMATELY 30 DAYS PRC SUPPLY.
2. ALUM TO BE FED AT THE GRIT TANK EFFLUENT CHANNEL PRIOR TO FLOW SPLITTING TO THE (4) EXISTING PRIMARY SETTLING TANKS.
3. PROPOSED ALUM FEED PUMPS TO BE LOCATED IN THE EXISTING PUMP AND CONTROL BUILDING.
4. PROPOSED NEW STRAIN PRESS AND HEAT EXCHANGES TO BE LOCATED IN DIGESTER BUILDING.

SCALE IN FEET

0 100' 200'

Civil & Environmental Consultants, Inc.
120 Genesis Boulevard · Bridgeport, WV 26330
Ph: 304.933.3119 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON, OHIO
PHOSPHORUS REMOVAL
PLANNING

EXISTING WATSE WATER TREATMENT PLANT SITE AND PROPOSED IMPROVEMENTS

DRAWN BY:	KES	CHECKED BY:	DRAFT	APPROVED BY:	DRAFT	EXHIBIT:
DATE:	JUNE, 2021	DWG SCALE:	1" = 100'	PROJECT NO:	310-731	2

C. Population Trends

According to operation records from the City of Mount Vernon, the city currently provides wastewater collection services to 7,510 customers. This includes 5,592 residential customers, 1,413 Non-residential customers and 505 Non-metered customers. The non-metered customers are estimated to contribute roughly 100 GPD per customer to the existing wastewater treatment plant.

METERED:

Type of Customers	*Number of Customers*	*Wastewater Usage/ Year (gallons)*	*Wastewater Usage/ Day (gallons)*	*Equivalent Dwelling Unit (EDU)**
Residential	5,592	303,871,260	832,524	2,082
Non- Residential	1,413	161,627,840	442,816	1,108
Total	7,005	465,499,100	1,275,340	3,190

EDU = Wastewater Usage of 400 Gallons per day, Per OEPA Guidelines

NON-METERED:

Type of Customers	*Number of Customers*	*Wastewater Usage/ Year (gallons)*	*Wastewater Usage/ Day (gallons)*	*Equivalent Dwelling Unit (EDU)**
Non-Metered	505	50,365	50,365	126
Total	505	18,383,225	50,365	126

EDU = Wastewater Usage of 400 Gallons per day, Per OEPA Guidelines

Based on U.S. Census Bureau Five year American Community Survey (ACS) results below the population within Ohio and Knox County has experienced slight increases. While the population within The City of Mount Vernon has decreased slightly when compared to 2010. There are no anticipated population change with the completion of the project.

Population	***Ohio***	***Knox County***	***Mount Vernon***
2010	11,512,431	60,201	16,864
2019	11,655,397	61,481	16,667
Percent Change	**1.24%**	**2.13%**	**-1.17%**

D. Community Engagement

The focus of this project is to upgrade and modernize the existing treatment technology located at the city's wastewater treatment plant in order to meet future permit limitations. The City holds council meetings every second and fourth Monday of the month. The City also holds utility commission meetings the first Tuesday of every month. This proposed project will be discussed and reviewed in both the city council and commission meetings.

II. EXISTING FACILITIES

A. Location Map

The City of Mount Vernon owns and operates a wastewater treatment and collection system within Knox County, Ohio. The city of Mount Vernon is located in Knox County along US Route 36 and on the Kokosing River. A location map of The City's existing treatment facility can be found in Section I "Project Planning", as well as, Section VIII.A "Project Documents" of this report.

B. History

The City' existing WWTP has been in operation since 1952 with the construction of the anaerobic digestion facilities. The original treatment process was installed with the following equipment:

- Construction of a Pump and Control Building with communications, bypass manual bar screen, two (2) horizontal grit channels, and three (3) primary pumps.
- Construction of two (2) preaeration tanks
- Construction of two (2) primary settling tanks
- Construction of two (2) anaerobic digesters with associated floating covers
- Construction of the Digester Building complete with Boiler, two (2) water to sludge heat exchangers, two (2) sludge recirculation pumps, and one (1) sludge transfer pump.

When required to meet new permit limitations the city completed a secondary treatment project in 1972 which included:

- Replacement of the communitor and replacement of the bypass manual bar screen with a mechanically cleaned chain and rake bar screen system
- Replacement of the three (3) primary pumps with four (4) new primary pumps
- Conversion of the preaeration tanks to an aerated grit tank
- Construction of the Grit Building
- Construction of two (2) additional primary settling tanks
- Construction of the Primary Sludge Building
- Construction of two (2) secondary treatment units with contact zones, reaeration zone, final clarifier, aerobic digestion zone, and return activated sludge (RAS) and waste activated sludge (WAS) air lift pumps.
- Construction of the Secondary Treatment Building with four (4) secondary pumps, five (5) centrifugal blowers, two (2) sludge concentrators and associated feed pumps, sludge load out facilities, one (1) standby power generator, and gaseous chlorine, polymer and coagulant feed facilities with associated chemical storage
- Construction of the chlorine contact tanks and associated water supply, froth spray, and sump pumps

In 1990 the city completed two (2) separate projects for the improvement of the solids handling and decholrination capabilities of the plant. The two projects scopes included the following:

- Construction of the dechlorination building
- Construction of the dechlorination chamber at the effluent end of the chlorine contact tanks
- Construction of the two (2) 50 foot diameter sludge holding tanks with floating covers and two (2) sludge recirculation pumps
- Rehabilitation of the two (2) existing 40 ft diameter anaerobic sludge digesters
- Construction of a new sludge load out station
- Construction of new Sludge Control Building
- Completion of Modifications to the existing digester building and secondary treatment building
- Removal of two (2) sludge concentrators and addition of a gravity belt thickener, two (2) sludge feed pumps, two (2) thickened sludge feed pumps, and a digester gas mixing system

Due to expected equipment lifespan and cost of maintenance of existing grit removal and aeration equipment the city completed an update to the facility in 2005. The scope of work for the project included the following:

- Demolition of existing grit removal equipment
- Construction of new screening building with two (2) new mechanically cleaned bar screens and two (2) washer-compactors
- Replacement of secondary unit aeration equipment, including blowers, aeration piping and the diffusers.

In order to limit further increasing operation and maintenance costs the city completed another improvement project in 2010 whose scope of work included:

- Replacement of primary pumps, piping, valves and associated equipment
- Installation of variable frequency drives (VFDs) for the primary and secondary pumps
- Construction of the septage receiving station, including building, wet wells, and truck scale
- Construction of new main electrical service, switchgear, and automatic transfer switch
- Improvements to the Supervisory Control And Data Acquisition (SCADA) System

The WWTP is currently rated for 5.0 MGD of average daily flow (ADF) and includes raw wastewater screening, primary pumping, aerated grit removal, primary sludge settling, secondary pumping, and contact stabilization of activated sludge, secondary clarification, chlorination, and dechlorination. Biosolids processing includes anaerobic digestion of primary sludge, aerobic digestion and gravity thickening of WAS, and sludge holding prior to disposal via land application. A process schematic of the existing plant as of 2019 can be located in Section VIII. A "Project Documents" of this report.

C. Condition of Existing Facility

The city's WWTP, while able to meet current permit limits on a consistant basis, is experiencing certain operational issues. Currently the plant is experiencing issues with their Anaerobic Digesters due to aging equipment that can no longer be properly maintained within reasonable cost to the WWTP. The current roofing system is in need of replacement, the digester roofing systems are experiencing issues with balance and vertical operation. These issues cannot be corrected within reason and it will be evaluated to perform a complete replacement of the existing digester roofing system.

The digester mixing system is another point of issues for the WWTP and proper operation. The current mixing system consists of an air lance system that provides air flow into the digester to promote mixing of the sludge within the digester. The current mixing system has been damage due to items within the digester and is not providing adequate air flow for mixing due to wear-down/fatiguing of parts in the air mixing system. With the current state of the mixing system it is not reasonable to repair and it should be evaluated to complete a full replacement.

The digester Heat exchanger is in need of replacement. While not having issues with operation in terms of flow restriction or heat transfer the WWTP Staff is no longer able to maintain the equipment. The digester heat exchangers were installed in 1952 with the original boiler and digester equipment. Due to the age it is near impossible to find parts or information for maintenance on the equipment.

Currently in the plant operation there is no active phosphorus removal technology in operation at the city's WWTP, only biological removal through the aeration and digestion process. In preparation for future permit limits the plant will need to consider active phosphorus removal technologies on top of their existing biological processes.

D. Financial Status of Any Existing Facilities

The majority of The City's customers have water meters. The rates are based on meter size, and usage regardless of customer type, as described on the city's wastewater utility online user rate tariff that is up for access by all existing and potential customers. The rate tariff can be found on the page below.
The City currently has 7,005 metered customers prior to the completion of the project and has proposed steady increases to the minimum fees and rate per 100 cubic feet. The proposed rate increases can be found on the rate tariff on the following page.

City of Mount Vernon - Wastewater Service Charges
Effective MARCH 1, 2021

			IN CITY	OUT OF CITY
	Wastewater Service Availability Charge			
	Meter Size	**Capacity Factor**	**Monthly Meter Charge**	**Monthly Meter Charge**
Monthly	*5/8"-3/4"*	1.00	$22.56	$31.58
	1"	1.35	$30.46	$42.64
	1½"	3.10	$69.94	$97.92
	2"	5.40	$121.82	$170.55
	3"	12.30	$277.49	$388.49
	4"	21.90	$494.06	$691.68
	6"	49.10	$1,107.70	$1,550.78
	8"	87.20	$1,967.23	$2,754.12

Notes: IN CITY
Usage computed as WWSAC charge for first 400 cubic feet and $5.64 per 100 cubic feet charged for all over 400 cubic feet.

In City flat rate connected without water access = $33.29

Notes: OUT OF CITY
Usage computed as WWSAC charge for first 400 cubic feet and $7.90 per 100 cubic feet charged for all over 400 cubic feet.

Out of City flat rate charge per unit is $46.61 (sewer connected, not metered)

Clinton Township charge is either minimum, metered or flat rate plus Clinton charge of $15.40
Services may also be billed by meter size minimums or by number of existing units.

City of Mount Vernon, 40 Public Square, Mount Vernon, Ohio 43050

City Council Ordinance 2020-39

25-Jan-21

The full version of the current Tariff for the City of Mount Vernon is located in Section VIII, 'Project Documents' of this report.

The City of Mount Vernons's median household income (MHI) is $42,668 with 19.0% of its residents living in poverty according to the 2018 American Community Survey.

As Detailed in The city of Mount Vernon's Expenses and Revenue Reports the City of Mount Vernon, Ohio currently has an outstanding system debt of $ 7,625,416.00 for their wastewater system. A breakdown of all existing debt services with age of maturity can be found in the table below.

Loan Provider	Yearly Debt Service ($ / Year)	Principal Remaining	Year of Maturity
OWDA	$403,201.00	$4,504,591.00	07-01-2032
GO Bonds*	$	$3,120,825.00	
	$	$	

**See attached City of Mount Vernon Debt Service Analysis – Wastewater Operations in Section VIII. A for additional detail.*

III. NEED FOR PROJECT

A. Health, Sanitation, and Security

The City of Mount Vernon currently provides wastewater collection and treatment services to the greater Mount Vernon area. If the WWTP were no longer able to provide proper service to its existing customers it would greatly affect the sanitation and environmental health in the Mount Vernon and Knox County service area.

The City of Mount Vernon's Existing Anaerobic Digester Mixers are currently no longer in operable condition. With the non-operation of the existing mixing system the primary sludge that is being treated is no longer properly being mixed and treated. Along with the mistreatment of the sanitary sludge with the existing mixer system, the improper mixing leads to requiring longer processing time which can lead to a backup for the sludge within the WWTP. If this were to occur the treatment process would be hindered and risk discharges to Kokosing River that exceed the allowable limits.

Currently the City's WWTP has not implemented a dedicated phosphorus treatment process. In order to preserve the surrounding area from excess phosphorus discharges to the river the plant will need to implement a dedicated nutrient (phosphorus) treatment process. Without the implementation of a nutrient removal process you risk the addition to excess phosphorus being introduced to the Kokosing River which could lead to detrimental biological growth within the river harming the local ecosystem.

B. Aging Infrastructure

The City of Mount Vernon's Wastewater Treatment Plant has been in operations continuously since 1952 with its initial construction of the anaerobic digestion process. Although temporary repairs have been completed the plant it is beginning to show signs of age and disrepair that cannot feasibly be repaired.

The anaerobic digesters have been in operation since 1952 with one modification or update to the digester basins in 1990. With the most recent modification to the existing digesters occurring over thirty (30) years ago the existing mixing and roofing systems present have reached the end of their useful life and are need of replacements in order to continue the proper operation of the digester basins. The replacement of the mixing system and the roofing system shall allow the city to properly supply mixing to the anaerobic sludge digestion process as well as contain all biogas and liquid contents within the basin with the proposed modifications.

The City's existing anaerobic digestion process heat exchangers have been in operation since 1952 with the initial construction of the WWTP. The heat exchangers that are installed have not been replaced or modify since they were installed leading to numerous issues for the WWTP staff. The heat exchangers are no longer manufactured at this time which leads to repairs to not be feasible nor possible. The internals of the heat exchanger while being cleaned periodically are becoming

corroded and wore out to the point of not allowing proper heat transfer to occur which affects both the energy usage by the heat exchanger and the plant but also affects normal operation of the digester process.

The City's currently does not have any reliable primary sludge inlet screening and digester effluent screening due to the age of the plants initial construction. Not having any method of screening prior to the digestion process can cause wear and tear to all of the plant process as well as allow for blockage of internal piping or mechanical parts. Addition of primary screening will allow for extended operation of both older and newer components of the WWTP as well as improve digester performance.

C. Reasonable Growth

The proposed project is to upgrade the existing Anaerobic Digestion Process, Primary Influent Treatment, Solid Handling & Dewatering, and the addition of Nutrient (phosphorus) Removal to The City of Mount Vernon's Wastewater Treatment Plant (WWTP). The City is expecting a 1% per year growth for the service area/customer base, however this would not be an impact to the planned project.

IV. ALTERNATIVES CONSIDERED

Improvements to six (6) main process equipment or processes present at the Mount Vernon WWTP. The areas of concern or areas in where modifications have been considered are outlined as the following:

A. Digester Influent Primary Sludge & Effluent Screening System Modifications
B. Anaerobic Digester roofing system
C. Anaerobic Digester Mixing System
D. Anaerobic Digester Heat Exchanger
E. Plant Wide Phosphorus Removal System
F. Solids Handling & Dewatering Equipment Modifications

All equipment mention in this section of the report was used for basis of design and is to be inferred as proposed for installation. Any equipment proposed to be used otherwise will have to be reviewed and approved by the engineer as equal to the basis of design.

A. Digester Influent Primary Sludge & Effluent Screening System Modification

1. Description

The City of Mount Vernon is proposing to introduce their current septic receiving station sludge into the existing digesters along with the primary sludge. In order to complete this properly the existing screening within the digester and plant would be insufficient. In order to eliminate rags and larger debris from reaching the existing digesters, primary sludge screening process will be needed to screen the primary sludge and sludge from the septage receiving station.

2. Alternatives Considered

1. Alternative #1- Installation of a New Primary Sludge Screen

Alternative #1 considers the introduction of a dedicated mechanical primary sludge screening system to the WWTP digester influent stream in an effort to remove excess trash and debris from the stream prior to introduction to the digester. This proposed screening system will capture both the existing digester primary sludge influent along with the screening of the septic hauling station sludge. Both streams currently are having excess trash and debris (rags, plastic bags, etc.) within them that create clogging issues or operational issues in the digesters existing screening systems and decanting processes. At the request of the WWTP operators this alternative will also replace the existing screens within the digesters in order to have redundancy for trash and debris screening within the digester allowing for finer trash and debris removal that may have passed the mechanical headworks screening system.

2. Alternative #2- Replacement of Existing Screening System

Alternative #2 evaluates the replacement of the existing stainless steel mesh supernatant screens within the two digester basins present at the WWTP. The current screens act as a final prior to

decanting of the digester basins. While they are operable the condition of the singular screens in each basin is poor and are no longer maintainable and would need to be replaced prior to continued operation. Currently due to the position of the screens within the digester basins the WWTP operators are experiencing issues in maintaining them, as well as, clogging issues. Due to the current issues that are being experienced at the plant along with the existing screens being located within the digester basin and unable to remove debris from the sludge prior to entering the digesters, this alternative has not been evaluated farther for viability of installation.

3. Alternative #3 – Do Nothing

The do nothing alternative is always considered however is not viable for this plant. The plant is currently experiencing large clogging events in their screening process and the existing internal digester screens are deteriorated. Due to this the Do Nothing Alternative is not viable and has not been considered in for this section of the plant.

3. Design Criteria

In order to allow the City of Mount Vernon to properly operate the existing digesters to treat the existing primary sludge and septage receiving station sludge properly the WWTP requires a primary sludge screening system. The design of the primary sludge screening solution needs to be sized for the maximum flow the plant can expect in order to ensure that the new or existing equipment isn't considered a bottleneck in the flow of the plant as that could create issues in operation of the plant (overflows, clogs, backups, etc.).

4. Project Planning Layout

Example layouts of the recommended alternative has been provided in "Project Documents – Primary Sludge Screening" section of this report.

5. Costs

All viable proposed Sludge Screening systems had quotes provided by Huber. Budgetary quotes for all required equipment can be found in the "Project Documents – Primary Sludge Screening" section of this report. A consolidated opinion of probable cost for the proposed sludge screening equipment, all required Piping, Valves and Miscellaneous equipment for the operation for each Alternative proposed in Section IV-A can be found at the end of "Project Documents – Primary Sludge Screening". A comparison of associated costs for all alternatives proposed in Section IV-A will be evaluated later in this report

B. Anaerobic Digester – Roofing System Improvements

1. Description

The existing Anaerobic Digesters were installed in 1952 with the construction of the WWTP, as noted previously the existing digesters roofing system had been replaced in 1992. Currently the WWTP is experiencing issues with the normal operation (balance, sealing and roofing stability) of the roofing system in such it needs to be corrected or replaced. In addition, with the evaluation of new digester mixing systems as part of this proposed upgrade project, it is essential that the selected roofing system be compatible with the proposed mixing system.

2. Alternatives Considered

a. Alternative #1- Repair & Rehabilitation of Existing Covers

The existing covers in place at the Mount Vernon WWTP as noted previously have been installed and in operation since 1992 and is showing extensive wear and deteration that occur from normal operation. At the time of writing this report proper rehabilitation of the existing covers would require at a minimum the following:

- New Pressure Release Valves
- New Anti-rotation Guides
- New Sampling Well Covers
- Replacement of all Gaskets and O-Rings
- Minor Steel Panel Replacements
- Blast and Paint Cover Exterior

Work to be completed was based on study and evaluation completed in 2017 by Evoqua, review of the existing construction plans and evaluation of the potential mixing system replacement which can be found in Section IV-C of this report. Please refer to "Project Documents – Roofing Systems" section for the existing conditions report and construction plans for the existing digester covers.

b. Alternative #2- New Steel Floating Cover with Gas Storage

Alternative #2 evaluates the replacement of the existing covers with new Steel floating covers for the anaerobic digesters. The city is proposing the installation of new steel floating covers in order to replace their existing steel covers. The floating steel cover is advantageous for operation of the existing digester basins due to not needing to modify the existing basin structure to hold the new roofing system as noted in "Project Documents – Roofing Systems". The floating steel cover due to the MOC and support structure will allow for the mounting of roof mounted mixing equipment and other miscellaneous equipment without major modifications being needed.

The primary disadvantage for a steel floating cover system for the anaerobic digesters is the limited gas storage capacity. This limited gas storage capacity is due to the floating cover having two set points which are pre-determined during the design and installation of the system. These two set points limit the gas holding capacity to a set maximum that is equal to the height of the anaerobic digester basin, which is much lower when compared to a system such as a membrane cover. With the maximum gas storage volume being set at the basin height the gas will have to be removed on a constant basis which in some cases could lead to having waste gas or energy that will need to be stored elsewhere on site until it can be utilized.

As the new cover proposed in alternative #2 would limit the overall gas storage the WWTP would need to implement modification to the existing Biogas removal piping to ensure that the new cover can:

- Remove excess Biogas within the digester
- Move along with the height variability of the floating steel covers.

A budgetary quote for the purchase and installation of the floating steel covers for the digester basin has been provided by Ovivo and has been included in appendix C of this report.

c. **Alternative #3 – New Membrane Gas Holding Cover**

Alternative #3 evaluates the use of a membrane gas holding cover for use on the WWTP anaerobic digesters. A Membrane gas holding cover would allow for the largest volume of biogas storage of all proposed alternatives as well as variability of storage volume within the anaerobic digester. However with the use of a membrane cover the WWTP would lose the ability of any roof mounted mixing systems as the membrane is not suitable for roof mounted mixing due to the material of construction, as well as, the loss of functionality in the membrane holding cover is any roof mounted system is installed. A membrane gas holding cover would also require significant modifications to occur to the current operation of the digester structues in order to mount and stabilized the membrane cover. Due to the cost, required modification and limitations to available mixing options Alternative #3 was considered not a viable option and not evaluated farther.

d. **Alternative #4 – Do Nothing**

The "Do Nothing" alternative for the existing conditions of the digester covers is always considered as an option, however with the existing operational conditions of the digester, the physical conditions of the cover and the proposed digester mixing system the "Do Nothing" alternative is not a viable option.

3. Design Criteria

In order to ensure proper design and operation of the proposed roofing system and proper operation of the digesters the new roofing system must meet the following criteria:

- Allow for the collection and degassing of the digester basins.

- Allow for varying digester sludge levels of operation
- Be compatible with wall and roof mounted mixing systems
- Reasonable operation and maintenance costs

The roofing system must meet the above requirements in order to allow for the WWTP to avoid any overall process changes in terms of the plant operation or maintenance costs.

4. Proposed Plant Modification

Example layouts of the recommended alternative (Alternative #2) has been provided in the "Project Documents – Roofing Systems" section of this report.

5. Costs

All viable proposed roofing systems had quotes provided by Ovivo. Budgetary quotes for all required equipment can be found in the "Project Documents – Roofing Systems" section of this report. A consolidated opinion of probable cost for the proposed roofing system, all required Piping, Valves and Miscellaneous equipment for the operation for each Alternative proposed in Section IV-B can be found at the end of "Project Documents – Roofing Systems". A comparison of associated costs for all alternatives proposed in Section IV-B will be evaluated later in this report.

C. Anaerobic Digester – Mixing System Modification

1. Description

The existing digester gas mixing systems located at the WWTP have been in operation since their installation in 1990. Based on current conditions of the gas mixing system piping and equipment it is in need of replacement. The Gas mixing system that was installed in 1990 is no longer able to be repaired properly and has not been in operation in recent years. The existing mixing lances are in need of repair or replacement if it is to operate properly. In addition, even during the time period in which the gas mixing system was operable, the mixing performance was poor resulting in "dead spots" throughout the digester basins. Exhibits of the existing conditions of the anaerobic digesters mixing system can be found in "Project Documents – Mixing Systems".

2. Alternatives Considered

a. Alternative #1- Air Lance (Gas) Mixing System

The gas mixing system has been utilized for many years in order to utilize the produced off gas from the digestion process in order to promote mixing of the sludge and system without creating the addition of extra gases or oxygen that could chemically modify the environment inside of the digester. Alternative #1 evaluates the replacement of the existing gas mixing system with a new up to date gas mixing system comprising of jetter mixing heads, distribution system and compression system. This equipment is most common and efficient on fixed roofing systems for anaerobic digesters, while still able to be used on floating roofing systems it is not suggested. Due to the limited application for roofing technology present in Section IV – A and input from the plant operators in the reliability of this system, as well as, prior poor mixing performance resulting in "dead zones" this system has not been evaluated farther.

b. Alternative #2- Wall or Roof Mounted Draft Tube Mixing System

Alternative #2 evaluates the use of a draft tube system in either the roofed mounted or wall mounted configuration. Both the wall and roof mounted draft tub mixing systems have their own benefits in terms of cost, installation and operation.

The wall mount configuration for draft tube mixing systems is mounted on the external wall of the anaerobic digester basin. This form of installation includes the pump motor and all associated valves and mounting equipment. The wall mounted configuration requires extra materials and construction effort in order to mount due to requiring external supports as well as clean digester basins to allow for proper installation. However the operation and maintained costs are lower than the roof mounted configuration as all parts are able to be isolated from the tank contents and are exterior to the tank therefore the plant can stay in operation during maintenance. Typical installation with suction and return tubing can be seen in Figure 1 below.

Figure 1: EIMIX Mechanical Sludge Mixer – Wall Mounted Configuration

The roof mounted configuration for the draft tube mixing system is mounted through the roof with the same equipment as the wall mounted however is mounted through the roofing system of the proposed anaerobic digester. The roof mounted configuration is suggested for static roofing systems as it does come in contact with the floor of the anaerobic digester in order to maximize the mixing of the tank. The roof mounted configuration does come with a cheaper installation and construction cost as there are no extra support or bracing required to utilize this mixing system when compared to the wall mounted configuration. However the maintain of the roof mounted system is more intensive due to all essential equipment being within the digester. A typical installation of the roof mounted configuration can be seen in Figure 2 below.

Figure 2: Ovio EIMIX Mechanical Sludge Mixer – Roof Mounted Configuration

The EIMix sludge mixing system either roof mounted or wall mount promote and even mixing distribution within the digester allowing for the even distribution of heating and sludge composition throughout the anaerobic digester. This alternative is a viable option for mixing in the wall or roof mounted configuration due to the ease of maintenance and limited modifications required in and of the proposed roofing systems.

c. Alternative #3 – Linear Motion Mixing System

Alternative #3 evaluates the use of a linear motion mixing system for the anaerobic digesters at the WWTP. A linear motion (LM) mixing system is a roof mounted system that would require minimal in basin components or in basin mounting as almost all of the system mechanical parts are posisition above the roofing system. The LM Mixer operates utilizing a single motor drive and then a gear box in order to propel the mixing head that sits within the tank as shown in figure 3 below.

Figure 3: Ovio LM Mixer – Roof Mounted

The LM Mixer hydrodisk varys between 6 ft and 8 ft in diameter and can provide mixing for a 300,000 gallon digester with a singular unit.

The LM Mixer promotes with its singular mixing disk a four (4) section mixing pattern, as shown in figure 4 below, that will allow for even mixing and distribution of heat throughout the anaerobic digester and allowing for the formation of a healthy sludge within the digester. With the formation of healthy sludge the digester can properly break down the remaining nutrients such as nitrogen through nitrification helping to eliminate any odor that would be expected during this process.

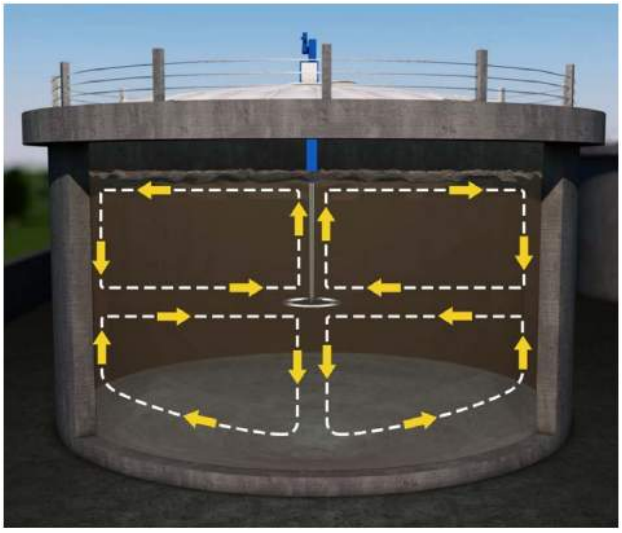


Figure 4: Standard Ovivo LM Mixer Flow Pattern

With the design of the LM Mixer shown in Figure 4 above it should be noted that all mechanical components of the LM mixer unit are located outside of the anaerobic digester basin. The removal of any in tank components allows for easy maintenance of the system and able to keep the digester basin in service for flow storage during maintenance of the unit. LM unit also limits the amount for mechanical parts that could fail utilizing their design which limits the O&M costs that could be experienced by the WWTP.

d. Alternative #4 – Do Nothing

The "Do Nothing" alternative for the existing conditions of the digester mixing system is always considered as an option, however with the existing operational conditions of the digester, the physical conditions of the mixing system and the current operational data from the existing mixing system the "Do Nothing" alternative is not a viable option.

3. Design Criteria

The Mixing system for the anaerobic digester is the Main component in promoting mixing and the development of healthy sludge within the anaerobic digester. In order to ensure that the mixer is designed properly for the WWTP the design criteria are as follows:

- The mixer must be sized to provide proper mixing for the existing Anaerobic Digester Basins.
- Limit in tank parts and maintained, allowing for continued operation time for the digester
- Maintain proper cycle time for mixing between anaerobic and aerobic mixing zones.
- Promote healthy sludge growth
- Biogas Production & Collection

Any Mixers that do not meet these design criteria will be noted as such and not evaluated past preliminary evaluation.

4. Proposed Plant Modification

Example layouts of the recommended alternative (Alternative #3) has been provided in the "Project Documents – Mixing Systems" of this report.

5. Costs

All viable proposed mixing systems had quotes provided by Ovivo. Budgetary quotes for all required equipment can be found in the "Project Documents – Mixing Systems" of this report. A consolidated opinion of probable cost for the proposed mixing equipment, all required Piping, Valves and Miscellaneous equipment for the operation for each Alternative proposed in Section IV-C can be found in the "Project Documents – Mixing Systems" section of this report. A

comparison of associated costs for all alternatives proposed in Section IV-C will be evaluated later in this report

D. Anaerobic Digester – Heat Exchangers

1. Description

The City of Mount Vernon is proposing the replacement of their existing anaerobic digesters heat exchangers. The City's existing digester heat exchangers were installed in 1952 with the initial construction of the anaerobic digestion treatment plant while the boiler utilized in this process was replaced in 2011. The existing heat exchangers are known as water to sludge heat exchangers in which they operate as a multiple pass shell in tube heat exchanger in order to maintain the sludge temperature at 96 to 98 °F + or – 3 °F. Figure 5 below shows a flow diagram of a typical water to sludge heat exchanger.

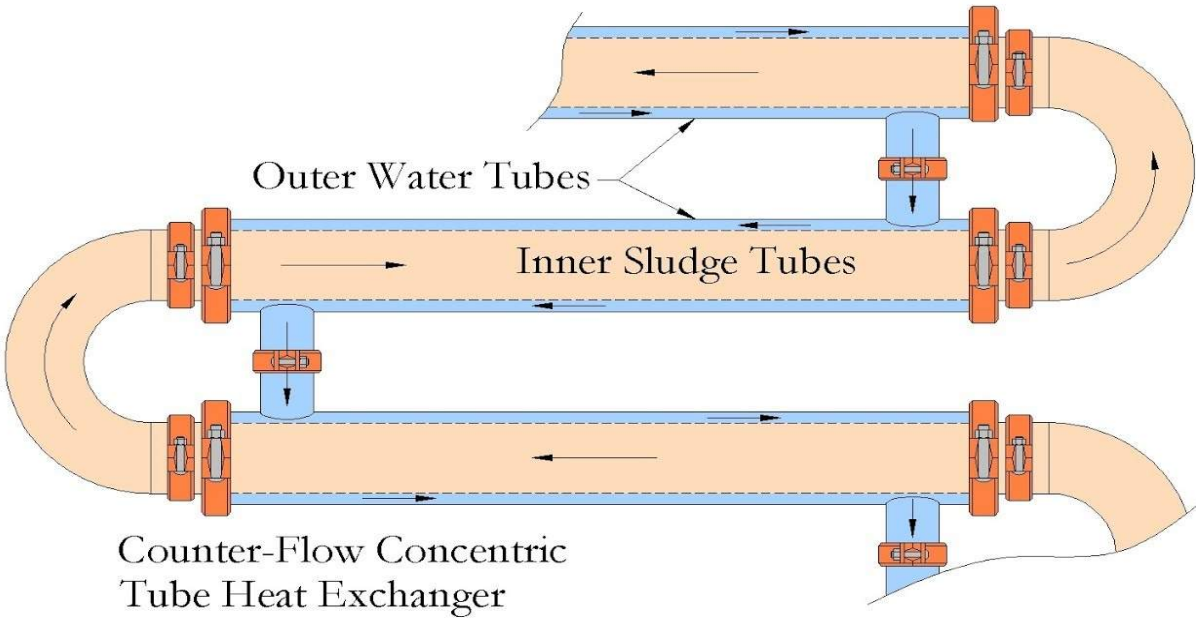


Figure 5: Typical Flow of a Water to Sludge Heat Exchanger

The use of the sludge heat exchanger is to promote the digestion process and biogas production within the anaerobic digesters. If the heat exchangers are not sized or are not operating properly it can hinder the digestion process leading to improper or no treatment of the sludge within the process.

2. Alternatives Considered

a. <u>Alternative #1- Addition of One (1) New Heat Exchnager</u>

Alternative #1 considers the addition of one (1) new heat exchanger while keeping the two (2) existing heat exchangers in operation. The new heat exchanger would be introduced in parallel to

the existing heat exchangers and would operate as the lead heat exchanger for the site operation after installation. The new heat exchanger would be sized with an assumed efficiency of 85% such that when fouling occurs in the future the heat exchanger can still operate properly. The proposed heat exchanger design information can be found in table 7 below for both a stainless steel and carbon steel option respectively. The cost of either configuration will be evaluated later in this report.

Table 7: Proposed Ovivo Water to Sludge Heat Exchanger Design Parameters

Water/Sludge Heat Exchanger	**Carbon Steel**	**304 SS**
Model	0.76 DDI	
Size	760,000 BTU/HR	
	SLUDGE	
Flow (GPM)	125	
Temperature In (°F)	95	
Temperature Out (°F)	106.7	
Pressure Drop (PSI)	8.5	8.7
Viscosity (CP)	4.0	
	WATER	
Flow	60	
Temperature in (°F)	155	
Temperature out (°F)	129	
Pressure Drop (PSI)	3.5	3.7
Viscosity (CP)	0.5	
PHYSICAL WEIGHTS & DIMENSIONS		
Heat Transfer Area (Ft^2)	159.5	175.5
Length (Approx.) (Ft)	6.46	6.96
Width (Approx.) (Ft)	3.74	
Height (Approx.)(Ft)	3.92	
Wall Thickness (in)	0.25	
Number of Layers	12	
Number of Channels (Per layer)	6	
Number of Nozzles	4	
Frame/Channel MOC	Mild Steel	
Approximate Weight (lbs)	6,100	7,100

The heat exchanger design shown in table 7 above is valid for all heat exchangers proposed to replace the existing heat exchangers in Alternative #1, #2, or #3 as it does meet required design criteria described in Section D-3 of this report.

b. Alternative #2- Replacement of Existing Heat Exchangers

Alternative #2 evaluates the replacement of both of the existing heat exchangers with new Ovivo water to sludge heat exchangers as shown in table #7 above in Section D-2-a of this report. The replacement of both existing heat exchangers with the proposed Ovivo water to sludge heat

exchangers will not be adding any new process equipment for the plant operations staff. The new heat exchangers will require new footers for mounting onto the existing floor. In order to ensure that all inlet and outlets for the heat exchanger are aligned properly and sized properly the inlet and outlet piping for both the water and sludge will be redone as part of this alternative.

c. Alternative #3 – Heat Exchanger Configuration Modification

Alternative #3 evaluates the replacement of both existing heat exchanger along with the addition of two (2) Sludge to Sludge heat exchangers. The addition of the Sludge to Sludge heat exchangers is to ensure that the sludge is being heated properly while also limiting the amount of heating duty that would be required to be done with the water to sludge heat exchanger and lowering the WWTP utility usage for heating. The addition of new sludge to sludge heat exchangers will require the addition of more 4" and 6" ductile iron piping and valves than in Alternative #2 in order to allow for flow to go through the new heat exchangers as well as give the operators the ability to take a sludge to sludge heat exchanger out of service for maintenance if needed. The proposed Water to sludge heat exchanger information is provided in Table 8 in Section D-2-a and the information for the Ovivo sludge to sludge heat exchanger is provided in table # below.

Table 8: Proposed Ovivo Sludge to Sludge Heat Exchanger Parameters

Sludge to Sludge Heat Exchanger	**Carbon Steel**
Model	0.267 DDI
Size	267,000 BTU/HR
COLD SLUDGE	
Flow (GPM)	150
Temperature In (°F)	70
Temperature Out (°F)	73.4
Pressure Drop (PSI)	19
Viscosity (CP)	
HOT SLUDGE	
Flow (GPM)	150
Temperature In (°F)	95
Temperature Out (°F)	91.5
Pressure Drop (PSI)	15
Viscosity (CP)	4.0
PHYSICAL WEIGHTS & DIMENSIONS	
Heat Transfer Area (Ft^2)	159.5
Length, Approx. (Ft)	6.00
Width, Approx. (Ft)	5.00
Height, Approx. (Ft)	4.20
Wall Thickness (In)	0.25
Number of Layers	12
Number of Channels per Layer	6
Number of Nozzles	4

Frame/Channel MOC	Mild Steel
Approx. Weight (Lbs)	8,000

The addition of a Sludge to Sludge heat exchanger would not be expected to increase the existing foot print of the heat exchangers as the sludge to sludge heat exchanger would be mounted above the new water to sludge heat exchangers.

d. Alternative #4 – Do Nothing

The do nothing alternative is always considered however is not viable for this plant. The existing heat exchangers are 68 years old and are no longer in production. Parts for repair or replacement of the existing heat exchangers is no longer viable as the parts are discontinued. The existing heat exchangers are also inefficient in heat transfer due to fouling and corrosion over time, causing the plant to have to use more energy for the required heating value. As such Alternative #3 has not been evaluated farther at this time.

3. Design Criteria

As the heat exchange process is the second largest promoter for the anaerobic digestion process any changes to the existing process must be completed such that the plant is able to stay in operation and meet the current demand being experienced by the plant. Any and all new proposed heat exchangers must meet the following design criteria:

Table 9: Design Criteria for Proposed Heat Exchangers

Parameter	**Sludge**	**Water**
Flow (GPM)	125	60
Temperature In (°F)	95.0	155
Min. Temperature out (°F)	96	115
Max Pressure Drop (PSI)	10	5
Viscosity (CP)	4.0	0.5

The proposed heat exchanger process must be designed as well to utilize the existing space designated for the heat exchangers to be located as to avoid any extra or unnecessary material costs for The City.

4. Project Planning Layout

General layouts have been provided for recommended alternative in order to get an associated cost for the proposed layout. Each layout can be found in beginning of the "Project Documents – Heat Exchangers" section of this report.

5. Costs

All new heat exchangers proposed were quoted from Ovivo as of February 8, 2021. The most recent budgetary estimate for all alternatives provided can be found in the "Project Documents – Heat Exchangers" section of this report. A consolidated opinion of probable cost for the heat exchangers, all required Piping, Valves and Miscellaneous equipment for their operation for each Alternative proposed in Section IV-D can be found at the end of the "Project Documents – Heat Exchangers" section of this report. A comparison of associated costs for all alternatives proposed in Section IV-D will be evaluated later in this report.

E. Nutrient Removal – Primary Influent & Sidestream Phosphorus CPR

1. Description

Currently the City of Mount Vernon's WWTP has no dedicated phosphorus removal process implemented. As noted in Section I of this report the currently influent and effluent phosphorus are as shown in table 10 below.

Table 10: City of Mount Vernon's, Phosphorus Loading Data (2018-2020)

Total Phosphorus (PO_4-P)	**2018**	**2019**	**2020**
Influent (mg/l)	3.32	3.21	2.92
Effluent (mg/l)	2.32	2.36	2.15
Expected 2025 Permit Limits (mg/l)	Less Than or Equal To 1		

In order to try and meet the predicted 2025 Permit limitations for phosphorus the Mount Vernon WWTP will need to implement a dedicated phosphorus removal system. Each of the alternatives proposed have been evaluated on a basis of cost, ease of use and efficiency.

2. Alternatives Considered

a. Alternative #1- Primary Influent – Chemical Phosphorus Removal

Alternative #1 evaluates the use of Chemical Phosphorus Removal (CPR) solely within the primary influent stream. The primary influent CPR process would include the introduction of a metal salt, in Mount Vernon's case Alum or Ferric, to the primary influent stream prior to the existing splitter for the four (4) primary settling tanks. The introduction or dosing of Alum into the primary effluent stream will allow for the influent stream to flocculate and then precipitate soluble phosphorus from the primary influent stream that can later be removed during the clarification process.

In order to implement this process and achieve the proposed future permit levels the dosing level of Alum into the primary effluent had to be tested and confirmed. As of 2017 Jar testing was completed by Strand Engineering in order to confirm the anticipated dosing rate that would be required to precipitate the existing phosphorus within the primary influent stream to below 1 mg/l. the desired dosing chemical, dosing information and daily usage rates can be found in the table below.

Table 11: Primary Influent CPR Dosing Requirements

Phosphorus Removal Chemical (PRC)	**Required Dosage (Gallon PRC/MG)**	**PRC Required @ ADF (GPD)**	**PRC Required @ PDF (GPD)**
Alum	202.3	572.5	1,011.5
Ferric	138.5	392.0	692.5

1. *ADF = Current Average Daily Flow = 3.0 MGD*

2. *PDF = Rated WWTP Peak Daily Flow = 5.0 MGD*
3. *PRC = Phosphorus Removal Chemical*

Based on required dosing rates from the jar testing Ferric is a more efficient phosphorus removal chemical (PRC) however alum dosing will be the suggested PRC due to ferric's effect on influent PH levels. Results from the jar testing noted that ferric had significant effects on PH levels even in low dosing rates, with most dosing rates resulting in PH less than 7 or even less than 6 which can affect both the phosphorus perception reaction as well as the normal biological process of the WWTP. In order to limit the reduction in PH and any excess process modification to counteract and major PH fluxations that could occur with the introduction of Ferric it is proposed for the WWTP to proceed with Alum dosing over ferric chloride. See the table below for sample of the testing results from Strand Engineering.

Table 12: Chemical Jar Testing Result – Primary Clarifier Influent

Phosphorus Removal Chemical (PRC)	**Jar**	**Dose (PPMV)**	**Total Phosphorus (mg/L)**	**Akalinity (mg/L as $CaCO_3$)**	**P.H (S.U)**
Alum	CPRT2J1	9	2.37		7.47
	CPRT2J2	60	1.96	238	7.26
	CPRT2J3	120	0.94		7.07
	CPRT2J4	240	0.59	182	6.80
Ferric Chloride	CPRT1J1	0	2.34		7.55
	CPRT1J2	60	0.94	224	7.15
	CPRT1J3	120	0.72		6.90
	CPRT1J4	240	0.59	134	6.55

In order to for the city to implement the modifications required for the introduction of alum dosing to the primary influent would entail minor modifications to the existing plant foot print. The city of Mount Vernon would be required to install at a minimum two (2) 17,200 gallon chemical storage tanks each 12ft in diameter, either double walled or in proper containment, along with dosing pumps and feed lines. The plant process modification could occur in previously utilized space that is no longer in use, limiting the amount of new space required for implementation.

b. Alternative #2- Biological Nutrient Removal (BNR) System

Alternative #2 evaluates the use of BNR in order to treat the phosphorus build up and influent phosphorus within the WWTP. BNR is the process of removing phosphorus in the system through an excess uptake into the activated sludge microbial population and wasting of the bio solids from the process. The difference in the BNR process and a typical activated sludge process is the sequencing of the anaerobic and aerobic conditions that promoted the formation of phosphorus accumulating organisms or PAOs.

The modification to the existing biological would entail the operation of the existing process treatment systems in a five stage nutrient removal operation. The five stage nutrient removal includes sludge return two (2) anoxic stages, two (2) aerobic stages and one (1) anaerobic stage

with a nitrate recycle through the first aerobic stage to the first anoxic stage. The two (2) aerobic stages allow for the excess uptake of phosphorus by the PAOs that were expressed during the initial anaerobic stage. The anoxic stage is required in order for the plant to handle any nitrate production that occurs during the uptake of the phosphorus during the aerobic stages.

The BNR system can be implemented at the plant with little modifications to the existing system or existing equipment. However plant process equipment and treatment modification will be required in order to allow for the proposed process flow diagram. Plant equipment modifications include items such as: Flow Recycles, Clarifier Basin Modifications for new zones, Electrical Updates/ Control Logic, and miscellaneous equipment and instrumentation. Due to the data provided from the original BNR Bench test from 2017 as well as the modifications to both the equipment and existing process at Mount Vernon, Alternative #2 BNR was not evaluated farther, as it would disturb the existing treatment conditions in such a way that other effluent limitations would require consideration for different treatment technology, making this alternative economically infeasible.

c. Alternative #3 – Side Stream Phosphorus Removal System

Alternative #3 evaluates the use of Chemical Phosphorus Removal (CPR) for the active treatment of phosphorus at the Mount Vernon WWTP. CPR utilizes metal salts to flocculate and precipitate the soluble phosphorus in wastewater. After the phosphorus is precipitated it is removed with a mechanical filtration system such as a cloth media filters or clarification. The CPR process is very simple in execution however the dosing rate for the metal salt will need to calculated and adjusted in order to ensure the proper dosing and the desired dropout rate for the phosphorus is acquired. Alternative #1 is only to evaluate a main flow stream for phosphorus and not any side stream phosphorus removal technology. All side stream removal technology will be evaluated with Alternative #3 (Section IV-E-2-c) of this report.

The proposed sidestream CPR system would operate within the normal treatment process flow and act as a tertiary or polishing step of the treatment process prior to dewatering. An example process flow diagram can be seen in figure 7 below.

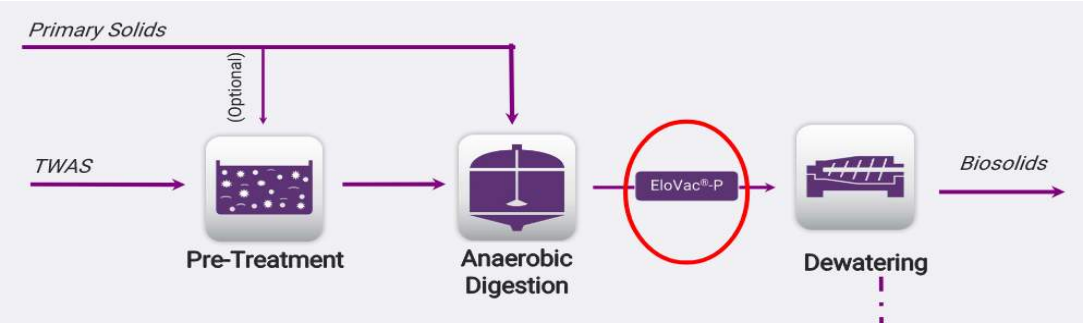


Figure 6: Example Process Flow Diagram for Anaerobic Digestion w/ CPR

The city is proposing implementing the CPR process utilizing Ovivo's EloVac-P system. The EloVac system operates by eliminating phosphorus by the formation of Magnesium-Ammonium-Phosphate or Struvite through the addition of a magnesium salt, typically magnesium chloride ($MgCl_2$). A typical flow diagram of the EloVac System can be seen in figure 8 below.

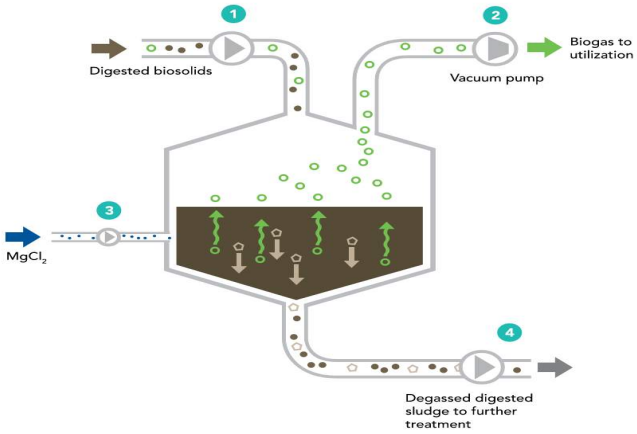


Figure 7: Typical Flow Diagram of Ovivo EloVac System

The proposed EloVac System for the city would be a maximum size of 6 ft X 18 ft X8 ft, which can be implement within the existing buildings present at the WWTP however it is suggested that a new fiberglass shelter on slab be constructed in order to house the EloVac system along with the required chemical dosing system, $MgCl_2$ Storage tanks and any miscellaneous piping, pumps of controls required for the EloVac system prior to any sludge handling and dewatering systems at the plant. The EloVac similar to any CPR process suggested would need secondary Bench testing prior to implementation at the WWTP in order to ensure proper operation and chemical dosing for Struvite precipitation with $MgCl_2$ Dosing.

d. Alternative #4 – Combination Primary Influent & Sidestream Removal

Alternative #4 evaluates the use of both Primary Influent CPR and sidestream CPR in order to treat/remove the phosphorus buildup within the WWTP. This alternative utilizes the EloVac system by Ovivo to treat the phosphorus off of the digester effluent, as well as, primary influent chemical dosing in order to promote phosphorus precipitation in the primary clarification zone to later be sent to the Digester and EloVac system. The EloVac (Sidestream CPR) proposed is the same equipment proposed in Alternative #3 with the estimated dimensions of 6 ft X 18 ft X 8 ft and equipment layout as shown in figure 11 on the page below.

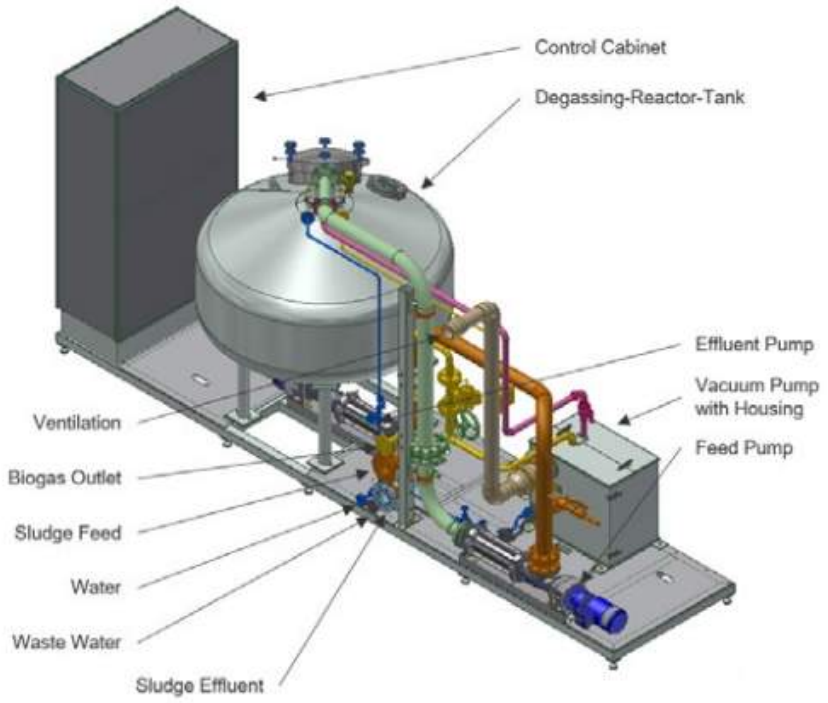


Figure 8: Typical Equipment Layout of the Ovivo EloVac System

The proposed primary influent dosing system would be installed as noted in Alternative #1 and would work in conjunction with the proposed sidesidestream CPR system. The installation of primary influent CPR would allow for the majority of the phosphorus being introduced to the system be precipitated out and remove with the bio solids after clarification. After sent from the clarifier to digestion the precipitated phosphorus would then be able to be removed in larger quantity by the sidestream CPR. Once remove by the side stream CPR the plant would no longer be recycling the phosphorus through the system and no longer be creating a build-up allowing for the plant to properly meet their limits. The proposed alternative #4 modification would take up little space as noted in previous sections and would successfully remove phosphorus from the primary influent and sidestreams within the plant allowing for future phosphorus limits to be met.

e. Alternative #5 – Do Nothing

The Do Nothing is always considered for any modification or upgrade project. While the phosphorus is currently not an issue for the WWTP, it will need to be addressed prior to the completion of this project. As such the "Do Nothing" alternative is not a valid alternative and has not been evaluated farther at this time.

3. Design Criteria

The design criteria for the phosphorus removal equipment to be installed at Mount Vernon's WWTP is as follows:

- Must not require Major Modification to existing plant process flow
- Most not Require Major Modifications to Plant foot print, such that the plant would be required to purchase more land
- The treatment process or combination of processes must be able to reliably treat the plant effluent to a meet predicted permit limits.
- Process must be viable for the production of Class B Sludge for land application

Any treatment process that does not meet the approve design criteria will be noted as such and the variation from design criteria will be taken into account for their evaluation later in this report.

4. Project Planning Layout

Example layouts of the recommended alternative (Alternative #4) has been provided in the "Project Documents – Phosphorus removal" section of this report.

5. Cost

All Phosphorus Removal Systems proposed were quoted from Ovivo. A budgetary proposal from Ovivo can be found in the "Project Documents – Phosphorus Removal" section of this report. A consolidated opinion of probable cost for the phosphorus removal equipment, all required Piping, Valves and Miscellaneous equipment for their operation for each Alternative proposed in Section IV-E can be found at the end of the "Project Documents – Phosphorus Removal" section of this report. A comparison of associated costs for all alternatives proposed in Section IV-E will be evaluated later in this report.

F. Solids Handling & Dewatering Equipment Modifications

1. Description

The existing solids handling equipment existing at the WWTP is not a permanent installation nor efficient for the plant. The existing solid handling equipment is a rental belt filter press and all waste is trucked out of the plant which leads to two unnecessary expenditures by the WWTP.

2. Alternatives Considered

a. Alternative #1- Installation of Solids Handling & Stabilization Equipment

Alternative #1 evaluates the introduction of a new belt filter press, polymer dosing, and lime dosing and bio-solid holding area to be located at the WWTP. The new Solids handling equipment will allow for the WWTP to produce and distribute Class B sludge which in turn would alleviate a portion of their current sludge hauling expenditures and any landfill disposal costs. Along with being able to produce Class B sludge the city will no longer be require to rent their belt filter press allowing to cut another expenditure that they are currently experiencing.

The downside of install a new Solids handling system is that they will require to construct a new building for chemical dosing, CPR and the belt filter press, as well as, rehabilitate or rebuild their sludge drying beds so that they may store and dry to sludge produced to meet the required dry content of Class B sludge.

b. Alternative #2 – Rent Equipment As Needed

Alternative #2 evaluates the continued operation of the WWTP utilizing rented solids handling equipment. The plant as mention previously is currently operating by renting their solids handling equipment. The rental of the solids handling equipment is an added operations cost that is unnecessary for the plant and can be reduced or removed. Therefore Alternative #2 is no longer valid and has not been evaluated farther.

c. Alternative #3 – Do Nothing

The "Do Nothing" alternative is always a consideration however this alternative is not viable for the current operation and finances of the WWTP. The plant is currently paying for the rental of the belt filter equipment and the removal of the solids from the plant leading to large and unnecessary expenditures for the WWTP. Therefore the "Do Nothing" Alternative is not valid for this project and has not been evaluated farther.

3. Design Criteria

The design criteria for any new solids handling equipment includes:

- Limit Site footprint for new equipment
- Store and Dry Produced Sludge
- Process daily sludge produced
- Meet Class B Sludge Classification for All Sludge Produced.

4. Project Planning Layout

Example layouts of the recommended alternative has been provided in the "Project Documents – Solids Handling" section of this report

5. Cost

All Solids handling and lime dosing equipment had been quote by their respective manufacture. Budgetary quotes for all required equipment can be found in the "Project Documents – Solids Handling" section of this report. A consolidated opinion of probable cost for the solids handling equipment, all required Piping, Valves and Miscellaneous equipment for the operation for each Alternative proposed in Section IV-F can be found at the end of the "Project Documents – Solids Handling" section of this report. A comparison of associated costs for all alternatives proposed in Section IV-F will be evaluated later in this report.

G. ENVIRONMENTAL IMPACTS

1. Air Quality

   The proposed project will not have any long term effect on air quality. Air quality may be minimally affected during construction due to the use of mechanical equipment. This affect will be regulated to a small area of a few feet adjacent to operating equipment during construction hours.

2. Water Quality

   Water quality will not be affected during the construction of this project. The proposed project will improve the water quality around the current discharge point in Kokosing River due to the installation of more effective wastewater treatment technology and Phosphorus Removal systems at the Wastewater treatment plant.

3. Noise

   There will be noise generated from equipment during the construction of the proposed project. The noise will be limited to construction working hours and should be low in decibels.

4. Wildlife and Endangered Species

   A project report and map were submitted to The National Heritage Program, Environmental Review Division, OH Department of Natural Resources, and to Ms. Patrice Ashfield a Field Supervisor with the U.S. Fish & Wildlife Service for review and comments pertaining to wildlife resources. A copy of the letters requesting review and comments has been included in the section VIII, “Project Documents”.

5. Wetland Effects

   This proposed project will be constructed primarily within the property of the Mount Vernon WWTP, or areas that have been previously disturbed and that have not been found to contain wetlands.

6. Unavoidable Adverse Impacts

   Construction of any water project has certain unavoidable adverse environmental impacts. These impacts are temporary and are listed as follows:

   a. The construction process will create dust, exhaust emissions, and noise from the necessary equipment used to build the project. These will be maintained at a minimal level.

b. Grassy, vegetated areas will be disturbed or replaced due to the construction of the Nutrient Removal and Solids Handling Equipment construction, as well as, general construction efforts..

In general, land disturbances will cause some soil erosion damage. This damage would be minimized by the implementation of an OEPA approved Erosion and Sediment Control Plan. WV Division of Environmental Protection approval for erosion and sediment control is by an OEPA NPDES storm water management permit, which would be obtained prior to bidding the project. Reclamation of disturbed areas and methods of soil stabilization would be included in the OEPA Erosion and Sediment Control Plan Approval. All measures pertaining to soil stabilization and erosion control would be designed by the engineer and enforced by the engineer and the OEPA during project construction.

7. Land Requirements

The proposed project will take place on the existing WWTP campus and no work exterior to the plant will take place. Thus no new land acquisition will be required for the completion of this project.

8. Potential Construction Problems

As all work for this project would take part within the process side of the WWTP the construction would need to happen in conjunction with keeping treatment capacity available within the plant. In order to complete this all work would need to occur in coordination with the WWTP staff to ensure continued operation.

9. Sustainability Considerations

a. Energy Efficiency

All proposed technologies or equipment in all alternatives will not add any power demand to the existing power demand. All proposed technologies will increase the energy efficiency at the WWTP.

V. SELECTION OF AN ALTERNATIVE

A. Digester Influent Primary Sludge & Effluent Screening Modifications

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #2 and the net present value of this alternative was found to be $664,089.07. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #2 can be found in the "Project Documents" section of this report.

2. Non-Monetary Factors

The existing screening system in place at the WWTP is able to remove any debris from the decant cycle of the anaerobic digesters it does not limit any debris from entering the digester allowing for that debris to enter into the digester and interrupt any process from functioning properly. It also creates issues for the plant staff in terms of maintenance as the existing screening system is inside of the digester basins. The implementation of an external primary sludge screen would eliminate the amount of large debris (Rags, Bags, Etc.) that would be able to enter into the digester basin leading to more efficient operation of the digester in terms of mixing and heating of the anaerobic sludge within. The maintenance on the sludge screeing system would also be easier as well as being able to bypass it allow for the plant to keep the digesters in operation during normal maintenance events.

The inclusion of replacement screen for the existing screens in place at the WWTP would give the plant a secondary screening method as a safety measure for any debris that is not captured by the initial headworks system, leading to a cleaner decant coming off of the digester.

B. Anaerobic Digester – Roofing system Improvements

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #2 and the net present value of this alternative was found to be $1,076,731.53. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #2 can be found in the "Project Documents – Roofing Systems" section of this report.

2. Non-Monetary Factors

While the existing roofing system can be repaired it is unknown if it will still be sound in unrepaired areas to hold any new loads on the top of the cover. The existing cover is also not under any warranty at this point in time and all repairs required for the lid will need to be completed with City funds.

As noted previously the use of a membrane roofing system would limit the options of digester mixing systems available for use on the existing digester basins as all roof mounted systems would no longer be viable. Along with the limitation to mixing systems a membrane roofing system would need major modifications to be completed to the digester basin in order to mount and hold the membrane cover in place on the basin.

The use of a new Steel cover would be the most advantageous in this situation as it would not require the installation of a new mounting system only the replacement of the existing limiting any damage that may occur to the existing digester basin concrete. The WWTP staff is also familiar with the operation and maintenance expected with a floating steel cover system which would allow for an easier transition after the project has been completed.

C. Anaerobic Digester – Mixing System Modifications

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #2 & 3 and the net present value of these alternatives were found to be $1,908,408.77 and $1,153,731.53 respectively. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #2 & 3 can be found in the "Project Documents – Mixing Systems" section of this report.

2. Non-Monetary Factors

The existing Mixing system as noted previously and shown in Appendix D is no longer operable or in a state that would be able to be repaired. The gas mixing system that is currently installed is currently not in operation and due to extensive in basin damage is not properly supplying mixing to the digester basin when it is in operation.

The Wall mounted EIMIX system while removing all mixing elements from outside of the digester basin allowing for ease of maintenance on the process equipment by the WWTP staff. The installation would create a major modification to the supporting wall and existing structure of the digester basin. The installation of the wall mounted system would require the penetration in multiple spots of the existing digester basins which could lead to unexpected damage of the basin. The EIMIX system proposed also would require a large space outside of the digester basin than is currently available at the WWTP.

The roof mounted EIMIX system would be able to be installed within the existing or proposed roofing system. However with the current and proposed operation of the digester roofing system it would not have a stable base at the base of the digester basin as required for the operation of the roof mounted configuration. The roof mounted system would require the roofing system to no longer provide variable gas storage in the digester basin and be anchored to the base of the basins. Along with the limitations of the roofing system that are viable for the roof mounted configuration a majority of the mixing equipment that would require normal maintenance by plant staff would be within the digester basin, requiring the basin to be cleaned and taken out of service by the WWTP for Maintenance to be completed.

The roof mounted LM mixer would not limit the available roofing system of the digester as it does not require a base installation within the digester. The LM mixer would also not require the digester basin to be removed from operation for normal maintenance of the system as all main mechanical parts can be accessed for the roofing system. The Lm mixer will require a major modification to the existing concrete supports within in the basin as they would hinder the operation of the mixer however no penetration to the existing concrete would need to occur, minimizing any unintended damage or cracking to occur to the digester basin for the installation of the LM basin.

D. Anaerobic Digester – Heat Exchanger Modifications

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #2 & 3 and the net present value of these alternatives were found to be $752,325.80 and $1,329,488.70 respectively. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #2 & 3 can be found in the "Project Documents" section of this report.

2. Non-Monetary Factors

The existing heat exchangers in operation at the WWTP are no longer in production nor are their replacements parts being made at this time. In order to ensure proper operation at the WWTP and ease of maintenance the WWTP the Heat exchangers should be replace.

Although point of note is that any damage internal to the existing heat exchanger such as pitting or fouling of the internal piping is unknown but expected to have occurred within the existing heat exchangers. These types of damages limits the functionality of the heat exchangers making the inefficient and possibly not function to the design specifications.

E. Nutrient Removal – Primary Influent & Sidestream CPR

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #4 and the net present value of this alternative was found to be $12,674,777.04 respectively. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #4 can be found in the "Project Documents" section of this report.

2. Non-Monetary Factors

The plant currently does not have a phosphorus effluent limitation it is expected that they will be receiving one in future iterations of their NPDES permit. As such the implementations of a phosphorus removal system at this point in time would allow for the WWTP to monitor and modify

the operation as needed in order to ensure proper operation of the WWTP with Phosphorus removal while meeting all existing and proposed effluent limitations.

F. Solids Handling & Dewatering Equipment Modifications

1. Life Cycle Cost Analysis

A Life Cycle Cost Analysis was performed for Alternative #1 and the net present value of this alternative was found to be $3,263,488.70. The Life Cycle Cost Analysis calculated using Net Present Value for Alternative #1 can be found in the "Project Documents" section of this report.

2. Non-Monetary Factors

Currently the WWTP does not own the Solids Handling equipment that is in operation on site. The WWTP is relying on liquid holding tanks and a signal contractor to remove sludge from the site. At times during the current operation of the WWTP there are times in which they are near max for sludge holding capacity due to waiting on the contractor to have availability to remove the excess sludge. The implementation of their own solids handling equipment would allow for the City to provide the area with Class B Sludge which would create a credit for the WWTP and a service to the surrounding community. This improvement would also provide a new storage method for the WWTP for Solid sludge opening which will give them more room for operation even in events where there is no availability for class B sludge.

VI. PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

A. Preliminary Project Design

The City of Mount Vernon is proposing the inclusion of both a headworks system as well as the existing stainless steel screening system that is currently in place at the WWTP. The inclusion of a new headworks screen to remove large debris from the digester basin will allow for better operation of the existing digester process in terms of mixing and heating of the sludge within the basin. By keeping the existing screens inside the basin the WWTP will also ave a final or secondary screening system in place for the decant stream being removed for the anaerobic digesters ensure that the removed stream will provide a clean effluent free of debris. The inclusion of the both the new headworks and existing screen will allow for the WWTP operators to maintain either the screen or headwork at any given time without concern for a pass through of debris through the system leading to more uninterrupted uptime of the plant.

The City is also proposing to replace their existing anaerobic digester floating roof with a new steel floating roof system. The replacement of the roofing system will improve the operation of the roofing system of the anaerobic digesters that are currently in place at the WWTP. The replacement of the roofing system with a new steel roofing system will also allow for roofing mounting of any necessary equipment for operation of the anaerobic digester such as gas piping or mixing systems.

The City is also proposing the replacement of their existing gas mixing system with a linear Motion (LM) mixer provided by Ovivo. The replacement of the mixing system will allow for operation of the anaerobic digesters with efficient mixing of the digester basins with the four (4) mixing sections as shown in figure ## in Section IV-C. The implementation of the LM mixer by Ovivo will also reduce the current energy consumption at the plant for the mixing system operation as the power required by the LM mixer comparative to the existing Gas Mixing system is considerably lower. The LM mixer O&M costs are also considerably lower than the existing mixing system taking into account required digester down time for maintenance of the LM mixing system as well as the amount of parts required for the operation of the LM mixing system in comparison to the existing gas mixing system.

The City is proposing the replacement of their existing anaerobic digester heat exchangers with new Ovivo water to sludge heat exchangers. The replacement of the existing heat exchangers is required in order to ensure proper heating of the anaerobic digestion process. The new proposed heat exchanger will be sized to properly handle the existing flow and the max design flow for the existing plant equipment and can be updated if needed with a sludge to sludge heat exchanger in series with the water to sludge heat exchangers.

The City is proposing the installation of new chemical phosphorus removal technologies on the primary influent and digester sidestream process streams. The installation of the new technology will be instrumental in order to meet future NPDES permit limits on phosphorus. The new CPR technology may in the future be supplemented with biological nutrient removal in order to treat

both phosphorus and nitrogen, however at this time due to cost, space limitations and results from past jar testing the application of BNR along with the CPR technology will not be implemented.

The city will also be proposing a dedicated solids handling and dewatering process within the plant in order to handle all sludge within the existing digesters at a reduced or non-existant cost to the WWTP. The new solids handling equipment will be placed at within in the plant outside of normal operation areas to allow for sludge storage, sludge drying and processing areas without affecting normal flow of traffic or existing operational processes in place at the plant. The city will also be planning on utilizing the phosphorus removed from the normal treatment process due to the addition of the CPR process in order to produce a Class B sludge that can be used in land application.

B. Project Schedule

Professional Services Acquired	February 2021
All Agreements Executed & Approved	March 2021
Submission of OEPA Application	July 2021
OEPA Review and Approval	July 2021
Begin Design	August 2021
Design 50% Complete	September 2021
Submit Plans and Specifications to OH Health Department	October 2021
Submit Plans and Specifications	November 2021
Request for all Binding Commitments	December 2021
All Permits and Clearances Obtained	December 2021
Request Authorization to Bid	January 2022
Advertise for Bids	January 2022
Open Bids	February 2022
Loan Closing/Award Project	February 2022
Start Construction	April 2022
Project Completion	July 2022

C. Permit Requirements

1. Ohio Environmental Protection Agency. OH NPDES permit for storm water management and erosion and sediment control. Apply for with final plans.
2. OH Department of Health and Human Resources. Apply for with final plans.
3. OH Division of Highways. Apply for with final plans, if required.
4. OH Division of Natural Resources, Office of Land and Streams. Apply for with final plans, if required.
5. Army Corps of Engineers, Construction Notification. Apply for with final plans.

D. Sustainability Considerations

1. Energy Efficiency

The Proposed WWTP upgrades & improvements currently pose no increases in the overall electrical efficiency of the Mount Vernon WWTP. All improvements are to parts of the plant that are old or aging are currently not operating efficiently and are likely experiencing a higher energy consumption than they were originally designed to require.

E. Total Project Cost Estimate (Engineer's Opinion of Probable Cost)

The total proposed cost of construction for this project with 10% construction contingency is $6,679,000.00. The total estimated project cost is $8,122,750.00. The project is proposed to be funded with a $7,122,750.00 WPCLF loan and a $1,000,000.00 Grant from USACE Section 594 Funds.

VII. CONCLUSIONS AND RECOMMENDATIONS

The City of Mount Vernon (The City) owns and operates a wastewater treatment plant (WWTP) that is currently discharging to the Kokosing River.

The City is proposing a project to upgrade and repair their existing wastewater treatment plant. The upgrade to the existing wastewater treatment plant will include the replacement of their existing anaerobic digester roofing systems, mixing systems and heat exchangers for both of the anaerobic digester basins. The project will also include the addition of a dediciation headworks system prior to the anaerobic digester basins.

The City is also proposing the addition of a dedicated nutrient removal process with the additions of digester supernatant treatment utilizing the EloVac system by Ovivo to combat the Phosphorus build up and recycling in the plant and primary influent chemical dosing with Alum to promote phosphorus precipitation prior to primary clarification. The City will also be adding a dedicated solids handling and storage process that will be fully owned and operated by the city.

All of the project construction is set to occur within the existing property of the City's WWTP. Environmental clearance letter will be sent out to the OEPA, Ohio Department of Natural Resources and the US Fish and Wildlife service prior to any construction occurring for this project. As this project is occurring in private and previously disturbed land it is not expected to impact and wildlife, historical resources or environmental resources.

Construction of any wastewater project has certain unavoidable adverse environmental impacts. These impacts are temporary and improvements to the existing system will create minor soil erosion during the construction period and would be minimized by the implementation of a OEPA approved Erosion and Sediment Control Plan. Dust creation, exhaust emissions, noise, and odor produced by the necessary equipment used to build the project will be mitigated by only constructing during normal daylight hours.

The total proposed cost of construction for this project with a 10% construction contingency is $6,679,000. The total estimated project cost is $8,122,750.00. The project is proposed to be funded with a $7,122,750.00 WPCLF loan and a $1,000,000.00 Grant from USACE Section 594 Funds.

VIII. PROJECT DOCUMENTS

A. Background Information

1. Engineering Procurement Information
2. 2020 Citywide Revenue & Expense Report
3. 2020 Wastewater Billing Information
4. Government Ordinance (GO) Bonds Payment Schedule
5. Existing Process Diagram
6. 2020 NPDES Permit

B. Regulatory Agency Correspondence

1. ODNR Correspondence
2. U.S. Fish & Wildlife Correspondence
3. USACE – Huntington District Correspondence

C. Primary Sludge & Digester Effluent Screening Information

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

D. Roofing Systems

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

E. Mixing Systems

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

F. Heat Exchangers

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

G. Phosphorus Removal

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

H. Solids Handling

1. Opinion of Probable Cost With NPV
2. Modification Layout
3. Manufactures Product Information

I. Proposed Plant Modification & Opinion of Probable Cost

BACKGROUND INFORMATION

May 19, 2020

Mr. Brian W. Ball, P.E.
City Engineer
City of Mount Vernon
40 Public Square
Mount Vernon, Ohio 43050

Dear Mr. Ball:

Subject: Proposal for Professional Services
Wastewater Treatment Plant Anaerobic Digester Improvements
City of Mount Vernon, Knox County, Ohio
CEC Project 302-609

Civil & Environmental Consultants, Inc. (CEC) is pleased to present our proposal to provide professional civil engineering services related to the City of Mount Vernon's existing Wastewater Treatment Plant - Anaerobic Digester System, located in the City of Mount Vernon, Knox County, Ohio.

1.0 PROJECT DESCRIPTION

CEC understands that the City of Mount Vernon (City) is having performance and operational issues with its two (2) anaerobic digesters located at their existing 5 MGD Wastewater Treatment Plant (WWTP). The current gas mixing system used for the digesters is not maintaining/sustaining the digestion process and one of the digester screens has been damaged. The City is needing options/alternatives to make the necessary improvements to the WWTP's digestion process.

2.0 PURPOSE

The purpose of this proposal is to provide professional civil engineering services for the needed improvements to the WWTP anaerobic digesters. Anaerobic Digestion is highly dependent upon effective sludge mixing and so far CEC has evaluated five (5) different options for anaerobic digester mixing technology to best serve the WWTP. This proposal will provide for the completion of the evaluation and complete a design for the selected improvements.

3.0 SCOPE OF SERVICES

This proposal for professional services is based on CECs current involvement and understanding of the current status of the anaerobic digesters at the WWTP and CECs past experience on similar projects. The following information forms the basis for our scope of services:

(1) CEC will complete an evaluation of (5) five different mixing technologies to determine which digester mixing system will work best for the City. The five (5) options being considered are a LM (linear motion) Mixer, EIMIX Mechanical Mixing Draft Tube Systems (external draft tube and roof-mounted), JVD Turbomixer and Nozzle Mix Systems.

(2) CEC will complete an evaluation to determine the best performing and most feasible option for sludge screening.

(3) CEC will provide the City with the information from the evaluations so that the City can select the best alternatives. Once a direction is given by the City, CEC can move into a final design and the preparation of construction plans.

(4) CEC will prepare construction documents for the proposed improvements to the anaerobic digester mixing system and sludge screening system in AutoCAD format, conforming to the City, State, & Federal regulations.

(5) CEC will submit the construction documents as applicable to the prescribed agencies of the City. CECs estimated costs for civil engineering services include making revisions to drawings to address comments by the City during the design phase and to address a maximum of two (2) rounds of review comments, which is the typical number of submittals required for these plans. Addressing additional review comments will require a contract change order.

CEC has prepared a scope of services for each of the major project components, divided into four (4) tasks. It should be understood that our scope of services are the base services anticipated by CEC. This scope of services and associated costs may require revision as the project progresses.

OWY BWB 5-27-2020

Task 1. Preliminary Design and Field Investigations
Task 2. Engineering Final Design
Task 3. Bidding Services
Task 4. Engineering During Construction

Task 1. Preliminary Design and Field Investigations

CEC will make site visits to the WWTP with representatives of the equipment manufacturers to review and evaluate the existing site conditions to ensure proper design. A review of the current system including equipment, piping, electrical, and control system will need to be reviewed. CEC will then reevaluate the proposed options to modify the preliminary cost estimates to include necessary changes. CEC will then prepare a Life Cycle Cost analysis based on the life expectancy of the equipment and operation and maintenance required. CEC will then prepare a memo to present to the City the revised options already provided, detailing out the pros and cons of each option along with the Life Cycle Cost. CEC will provide a recommendation to the City on the most feasible option. CEC will proceed into the Final Design of the project once the City has made a decision on which option they want to use for the project.

Task 2. Engineering Final Design

CEC will prepare construction plans and technical specifications based on the selected digester improvements. CEC will perform the necessary field survey, 3-D scanning, field engineering, and review of Owner provided record drawings to create a detailed site plan to serve as the foundation for the production of construction plans for the proposed Anaerobic Digester Upgrades. CEC will submit draft plans and meet with City Staff at two (2) completion milestones of 50% and 100% to review the plans with the City Staff and address comments concerning the proposed improvements, construction plans, and technical specifications. The construction plans and specifications will provide the materials and quantities required for bidding. CEC will prepare an Engineer's Opinion of Probable Construction Cost at the 100% complete milestone based on the final quantities of work proposed. CEC will provide the City the final construction plans in AutoCAD and electronic PDF format as well as an electronic copy of the technical specifications.

At this time, it is not anticipated that an Ohio Administrative Code 3745-42 Permit to Install (PTI) will be required. If a PTI or any other permit is required, CEC can provide a scope and cost to complete the permit(s).

Task 3. Bidding Services

CEC will assist the City in advertising and obtaining bids for the project, CEC will attend a Pre-Bid Meeting to discuss technical aspects of the project. CEC will prepare and issue Addenda as appropriate to answer questions, clarify, correct, or change the issued documents based on questions from contactors.

Task 4. Engineering During Construction

CEC will attend and assist the City with conducting a pre-construction meeting prior to construction work starting. CEC will receive, review, and determine the acceptability that the Contractor is required to submit to the Engineer, including the progress schedule, schedule of submittals, and schedule of values. Additionally, CEC will make six (6) visits to the site during construction, review/approve pay applications, and submit monthly progress reports. CEC shall prepare final As-Built/Record drawings based on information provided by Contactor, and City. CEC will provide owner with two (2) copies of As-Built/Record drawings and operation manuals. In addition, PDF copies will be provided.

4.0 INVOICING AND PROJECT COSTS

CEC proposes to complete the above outlined scope of services on a lump sum basis for the fees below. Invoicing for additional professional services will be in accordance with the 2020 Columbus Civil and Survey Category Rate Table. Subcontracted services will be invoiced at cost plus a 12% administrative fee.

Based on our understanding of the project and the proposed services, the fees to complete these services, on a task by task basis, are listed below.

Task 1	Preliminary Design and Field Investigations	$ 20,000
Task 2	Engineering Final Design	$ 50,000
Task 3	Bidding Services	$ 3,000
Task 4	Engineering During Construction	$ 40,000
	ESTIMATED TOTAL	**$ 113,000**

Invoicing will be done monthly and tasks will be billed on a percent complete basis. All reimbursables are included in the lump sum costs provided.

5.0 TERMS AND CONDITIONS

The City's Standard of Terms and Conditions, which apply to the proposed work, is attached. Changes to the Terms and Conditions must be agreed to in writing by both parties prior to authorization to proceed.

6.0 SCHEDULE

CEC is staffed with experienced civil engineers and will initiate work on this project upon your authorization to proceed. CEC will work with the City to meet their Schedule and Major Milestones.

7.0 CLOSING

CEC appreciates the opportunity to provide you with this scope of services to assist you with this project. Please contact Travis Adams at 304-848-7163 or Matthew Fluharty at 304-848-7155 should you have any questions.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Travis Adams
Sr. Project Manager

Matthew Fluharty, PE
Principal

5/27/20

Enclosures: 2020 Rate Schedule
Schedule of Terms & Conditions

2020 COLUMBUS CIVIL & SURVEY CATEGORY RATE SCHEDULE

Title	Rate
Vice-President	$211.00
Principal	$196.00
Project Manager-Senior	$180.00
Survey Crew-2-Man	$176.00
Project Manager III	$165.00
Project Land Surveyor	$144.00
Project Manager II	$139.00
CADD Manager	$139.00
Project Manager I	$124.00
Survey Crew-1-Man	$118.00
Assistant Project Manager	$113.00
Senior Construction Technician	$108.00
Project Consultant	$101.00
Project Engineer	$101.00
Project Landscape Consultant	$101.00
Staff Consultant	$91.00
Project Scientist	$82.00
Survey Technician	$77.00
Archaeological Field Supervisor	$77.00
Field Technician	$77.00
GIS Specialist	$77.00
Administrative	$72.00
Staff Scientist	$67.00
CADD Technician	$67.00

2020 RATE SCHEDULE

SCHEDULE OF TERMS AND CONDITIONS

City of Mount Vernon
STANDARD TERMS & CONDITIONS

The following conditions and provisions define the basic terms relating to the services and compensation agreed to and as outlined on the attached Letter Agreement and/or Work Authorization.

Agreement Date: MAY 19, 2020

Owner: City of Mount Vernon, Ohio
Owner's Signature:

~~Joel Daniels~~ Safety Service Director Richard S. Dzik

Date: 5/27/20

Engineer: _____
Engineer's Signature:

_____

Date: _____

I hereby certify that funds in the amount in the amount of $ 73,000.00 have been lawfully appropriated for the purpose of meeting the obligations of this Contract and are in the Treasury or are in the process of collection to the credit of the appropriate fund, free from prior encumbrance. Only for Tasks 1 - 3 of proposal.

Maximum certification for this contract shall be $ 73,000.00.

Terry Scott, City Auditor

Terry Scott, City Auditor

Date 28 May 2020.

ARTICLE 1 - SERVICES OF ENGINEER

1.01 Scope

A. ENGINEER shall provide all Services set forth herein and upon this Agreement becoming effective, ENGINEER is authorized to begin unless otherwise stipulated to by the OWNER.

ARTICLE 2 - TIMES FOR RENDERING SERVICES

2.01 General

A. ENGINEER's services and compensation under this Agreement have been agreed to in anticipation of the orderly and continuous progress of the Project through completion as outlined in the **May 19, 2020** Fee Proposal letter to Brian Ball, City Engineer. Unless specific periods of time or specific dates for providing services are specified in this Agreement, ENGINEER's obligation to render services hereunder will be for a period which may reasonably be required for the completion of said services.

B. If in this Agreement specific periods of time for rendering services are set forth or specific dates by which services are to be completed are provided, and if such periods of time or dates are changed through no fault of ENGINEER, the rates and amounts of compensation provided for herein shall be subject to equitable adjustment. If OWNER has requested changes in the scope, extent, or character of the Project, the time of performance of ENGINEER's services shall be adjusted equitably.

C. For purposes of this Agreement the term "day" means a calendar day of 24 hours.

2.02 Suspension

A. If OWNER fails to give prompt written authorization to proceed with any phase of services after completion of the immediately preceding phase, or if ENGINEER's services are delayed through no fault of ENGINEER, ENGINEER may, after giving seven days written notice to OWNER, suspend services under this Agreement.

B. If ENGINEER's services are delayed or suspended in whole or in part by OWNER, or if ENGINEER's services are extended by Contractor's actions or inactions for more than 90 days through no fault of ENGINEER, ENGINEER shall be entitled to equitable adjustment of rates and amounts of compensation provided for elsewhere in this Agreement to reflect, reasonable costs incurred by ENGINEER in connection with, among other things, such delay or suspension and reactivation and the fact that the time for performance under this Agreement has been revised.

ARTICLE 3 - PAYMENTS TO ENGINEER

3.01 Methods of Payment for Services and Reimbursable Expenses of ENGINEER

A. *Preparation of Invoices.* Invoices will be prepared in accordance with ENGINEER's standard invoicing practices and will be submitted monthly to OWNER by ENGINEER, unless otherwise agreed. The amount billed in each invoice will be calculated as set forth in the Agreement including additional services and reimbursable costs, if any.

B. *Payment of Invoices.* Invoices are due and payable within 30 days of receipt of an acceptable invoice. In addition, ENGINEER may, after giving seven days written notice to OWNER, suspend services under this Agreement until ENGINEER has been paid in full all amounts due for services, expenses, and other related charges.

C. *Disputed Invoices.* In the event of a disputed or contested invoice, only that portion so contested may be withheld from payment, and the undisputed portion will be paid.

D. *Payments Upon Termination.*

1. In the event of any termination, ENGINEER will be entitled to invoice OWNER and will be paid for all services performed or furnished and all Reimbursable Expenses incurred through the effective date of termination.

2. This paragraph intentionally left blank.

ARTICLE 4 - OPINIONS OF COST

4.01 Opinions of Probable Construction Cost

A. ENGINEER's opinions of probable Construction Cost provided for herein are to be made on the basis of ENGINEER's experience and qualifications and represent ENGINEER's best judgment as an experienced and qualified professional generally familiar with the industry. However, since ENGINEER has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, ENGINEER cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by ENGINEER. If OWNER wishes greater assurance as to probable Construction Cost, OWNER shall employ an independent cost estimator.

ARTICLE 5 - GENERAL CONSIDERATIONS

5.01 Standards of Performance

A. The standard of care for all professional engineering and related services performed or furnished by ENGINEER under this Agreement will be the care and skill ordinarily used by members of ENGINEER's profession practicing under similar circumstances at the same time and in the same locality. ENGINEER makes no warranties, express or implied, under this Agreement or otherwise, in connection with ENGINEER's services.

B. ENGINEER shall be responsible for the technical accuracy of its services and documents resulting therefrom, and OWNER shall not be responsible for discovering deficiencies therein. ENGINEER shall correct such deficiencies without additional compensation except to the extent such action is directly attributable to deficiencies in OWNER-furnished information.

C. ENGINEER shall perform or furnish professional engineering and related services in all phases of the Project to which this Agreement applies. ENGINEER shall serve as OWNER's prime professional for the Project. ENGINEER may employ such ENGINEER's Consultants as ENGINEER deems necessary to assist in the performance or furnishing of the services. ENGINEER shall not be required to employ any ENGINEER's Consultant unacceptable to ENGINEER.

D. ENGINEER and OWNER shall comply with applicable Laws or Regulations and OWNER-mandated standards. This Agreement is based on these requirements as of its Effective Date. Changes to these requirements after the Effective Date of this Agreement may be the basis for modifications to OWNER's responsibilities or to ENGINEER's scope of services, times of performance, or compensation.

E. OWNER shall be responsible for, and ENGINEER may rely upon, the accuracy and completeness of all requirements, programs, instructions, reports, data, and other information furnished by OWNER to ENGINEER pursuant to this Agreement. ENGINEER may use such requirements, reports, data, and information in performing or furnishing services under this Agreement.

F. OWNER shall make decisions and carry out its other responsibilities in a timely manner and shall bear all costs incident thereto so as not to delay the services of ENGINEER.

G. ENGINEER shall not be required to sign any documents, no matter by whom requested, that would result in the ENGINEER's having to certify, guarantee or warrant the existence of conditions whose existence the ENGINEER cannot ascertain. OWNER agrees not to make resolution of any dispute with the ENGINEER or payment of any amount due to the ENGINEER in any way contingent upon the ENGINEER's signing any such certification.

H. During the Construction Phase, ENGINEER shall not supervise, direct, or have control over Contractor's work, nor shall ENGINEER have authority over or responsibility for the means, methods, techniques, sequences, or procedures of construction selected by Contractor, for safety precautions and programs incident to the Contractor's work in progress, nor for any failure of Contractor to comply with Laws and Regulations applicable to Contractor's furnishing and performing the Work.

I. ENGINEER neither guarantees the performance of any Contractor nor assumes responsibility for any Contractor's failure to furnish and perform the Work in accordance with the Contract Documents.

J. ENGINEER shall not be responsible for the acts or omissions of any Contractor(s), subcontractor or supplier, or

of any of the Contractor's agents or employees or any other persons (except ENGINEER's own employees) at the Site or otherwise furnishing or performing any of the Contractor's work; or for any decision made on interpretations or clarifications of the Contract Documents given by OWNER without consultation and advice of ENGINEER.

5.02 Authorized Project Representatives

A. Contemporaneous with the execution of this Agreement, ENGINEER and OWNER shall designate specific individuals to act as ENGINEER's and OWNER's representatives with respect to the services to be performed or furnished by ENGINEER and responsibilities of OWNER under this Agreement. Such individuals shall have authority to transmit instructions, receive information, and render decisions relative to the Project on behalf of each respective party.

5.03 Use of Documents

A. All Documents are instruments of service in respect to this Project, and ENGINEER shall retain an ownership and property interest therein (including the right of reuse at the discretion of the ENGINEER) whether or not the Project is completed.

B. Copies of OWNER-furnished data that may be relied upon by ENGINEER are limited to the printed copies (also known as hard copies) that are delivered to the ENGINEER. Files in electronic media format of text, data, graphics, or of other types that are furnished by OWNER to ENGINEER are only for convenience of ENGINEER. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.

C. Copies of Documents that may be relied upon by OWNER are limited to the printed copies (also known as hard copies) that are signed or sealed by the ENGINEER. Files in electronic media format of text, data, graphics, or of other types that are furnished by ENGINEER to OWNER are only for convenience of OWNER. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.

D. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the party delivering the electronic files. ENGINEER shall not be responsible to maintain documents stored in electronic media format after acceptance by OWNER.

E. When transferring documents in electronic media format, ENGINEER makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by ENGINEER at the beginning of this Project.

F. OWNER may make and retain copies of Documents for information and reference in connection with use on the Project by OWNER. Such Documents are not intended or represented to be suitable for reuse by OWNER or others on extensions of the Project or on any other project. Any such reuse or modification without written verification or adaptation by ENGINEER, as appropriate for the specific purpose intended, will be at OWNER's sole risk and without liability or legal exposure to ENGINEER or to ENGINEER's Consultants. OWNER shall indemnify and hold harmless ENGINEER and ENGINEER's Consultants from all claims, damages, losses, and expenses, including attorneys' fees arising out of or resulting therefrom.

G. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

H. Any verification or adaptation of the Documents for extensions of the Project or for any other project will entitle ENGINEER to further compensation at rates to be agreed upon by OWNER and ENGINEER.

5.04 Insurance

A. The ENGINEER shall maintain the following insurance:

1. Workmen's Compensation
2. Employer's Liability Insurance
3. General Liability Insurance
4. Automobile Liability Insurance

B. OWNER will maintain similar insurance.

5.05 Termination

A. The obligation to provide further services under this Agreement may be terminated:

1. *For cause*,

a. By either party upon 30 days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party.

b. By ENGINEER:

I) upon seven days written notice if ENGINEER believes that ENGINEER is being requested by OWNER to furnish or

perform services contrary to ENGINEER's responsibilities as a licensed professional; or

2) upon seven days written notice if the ENGINEER's services for the Project are delayed or suspended for more than 90 days for reasons beyond ENGINEER's control.

3) ENGINEER shall have no liability to OWNER on account of such termination.

c. Notwithstanding the foregoing, this Agreement will not terminate as a result of such substantial failure if the party receiving such notice begins, within seven days of receipt of such notice, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt thereof; provided, however, that if and to the extent such substantial failure cannot be reasonably cured within such 30 day period, and if such party has diligently attempted to cure the same and thereafter continues diligently to cure the same, then the cure period provided for herein shall extend up to, but in no case more than, 60 days after the date of receipt of the notice.

2. *For convenience*,

a. By OWNER effective upon the receipt of notice by ENGINEER.

B. The terminating party may set the effective date of termination at a time up to 30 days later than otherwise provided to allow ENGINEER to demobilize personnel and equipment from the Site, to complete tasks whose value would otherwise be lost, to prepare notes as to the status of completed and uncompleted tasks, and to assemble Project materials in orderly files.

5.06 Controlling Law

A. This Agreement is to be governed by the laws of the State of Ohio.

5.07 Successors, Assigns, and Beneficiaries

A. OWNER and ENGINEER each is hereby bound and the partners, successors, executors, administrators and legal representatives of OWNER and ENGINEER (and to the extent permitted by paragraph 5.07.B the assigns of OWNER and ENGINEER) are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of this Agreement.

B. Neither OWNER nor ENGINEER may assign, sublet, or transfer any rights under or interest (including, but without limitation, moneys that are due or may become due) in this Agreement without the written consent of the other, except to the extent that any assignment, subletting, or transfer is mandated or restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement.

C. Unless expressly provided otherwise in this Agreement:

1. Nothing in this Agreement shall be construed to create, impose, or give rise to any duty owed by OWNER or ENGINEER to any Contractor, Contractor's subcontractor, supplier, other individual or entity, or to any surety for or employee of any of them.

2. All duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of OWNER and ENGINEER and not for the benefit of any other party. The OWNER agrees that the substance of the provisions of this paragraph shall appear in any Contract Documents.

5.08 Dispute Resolution

A. OWNER and ENGINEER agree to negotiate all disputes between them in good faith for a period of 30 days from the date of notice prior to exercising their right to arbitrate, or under law. In the absence of such an agreement, the parties may exercise their rights under law, but agree to submit to the personal and exclusive jurisdiction of the courts located within Knox County, Ohio to resolve the dispute.

5.09 Hazardous Environmental Condition

A. OWNER represents to Engineer that to the best of its knowledge a Hazardous Environmental Condition does not exist.

B. OWNER has disclosed to the best of its knowledge to ENGINEER the existence of all Asbestos, PCB's, Petroleum, Hazardous Waste, or Radioactive Material located at or near the Site, including type, quantity and location.

C. If a Hazardous Environmental Condition is encountered or alleged, ENGINEER shall have the obligation to notify OWNER and, to the extent of applicable Laws and Regulations, appropriate governmental officials.

D. It is acknowledged by both parties that ENGINEER's scope of services does not include any services related to a Hazardous Environmental Condition. In the event ENGINEER or any other party encounters a Hazardous Environmental Condition, ENGINEER may, at its option and without liability for consequential or any other damages, suspend performance of services on the portion of the Project affected thereby until OWNER: (i) retains

appropriate specialist consultant(s) or contractor(s) to identify and, as appropriate, abate, remediate, or remove the Hazardous Environmental Condition; and (ii) warrants that the Site is in full compliance with applicable Laws and Regulations.

E. OWNER acknowledges that ENGINEER is performing professional services for OWNER and that ENGINEER is not and shall not be required to become an "arranger," "operator," "generator," or "transporter" of hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA), which are or may be encountered at or near the Site in connection with ENGINEER's activities under this Agreement.

F. If ENGINEER's services under this Agreement cannot be performed because of a Hazardous Environmental Condition, the existence of the condition shall justify ENGINEER's terminating this Agreement for cause on 30 days notice.

5.10 Allocation of Risks

A. Indemnification

1. To the fullest extent permitted by law, ENGINEER shall indemnify and hold harmless OWNER, OWNER's officers, directors, partners, and employees from and against any and all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused solely by the negligent acts or omissions of ENGINEER or ENGINEER's officers, directors, partners, employees, and ENGINEER's Consultants in the performance and furnishing of ENGINEER's services under this Agreement.

2. To the fullest extent permitted by law, OWNER shall indemnify and hold harmless ENGINEER, ENGINEER's officers, directors, partners, employees, and ENGINEER's Consultants from and against any and all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused solely by the negligent acts or omissions of OWNER or OWNER's officers, directors, partners, employees, and OWNER's consultants with respect to this Agreement or the Project.

3. To the fullest extent permitted by law, ENGINEER's total liability to OWNER and anyone claiming by, through, or under OWNER for any cost, loss, or damages caused in part by the negligence of ENGINEER and in part by the negligence of OWNER or any other negligent entity or individual, shall not exceed the percentage share that ENGINEER's negligence bears to the total negligence of OWNER, ENGINEER, and all other negligent entities and individuals and in no case shall this liability exceed the maximum fee amount.

4. In addition to the indemnity provided under paragraph 5.10.A.2 of this Agreement, and to the fullest extent permitted by law, OWNER shall indemnify and hold harmless ENGINEER and its officers, directors, partners, employees, and ENGINEER's Consultants from and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from a Hazardous Environmental Condition, provided that (i) any such cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than completed Work), including the loss of use resulting therefrom, and (ii) nothing in this paragraph 5.10.A.4. shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence or willful misconduct.

5.11 Notices

A. Any notice required under this Agreement will be in writing, addressed to the appropriate party at its address on the signature page and given personally, or by registered or certified mail postage prepaid, or by a commercial courier service. All notices shall be effective upon the date of receipt.

5.12 Survival

A. All express representations, indemnifications, or limitations of liability included in this Agreement will survive its completion or termination for any reason.

5.13 Severability

A. Any provision or part of the Agreement held to be void or unenforceable under any Laws or Regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and ENGINEER, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

5.14 Waiver

A. Non-enforcement of any provision by either party shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Agreement.

February 1, 2021

Mr. Brian W. Ball, P.E.
City Engineer
City of Mount Vernon
40 Public Square
Mount Vernon, Ohio 43050

Dear Mr. Ball:

Subject: Proposal for Professional Services
Wastewater Treatment Plant Improvements Facility Planning and Funding Application – Ohio EPA Water Pollution Control Loan Fund (WPCLF)
City of Mount Vernon, Knox County, Ohio
CEC Project 310-731

Civil & Environmental Consultants, Inc. (CEC) is pleased to present our proposal to provide professional civil engineering services related to the City of Mount Vernon's existing Wastewater Treatment Plant Improvements, located in the City of Mount Vernon, Knox County, Ohio. The Scope of this proposal will be the completion of a Facility Plan which will provide a description and details related to the proposed Wastewater Treatment Plant Improvements to be under-taken by the City as well as the completion of the Ohio Environmental Protection Agency (OEPA) Water Pollution Control Loan Fund (WPCLF) loan application.

1.0 PROJECT DESCRIPTION

The City of Mount Vernon (City) is having performance and operational issues with its two (2) anaerobic digesters located at their existing 5 MGD Wastewater Treatment Plant (WWTP). The City is proposing to make improvements to the anaerobic digestion process by installing linear motion mixers in each digester to improve and enhance the anaerobic digestion process. This project will consist of the installation of new steel floating covers with gas storage to be installed on each of the two (2) anaerobic digesters, the installation of two (2) new heat exchangers, and the installation of a Huber Sludgecleaner Strainpress® to provide continuous screening and removal of coarse material from the primary sludge and septage receiving sludge prior to entering the digesters. The City also proposes to seek design and construction loans as part of a nutrient reduction project in which Phosphorus (P) will be targeted for reduction from the WWTP's effluent. The planning phase for this component of the project will evaluate processes utilizing Chemical Phosphorus Removal, Biological Phosphorus Removal, and Side Stream Phosphorus Removal. Lastly, the project will include the addition of sludge de-watering facilities including a belt-filter press, polymer feed system, and lime stabilization in order to effectively produce a Class B sludge for disposal by land application.

2.0 PURPOSE

The purpose of this proposal is to provide professional civil engineering services required as part of the planning process in order to secure funding for the WWTP improvement project described above. This proposal will be focused on completing the necessary facility planning and loan application required in order to secure funding via the OEPA WPCLF.

3.0 SCOPE OF SERVICES

This proposal for professional services is based on CECs current involvement and understanding of the current status of the anaerobic digesters at the WWTP, discussions and planning activities with City wastewater staff regarding P reduction to date, and CECs past experience on projects of similar scope. The following information forms the basis for our scope of services:

(1) CEC will complete a Facility Plan and WPCLF Loan Application in accordance with OEPA funding requirements. The Facility Plan will describe the proposed WWTP Improvements, program funding selection, borrowers information, detailed project descriptions, funding type and proposed loan terms, project contact information, project schedules, cost data, revenue analysis, source of pledged revenues, proposed rate schedules, additional capital improvements, projections of operation revenues and expenses, equipment and replacement schedule, and other items as required by the funding agency.

(2) CEC will submit the Facility Plan and completed WPCLF Loan Application as applicable to the Ohio EPA. CECs estimated costs for professional engineering services include addressing comments by the funding agency during the review phase and to address a maximum of one (1) round of agency review comments, which is the typical number of submittals required for these applications.

CEC has prepared a scope of services for each of the major project components, divided into two (2) tasks. It should be understood that our scope of services are the base services anticipated by CEC. This scope of services and associated costs may require revision as the project progresses.

Task 1. Preparation of Facility Plan and OEPA WPCLF Loan Application

Task 2. Electronic submission of required documentation and address agency review comments

CEC will make site visits to the WWTP and coordinate planning activities with the City Engineer and appropriate staff as directed by the Owner.

4.0 INVOICING AND PROJECT COSTS

CEC proposes to complete the above outlined scope of services on a lump sum basis for the fees below. Invoicing for additional professional services will be in accordance with the 2021 Columbus Civil and Survey Category Rate Table. Subcontracted services will be invoiced at cost plus a 12% administrative fee. Based on our understanding of the project and the proposed services, the fees to complete these services, on a task by task basis, are listed below.

Task 1	Preparation of facility Plan and Loan Application	$ 20,000
Task 2	Electronic Submission and address agency review comments	$ 5,000
	ESTIMATED TOTAL	**$ 25,000**

Invoicing will be done monthly and tasks will be billed on a percent complete basis. All reimbursables are included in the lump sum costs provided.

5.0 TERMS AND CONDITIONS

The City's Standard of Terms and Conditions, which apply to the proposed work, is attached. Changes to the Terms and Conditions must be agreed to in writing by both parties prior to authorization to proceed.

6.0 SCHEDULE

CEC is staffed with experienced civil engineers and will initiate work on this project upon your authorization to proceed. CEC will work with the City to meet their Schedule and Major Milestones as well as any deadlines required by the funding agency.

7.0 CLOSING

CEC appreciates the opportunity to provide you with this scope of services to assist you with this project. Please contact Travis Adams at 304-848-7163 or Matt Fluharty at 304-848-7155 should you have any questions.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Travis Adams
Sr. Project Manager

Matthew Fluharty, PE
Principal

Enclosures: 2021 Rate Schedule
Schedule of Terms & Conditions

Proposal accepted by:

2/2/21

Richard S. Dzik, Safety-Service Director

2021 RATE SCHEDULE

Category rate table #366:
2021 Columbus Civil & Survey Rates

Title	Rate
Vice-President	$218.00
Senior Principal	$213.00
Principal	$202.00
Senior Project Manager	$186.00
Project Manager III	$170.00
Partner, Principal or Director	$170.00
Project Land Surveyor	$149.00
CADD Manager	$143.00
Project Manager II	$143.00
Principal Land Surveyor	$143.00
Senior CADD Technician	$143.00
Project Manager I	$128.00
1-Man Survey Crew	$122.00
Assistant Project Manager - Scientist	$116.00
Assistant Project Manager	$116.00
Senior Construction Technician I	$111.00
Senior Survey Technician	$111.00
Senior Field Technician	$106.00
Project Manager - Surveying	$106.00
Senior Construction Technician	$106.00
Professional Land Surveyor	$104.00
Project Engineer	$104.00
Project Consultant	$104.00
Senior Designer	$98.00
Designer	$96.00
Staff Consultant	$94.00
Cadd Designer III	$94.00
Staff Engineer I	$92.00
Senior Technician	$91.00
2-Man Survey Crew	$91.00
Survey Crew Chief	$91.00
Survey Technician IV	$91.00
Project Scientist	$84.00
Technician II	$79.00
Archeological Principal Investigator	$79.00
CADD Designer II	$79.00
Survey Technician III	$79.00
Technician I	$79.00
Survey Technician III	$79.00
GIS Specialist	$79.00
Field Technician	$79.00
GIS Analyst I	$79.00
Office Manager	$74.00
Accounting Assistance	$74.00
Administrative	$74.00
Secretary	$69.00
Staff Scientist	$69.00
Cad Operator	$69.00
CADD Operator I	$69.00
Cadd Technician	$69.00
Survey Technician II	$69.00

Staff Scientist I	$69.00
Draftsperson	$69.00
Survey Technician II	$69.00
Survey Technician I	$64.00
Survey Technician	$64.00
Survey Technician I	$64.00
Survey Assistant	$64.00
Construction Technician I	$64.00
Junior Consultant	$59.00
Junior Technician	$59.00
Assistant Office Manager	$59.00
Seasonal Intern	$59.00

Printed on 2/1/121.

SCHEDULE OF TERMS AND CONDITIONS

City of Mount Vernon
STANDARD TERMS & CONDITIONS

The following conditions and provisions define the basic terms relating to the services and compensation agreed to and as outlined on the attached Letter Agreement and/or Work Authorization.

Agreement Date:

Owner: City of Mount Vernon, Ohio

Owner's Signature: _____
Richard S. Dzik, Safety-Service Director

Date: 2-2-2021

FIRM:
Representative's Signature: Travis O. Adams
SR. PM

Date: 3-8-2021

I hereby certify that funds in the amount in the amount of $ _____ have been lawfully appropriated for the purpose of meeting the obligations of this Contract and are in the Treasury or are in the process of collection to the credit of the appropriate fund, free from prior encumbrance.

Maximum certification for this contract shall be

$ 25,000.00

Date: 02 February 2021

Terry Scott, City Auditor

ARTICLE 1 - SERVICES OF FIRM

1.01 Scope

A. FIRM shall provide all Services set forth herein and upon this Agreement becoming effective, FIRM is authorized to begin unless otherwise stipulated to by the OWNER.

ARTICLE 2 - TIMES FOR RENDERING SERVICES

2.01 General

A. FIRM's services and compensation under this Agreement have been agreed to in anticipation of the orderly and continuous progress of the Project through completion as outlined in the proposal letter to Brian Ball, on February 1, 2021.

#310-731

Unless specific periods of time or specific dates for providing services are specified in this Agreement, FIRM's obligation to render services hereunder will be for a period which may reasonably be required for the completion of said services.

B. If in this Agreement specific periods of time for rendering services are set forth or specific dates by which services are to be completed are provided, and if such periods of time or dates are changed through no fault of FIRM, the rates and amounts of compensation provided for herein shall be subject to equitable adjustment. If OWNER has requested changes in the scope, extent, or character of the Project, the time of performance of FIRM's services shall be adjusted equitably.

C. For purposes of this Agreement the term "day" means a calendar day of 24 hours.

2.02 Suspension

A. If OWNER fails to give prompt written authorization to proceed with any phase of services after completion of the immediately preceding phase, or if FIRM's services are delayed through no fault of FIRM, FIRM may, after giving seven days written notice to OWNER, suspend services under this Agreement.

B. If FIRM's services are delayed or suspended in whole or in part by OWNER, or if FIRM's services are extended by Contractor's actions or inactions for more than 90 days through no fault of FIRM, FIRM shall be entitled to equitable adjustment of rates and amounts of compensation provided for elsewhere in this Agreement to reflect, reasonable costs incurred by FIRM in connection with, among other things, such delay or suspension and reactivation and the fact that the time for performance under this Agreement has been revised.

ARTICLE 3 - PAYMENTS TO FIRM

3.01 Methods of Payment for Services and Reimbursable Expenses of FIRM

A. *Preparation of Invoices.* Invoices will be prepared in accordance with FIRM's standard invoicing practices and will be submitted monthly to OWNER by FIRM, unless otherwise agreed. The amount billed in each invoice will be calculated as set forth in the Agreement including additional services and reimbursable costs, if any.

B. *Payment of Invoices.* Invoices are due and payable within 30 days of receipt of an acceptable invoice. In addition, FIRM may, after giving seven days written notice to OWNER, suspend services under this Agreement until FIRM has been paid in full all amounts due for services, expenses, and other related charges.

C. *Disputed Invoices.* In the event of a disputed or contested invoice, only that portion so contested may be withheld from payment, and the undisputed portion will be paid.

D. *Payments Upon Termination.*

1. In the event of any termination, FIRM will be entitled to invoice OWNER and will be paid for all services performed or furnished and all Reimbursable Expenses incurred through the effective date of termination.

2. This paragraph intentionally left blank.

ARTICLE 4 - OPINIONS OF COST

4.01 Opinions of Probable Construction Cost

A. FIRM's opinions of probable Construction Cost provided for herein are to be made on the basis of FIRM's experience and qualifications and represent FIRM's best judgment as an experienced and qualified professional generally familiar with the industry. However, since FIRM has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, FIRM cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by FIRM. If OWNER wishes greater assurance as to probable Construction Cost, OWNER shall employ an independent cost estimator.

ARTICLE 5 - GENERAL CONSIDERATIONS

5.01 Standards of Performance

A. The standard of care for all professional engineering and related services performed or furnished by FIRM under this Agreement will be the care and skill ordinarily used by members of FIRM's profession practicing under similar circumstances at the same time and in the same locality. FIRM makes no warranties, express or implied, under this Agreement or otherwise, in connection with FIRM's services.

B. FIRM shall be responsible for the technical accuracy of its services and documents resulting therefrom, and OWNER shall not be responsible for discovering deficiencies therein. FIRM shall correct such deficiencies without additional compensation except to the extent such action is directly attributable to deficiencies in OWNER-furnished information.

C. FIRM shall perform or furnish professional engineering and related services in all phases of the Project to which this Agreement applies. FIRM shall serve as OWNER's prime professional for the Project. FIRM may employ such FIRM's Consultants as FIRM deems necessary to assist in the performance or furnishing of the services. FIRM shall not be required to employ any FIRM's Consultant unacceptable to FIRM.

D. FIRM and OWNER shall comply with applicable Laws or Regulations and OWNER-mandated standards. This Agreement is based on these requirements as of its Effective Date. Changes to these requirements after the Effective Date of this Agreement may be the basis for modifications to OWNER's responsibilities or to FIRM's scope of services, times of performance, or compensation.

E. OWNER shall be responsible for, and FIRM may rely upon, the accuracy and completeness of all requirements, programs, instructions, reports, data, and other information furnished by OWNER to FIRM pursuant to this Agreement. FIRM may use such requirements, reports, data, and information in performing or furnishing services under this Agreement.

F. OWNER shall make decisions and carry out its other responsibilities in a timely manner and shall bear all costs incident thereto so as not to delay the services of FIRM.

G. FIRM shall not be required to sign any documents, no matter by whom requested, that would result in the FIRM's having to certify, guarantee or warrant the existence of conditions whose existence the FIRM cannot ascertain. OWNER agrees not to make resolution of any dispute with the FIRM or payment of any amount due to the FIRM in any way contingent upon the FIRM's signing any such certification.

H. During the Construction Phase, FIRM shall not supervise, direct, or have control over Contractor's work, nor shall FIRM have authority over or responsibility for the means, methods, techniques, sequences, or procedures of construction selected by Contractor, for safety precautions and programs incident to the Contractor's work in progress, nor for any failure of Contractor to comply with Laws and Regulations applicable to Contractor's furnishing and performing the Work.

I. FIRM neither guarantees the performance of any Contractor nor assumes responsibility for any Contractor's failure to furnish and perform the Work in accordance with the Contract Documents.

J. FIRM shall not be responsible for the acts or omissions of any Contractor(s), subcontractor or supplier, or of any of the Contractor's agents or employees or any other persons (except FIRM's own employees) at the Site or otherwise furnishing or performing any of the Contractor's

work; or for any decision made on interpretations or clarifications of the Contract Documents given by OWNER without consultation and advice of FIRM.

5.02 Authorized Project Representatives

A. Contemporaneous with the execution of this Agreement, FIRM and OWNER shall designate specific individuals to act as FIRM's and OWNER's representatives with respect to the services to be performed or furnished by FIRM and responsibilities of OWNER under this Agreement. Such individuals shall have authority to transmit instructions, receive information, and render decisions relative to the Project on behalf of each respective party.

5.03 Use of Documents

A. All Documents are instruments of service in respect to this Project, and FIRM shall retain an ownership and property interest therein (including the right of reuse at the discretion of the FIRM) whether or not the Project is completed.

B. Copies of OWNER-furnished data that may be relied upon by FIRM are limited to the printed copies (also known as hard copies) that are delivered to the FIRM. Files in electronic media format of text, data, graphics, or of other types that are furnished by OWNER to FIRM are only for convenience of FIRM. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.

C. Copies of Documents that may be relied upon by OWNER are limited to the printed copies (also known as hard copies) that are signed or sealed by the FIRM. Files in electronic media format of text, data, graphics, or of other types that are furnished by FIRM to OWNER are only for convenience of OWNER. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.

D. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the party delivering the electronic files. FIRM shall not be responsible to maintain documents stored in electronic media format after acceptance by OWNER.

E. When transferring documents in electronic media format, FIRM makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by FIRM at the beginning of this Project.

F. OWNER may make and retain copies of Documents for information and reference in connection with use on the Project by OWNER. Such Documents are not intended or represented to be suitable for reuse by OWNER or others on extensions of the Project or on any other project. Any such reuse or modification without written verification or adaptation by FIRM, as appropriate for the specific purpose intended, will be at OWNER's sole risk and without liability or legal exposure to FIRM or to FIRM's Consultants. OWNER shall indemnify and hold harmless FIRM and FIRM's Consultants from all claims, damages, losses, and expenses, including attorneys' fees arising out of or resulting therefrom.

G. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

H. Any verification or adaptation of the Documents for extensions of the Project or for any other project will entitle FIRM to further compensation at rates to be agreed upon by OWNER and FIRM.

5.04 Insurance

A. The FIRM shall maintain the following insurance:

1. Workmen's Compensation
2. Employer's Liability Insurance
3. General Liability Insurance
4. Automobile Liability Insurance

B. OWNER will maintain similar insurance.

5.05 Termination

A. The obligation to provide further services under this Agreement may be terminated:

1. *For cause*,

a. By either party upon 30 days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party.

b. By FIRM:

1) upon seven days written notice if FIRM believes that FIRM is being requested by OWNER to furnish or perform services contrary to FIRM's responsibilities as a licensed professional; or

2) upon seven days written notice if the FIRM's services for the Project are delayed or

suspended for more than 90 days for reasons beyond FIRM's control.

3) FIRM shall have no liability to OWNER on account of such termination.

c. Notwithstanding the foregoing, this Agreement will not terminate as a result of such substantial failure if the party receiving such notice begins, within seven days of receipt of such notice, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt thereof; provided, however, that if and to the extent such substantial failure cannot be reasonably cured within such 30 day period, and if such party has diligently attempted to cure the same and thereafter continues diligently to cure the same, then the cure period provided for herein shall extend up to, but in no case more than, 60 days after the date of receipt of the notice.

2. *For convenience*,

a. By OWNER effective upon the receipt of notice by FIRM.

B. The terminating party may set the effective date of termination at a time up to 30 days later than otherwise provided to allow FIRM to demobilize personnel and equipment from the Site, to complete tasks whose value would otherwise be lost, to prepare notes as to the status of completed and uncompleted tasks, and to assemble Project materials in orderly files.

5.06 Controlling Law

A. This Agreement is to be governed by the laws of the State of Ohio.

5.07 Successors, Assigns, and Beneficiaries

A. OWNER and FIRM each is hereby bound and the partners, successors, executors, administrators and legal representatives of OWNER and FIRM (and to the extent permitted by paragraph 5.07.B the assigns of OWNER and FIRM) are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of this Agreement.

B. Neither OWNER nor FIRM may assign, sublet, or transfer any rights under or interest (including, but without limitation, moneys that are due or may become due) in this Agreement without the written consent of the other, except to the extent that any assignment, subletting, or transfer is mandated or restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement.

C. Unless expressly provided otherwise in this Agreement:

1. Nothing in this Agreement shall be construed to create, impose, or give rise to any duty owed by OWNER or FIRM to any Contractor, Contractor's subcontractor, supplier, other individual or entity, or to any surety for or employee of any of them.

2. All duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of OWNER and FIRM and not for the benefit of any other party. The OWNER agrees that the substance of the provisions of this paragraph shall appear in any Contract Documents.

5.08 Dispute Resolution

A. OWNER and FIRM agree to negotiate all disputes between them in good faith for a period of 30 days from the date of notice prior to exercising their right to arbitrate, or under law. In the absence of such an agreement, the parties may exercise their rights under law, but agree to submit to the personal and exclusive jurisdiction of the courts located within Knox County, Ohio to resolve the dispute.

5.09 Hazardous Environmental Condition

A. OWNER represents to FIRM that to the best of its knowledge a Hazardous Environmental Condition does not exist.

B. OWNER has disclosed to the best of its knowledge to FIRM the existence of all Asbestos, PCB's, Petroleum, Hazardous Waste, or Radioactive Material located at or near the Site, including type, quantity and location.

C. If a Hazardous Environmental Condition is encountered or alleged, FIRM shall have the obligation to notify OWNER and, to the extent of applicable Laws and Regulations, appropriate governmental officials.

D. It is acknowledged by both parties that FIRM's scope of services does not include any services related to a Hazardous Environmental Condition. In the event FIRM or any other party encounters a Hazardous Environmental Condition, FIRM may, at its option and without liability for consequential or any other damages, suspend performance of services on the portion of the Project affected thereby until OWNER: (i) retains appropriate specialist consultant(s) or contractor(s) to identify and, as appropriate, abate, remediate, or remove the Hazardous Environmental Condition; and (ii) warrants that the Site is in full compliance with applicable Laws and Regulations.

E. OWNER acknowledges that FIRM is performing professional services for OWNER and that FIRM is not and shall not be required to become an "arranger," "operator,"

"generator," or "transporter" of hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA), which are or may be encountered at or near the Site in connection with FIRM's activities under this Agreement.

F. If FIRM's services under this Agreement cannot be performed because of a Hazardous Environmental Condition, the existence of the condition shall justify FIRM's terminating this Agreement for cause on 30 days notice.

5.10 Allocation of Risks

A. Indemnification

1. To the fullest extent permitted by law, FIRM shall indemnify and hold harmless OWNER, OWNER's officers, directors, partners, and employees from and against any and all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused solely by the negligent acts or omissions of FIRM or FIRM's officers, directors, partners, employees, and FIRM's Consultants in the performance and furnishing of FIRM's services under this Agreement.

2. To the fullest extent permitted by law, OWNER shall indemnify and hold harmless FIRM, FIRM's officers, directors, partners, employees, and FIRM's Consultants from and against any and all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused solely by the negligent acts or omissions of OWNER or OWNER's officers, directors, partners, employees, and OWNER's consultants with respect to this Agreement or the Project.

3. To the fullest extent permitted by law, FIRM's total liability to OWNER and anyone claiming by, through, or under OWNER for any cost, loss, or damages caused in part by the negligence of FIRM and in part by the negligence of OWNER or any other negligent entity or individual, shall not exceed the percentage share that FIRM's negligence bears to the total negligence of OWNER, FIRM, and all other negligent entities and individuals and in no case shall this liability exceed the maximum fee amount.

4. In addition to the indemnity provided under paragraph 5.10.A.2 of this Agreement, and to the fullest extent permitted by law, OWNER shall indemnify and hold harmless FIRM and its officers, directors, partners, employees, and FIRM's Consultants from and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from a Hazardous Environmental Condition, provided that (i) any such cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than completed Work), including the loss of use resulting therefrom, and (ii) nothing in this paragraph 5.10.A.4. shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence or willful misconduct.

5.11 Notices

A. Any notice required under this Agreement will be in writing, addressed to the appropriate party at its address on the signature page and given personally, or by registered or certified mail postage prepaid, or by a commercial courier service. All notices shall be effective upon the date of receipt.

5.12 Survival

A. All express representations, indemnifications, or limitations of liability included in this Agreement will survive its completion or termination for any reason.

5.13 Severability

A. Any provision or part of the Agreement held to be void or unenforceable under any Laws or Regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and FIRM, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

5.14 Waiver

A. Non-enforcement of any provision by either party shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Agreement.

Sludge Holding Tank #1
422,680 gal

Sludge Holding Tank #2
422,680 gal

Dig #1
255,985 gal

Dig #2
255,985 gal

Sludge Draw Building Primary Sludge Pumps

Aeration Tank with Grit Removal
17,350 gal

Primary Building and Wet Well
38,000 gal

Head Works

Settling Tank #1
107,712 gal

Settling Tank #2
107,712 gal

Settling Tank #3
107,712 gal

Settling Tank #4
107,712 gal

Secondary Building and Wet Well
23,250 gal

North Final Tank Chlorine Contact
64,874 gal

South Final Tank Chlorine Contact
64,874 gal

Aerobic Dig #1
443,000 gal

Sludge Well #1
20,000 gal

Secondary Clarifier #1

Reaeration #1
280,000 gal

Contact #1
139,000 gal

Contact #2
139,000 gal

Reaeration #2
280,000 gal

Sludge Well #2
20,000 gal

Secondary Clarifier #2
94,958 gal

Aerobic Dig #2
443,000 gal

Civil & Environmental Consultants, Inc.
120 Genesis Boulevard · Bridgeport, WV 26330
Ph: 304.933.3119 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON, OHIO
PHOSPHORUS REMOVAL
PLANNING

EXISTING WASTE WATER TREATMENT PLANT
PROCESS SCHEMATIC

DRAWN BY:	KES	CHECKED BY:	DRAFT	APPROVED BY:	DRAFT
DATE:	JUNE, 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	310-731

EXHIBIT: 1

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Mount Vernon Wastewater Treatment Plant (WWTP)

Public Notice No.: 19-07-026
Public Notice Date: July 9, 2019
Comment Period Ends: August 8, 2019

Ohio EPA Permit No.: 4PD00100*ND
Application No.: OH0026662

Name and Address of Applicant:
City of Mount Vernon
40 Public Square
Mount Vernon, Ohio 43050

Name and Address of Facility Where Discharge Occurs:
Mount Vernon Wastewater Treatment Plant
3 Cougar Drive
Mount Vernon, Ohio 43050
Knox County

Receiving Water: Kokosing River

Subsequent Stream Network: Walhonding River, Muskingum River, Ohio River

INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency (Ohio EPA), as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the

discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

SUMMARY OF PERMIT CONDITIONS

Most permit conditions, limits, and monitoring frequencies will remain the same as in the existing permit, with the following proposed changes.
Annual chronic toxicity monitoring with the determination of acute endpoints is proposed to continue for the life of the permit. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

This permit no longer authorizes the use of method 4500 CN-I from Standard Methods for free cyanide testing. As soon as possible, the permittee must begin using OIA-1677-09, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

Increased zinc monitoring frequency at monitoring station 001.

Increased *E. coli* monitoring frequencies at monitoring stations 801 and 901.

A schedule of compliance for the Mt. Vernon WWTP pretreatment local limit justification, activities related to a new phosphorous optimization treatment system, and elimination of SSOs at the Clinton Road pump station are included in Part I.C of the permit.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; effluent limits below quantification, whole effluent toxicity (WET) testing; storm water compliance; pretreatment program requirements; and outfall signage.

Table of Contents

List of Figures

List of Tables

List of Addendums

PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact John Owen by phone at 614-728-3849, or by email at john.owen@epa.ohio.gov, or Nick McGovern by phone at 614-644-2146, or by email at nicholas.mcgovern@epa.ohio.gov.

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to

accomplishment of the purposes of this chapter. This determination was made based on data and information available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, a written request for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

The Mount Vernon WWTP discharges to the Kokosing River at River Mile 24.9. Figure 1 shows the approximate location of the facility.

This segment of the Kokosing River is described by Ohio EPA River Code: 17-650, Hydrologic Unit Code: 05040003-03-04, County: Knox, Ecoregion: Erie-Ontario Lake Plain. The Kokosing River is designated for the following uses under Ohio's WQS (OAC 3745-1-24): Exceptional Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

The Mt. Vernon WWTP was constructed in 1952 and last upgraded in 2014. The average design flow is 5.0 million gallons per day (MGD). Mt. Vernon WWTP serves the City of Mount Vernon and Clinton Township. Mt. Vernon WWTP has the following treatment processes which are shown on Figure 2:

- Influent Pumping
- Grit Removal
- Primary Sedimentation
- Pre-aeration
- Activated Sludge-contact Stabilization
- Post-aeration
- Secondary Clarification
- Chlorination and De-chlorination

Mt. Vernon WWTP has an internal secondary treatment bypass that is designated station 602. Flow bypasses secondary treatment and clarification and is combined with fully treated flow prior to disinfection and final sampling. The Mt. Vernon WWTP has 100% separated sewers in the collection system.

The City of Mount Vernon does have an approved pretreatment program, which has 0 categorical users, and 5 significant non-categorical users that discharge 0.18 MGD of flow.

The City of Mount Vernon's potable water comes from the Municipal Water Supply.

Mt. Vernon WWTP utilizes the following sewage sludge treatment processes (Figure 2):

- Aerobic Digestion - Air
- Anaerobic Digestion
- Gravity Thickening
- Polymer, Lime, Ferric-chloride Alum Addition
- Land Spreading
- Digestor Gas Utilization Facilities

Treated sludge is land applied. Table 1 shows the last five years of sludge removed from Mt. Vernon WWTP.

DESCRIPTION OF EXISTING DISCHARGE

Mt. Vernon had four effluent violations in the past five years, which are shown on Table 2. There were no violations between 2015 and 2017. The Total Suspended Solids (TSS) violation in 2018 occurred when power was lost on the influent pumps. When power was returned to the pumps, the facility was unable to gradually increase flow to the treatment system, and the pumps continued operating at the same capacity as when the power was initially lost. This sudden increase in flow caused settled solids to become suspended and be discharged from the facility. The 2018 ammonia violation was not caused by a known process error or upset condition, but it is suspected the high temperatures at the time of the violation was a contributing factor in affecting the facility's ability to reduce the ammonia concentration in the final effluent discharge.

Mt. Vernon has an estimated infiltration/inflow (I/I) rate of 0.811 MGD, but performs the following activities to minimize I/I: The City is actively trying to start a storm water utility. Additionally, they are constantly looking for improper connections to the collection system, and are actively disconnecting them. The average annual effluent flow rate for Mt. Vernon WWTP for the previous five years is presented on Table 3.

Mt. Vernon WWTP reports SSOs at station 300 and bypasses at station 602. The number of SSOs and bypasses are presented on Table 4 and Table 5 respectively. Actions taken by Mt. Vernon WWTP to reduce SSOs and bypassing are the same as those taken to reduce I/I, mentioned in the previous paragraph.

A summary of phosphorous loading data is presented on Table 6.

Under the provisions of 40 CFR 122.21(j), the Director has waived the requirement for submittal of expanded effluent testing data as part of the NPDES renewal application. Ohio EPA has access to substantially identical information through the submission of annual pretreatment program reports and/or from Ohio EPA effluent testing conducted.

Table 7 presents chemical specific data compiled from data reported in annual pretreatment reports.

Table 8 presents chemical specific data compiled from data collected by Ohio EPA.

Table 9 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period December 2013 to November 2018, and current permit limits are provided for comparison.

Table 10 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 11 summarizes the results of acute and chronic WET tests of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Delano Run-Kokosing River watershed assessment unit, which includes the Kokosing River in the vicinity of Mount Vernon WWTP, is listed as impaired for aquatic life use, recreational use, and human health on Ohio's 303(d) list.

The most recent data available for the Kokosing River watershed is from 2007, published May 2010 in the *Biological and Water Quality Study of the Kokosing River and Selected Tributaries 2007*. Kokosing River watershed is impaired for macroinvertebrate community and human health due to the following: nutrient loading downstream of the Mt. Vernon WWTP, sediment deposits, and elevated *E. coli* concentrations.

The following excerpt from page 171 of the study describes aquatic life impairment downstream of the Mt. Vernon WWTP:

"Just upstream of the Mount Vernon WWTP (RM 25.3) the Kokosing River flows swiftly over stable cobble and gravel substrates into well developed riffle, run, and pool sequences (Appendix A). This sampling location had the highest quality fish and macroinvertebrate community on the main stem of the river (IBI = 56, ICI = 52; Table 2, pg. 10). The next two sample sites downstream (RM 24.3 & RM 20.9) had excellent physical habitat, but showed some signs of nutrient enrichment. Pools and slower flowing run habitats of these two stream reaches had nuisance algae growth along the stream banks. The species composition and richness of the macroinvertebrate community at RM 24.3 reflected the degraded water quality (Table 2, pg. 10). Water chemistry results for RM 24.3 also confirmed excess nutrients in the river due to elevated phosphorus and nitrate levels from insufficient treated sewage effluent that came out of the Mount Vernon WWTP."

Table 12 of this report incorporates the data from the *Biological and Water Quality Study of the Kokosing River and Selected Tributaries 2007* report. This table shows the sampling site immediately downstream of the Mt. Vernon WWTP is the only site that does not achieve full attainment of aquatic life use in this stretch of the Kokosing River. This partial impairment is caused by excess nutrients attributable to the Mount Vernon WWTP.

New effluent limits are not proposed at this time. However, a phosphorous optimization treatment system is proposed for the Mt. Vernon WWTP, with a schedule of compliance, to reduce total phosphorous concentrations in the facility's final effluent discharge. Details are in Part I.C of the permit.

Recreational and human health impairments were caused by elevated concentrations of *E. coli* in the Kokosing River, the source of which is believed to be diffuse urban and agricultural storm runoff. However, sampling for *E. coli* occurred after a large storm event that likely influenced the attainment status. Additional sampling during normal flow conditions (non-storm event) did not indicate a serious bacteria threat for recreation use activities. Mount Vernon WWTP had no *E. coli* or fecal coliform violations during the previous permit cycle.

The full 2018 Integrated Report is available through the Ohio EPA, Division of Surface Water website at:

https://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport#1798510016-report

The full Biological and Water Quality Report is available through the Ohio EPA, Division of Surface Water website at:

https://epa.ohio.gov/portals/35/documents/KokosingRiverTSD2007.pdf

DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the Mt. Vernon WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA, DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	December 2013 through November 2018
Pretreatment data	2014 - 2018
Ohio EPA compliance sampling data	2017 - 2018

Statistical Outliers and Other Non-representative Data

The data were examined and the following values were removed from the evaluation as non-representative data:

- Zinc – 1300 ug/L, 03/01/2016; This value is more than five times greater than the next closest value.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 10).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 13).

Wasteload Allocation

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not break down in the receiving water. For free flowing streams, WLAs using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 14, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Table 13 and Table 14. The WLA results to maintain all applicable criteria are presented in Table 15.

Whole Effluent Toxicity Wasteload Allocation

WET is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Mt. Vernon WWTP, the WLA values are 1.0 TU_a and 3.73 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC_{25}):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

TU_c = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC_{50}) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 15. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 10, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 16.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 17 presents the final effluent limits and monitoring requirements proposed for Mt. Vernon WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Dissolved Oxygen, Summer Total Suspended Solids, Summer Ammonia, and Summer 5-day Carbonaceous Biochemical Oxygen Demand
The limits proposed for dissolved oxygen, total suspended solids, ammonia and 5-day carbonaceous biochemical oxygen demand are all based on plant design criteria. These limits are protective of WQS.

Winter Total Suspended Solids and Winter 5-day Carbonaceous Biochemical Oxygen Demand
The limits recommended for winter total suspended solids, and winter 5-day carbonaceous biochemical oxygen demand are technology-based treatment standards included in 40 CFR Part 133, Secondary Treatment Regulation. Secondary treatment is defined by the Best Practicable Waste Treatment Technology criteria, which are minimum standards required of all publicly owned treatment works.

Oil and Grease, pH, and *Escherichia coli*
Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-35 and 37). Primary contact recreation *E. coli* standards apply to the Kokosing River.

Total Residual Chlorine
The proposed limit for total residual chlorine is based on WLA as limited by the IMZM. The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limit for chlorine at outfall 001 is less than the quantification level of 0.050 mg/L. See Part II, Item L for details. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limit is being met.

Mercury and Zinc
The Ohio EPA risk assessment (Table 16) places mercury and zinc in group 4. This placement, as well as the data in Table 9 and Table 10, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2). Monitoring is proposed to continue at the same frequency for mercury, and is proposed at an increased frequency for zinc.

Cadmium, Chlorine, Chromium, Chromium VI, Copper, Free Cyanide, Lead, Nickel
The Ohio EPA risk assessment (Table 16) places these parameters in groups 2 and 3. This placement, as well as the data in Table 9 and Table 10, support that these parameters do not have the reasonable potential to contribute

to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at the same frequency is proposed to document that these pollutants continue to remain at low levels.

1,2,4-Trichlorobenzene, 1,4-Dichlorobenzene, Arsenic, Barium, Bromodichloromethane, Chloroform, Iron, Molybdenum, Naphthalene, Selenium, Strontium, and Xylenes
The Ohio EPA risk assessment (Table 16) places these parameters in groups 2 and 3. This placement, as well as the data in Table 9 and Table 10, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed.

Flow, Water Temperature, and Winter Ammonia
Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

Total Filterable Residue
Based on best technical judgment, monitoring is proposed to continue at the same frequency for total filterable residue (total dissolved solids), which is an emerging water quality issue for municipal wastewater treatment plants. The purpose of the monitoring is to obtain data on the level and variability of total filterable residue in the effluent.

Nitrate + Nitrite and Total Kjeldahl Nitrogen
The *2018 Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Kokosing River watershed as impaired for aquatic life. Nutrients and organic enrichment/dissolved oxygen are listed as "high magnitude" causes, and major municipal point sources are listed among the "high magnitude" sources. Considering this information and the fact that municipal WWTPs discharge a nutrient load to the river, monthly monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed based on best technical judgment. Monitoring for phosphorus and nitrate + nitrite at the upstream and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in the future total maximum daily loads (TMDL) study.

Phosphorous
The *Biological and Water Quality Study of the Kokosing River and Selected Tributaries 2007* report indicates the Kokosing River is partially impaired for aquatic life use immediately downstream of the Mt. Vernon WWTP effluent discharge due to phosphorous enrichment in the river. No new limit is proposed for phosphorous for this permit renewal. However, a phosphorous optimization treatment system is proposed to be constructed at the Mt. Vernon WWTP, a schedule of compliance for the construction has been included in the permit, and monitoring is proposed to continue at the same frequency. See Part I,C of the permit for details.

Dissolved Orthophosphate
Monitoring for dissolved orthophosphate (as P) is required by Ohio Senate Bill 1 (ORC 6111.03), which was signed by the Governor on April 2, 2015. Monitoring for orthophosphate will further develop nutrient datasets for dissolved reactive phosphorus that are used in stream and watershed assessments and studies. Because Ohio EPA monitoring, as well as other in-stream monitoring, is taken by grab sample, grab samples are proposed for orthophosphate to maintain consistent data. The grab samples must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 11 and other pertinent data under the provisions of OAC 3745-33-07(B), the Mt. Vernon WWTP is placed in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). Annual chronic toxicity monitoring with the

determination of acute endpoints is proposed for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements
Monitoring for *E. coli* at monitoring stations 801 and 901 are proposed to continue at an increased frequency of once per two weeks in the months from June through August. This increased monitoring frequency is proposed to facilitate the detection of impairments.

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

Sludge
Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit.

OTHER REQUIREMENTS

Compliance Schedule
Pretreatment Local Limits Review - A 6 month compliance schedule is proposed for the City of Mount Vernon to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City of Mount Vernon must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

Phosphorous Optimization Treatment System – A compliance schedule totaling 48 months is proposed for the City of Mount Vernon to implement a phosphorous optimization treatment system that reduces total phosphorous concentrations in the Mt. Vernon WWTP final effluent discharge. The compliance schedule has incremental milestones including: beginning the treatment system design, design approval, PTI submission to OEPA, commence construction, complete construction, and implementation of the treatment system. Details are in Part I.C of the permit.

Clinton Road Pump Station Sanitary Sewer Overflow Elimination – A compliance schedule totaling 59 months is proposed for the City of Mount Vernon to eliminate SSO occurrences at the Clinton Road pump station. This pump station is the location of the majority of the SSO occurrences in the City of Mount Vernon's collection system. Details are in Part I.C of the permit.

Sanitary Sewer Overflow Reporting
Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the "Noncompliance Notification", "Records Retention", and "Facility Operation and Quality Control" general conditions in Part III of Ohio NPDES permits.

Operator Certification and Operator of Record
Operator certification requirements have been included in Part II of the permit in accordance with rules adopted in December 2006 (OAC 3745-7-02). These rules require the Mt. Vernon WWTP to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

Low-Level Free Cyanide Testing
Currently there are three approved methods for free cyanide listed in 40 CFR 136 that have a quantification level lower than water quality-based effluent limits:

- ASTM D7237-10, OIA-1677-09, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

These methods will allow Ohio EPA to make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

New NPDES permits no longer authorize the use of method 4500 CN-I from Standard Methods for free cyanide testing. The new permits require permittees to begin using one of these approved methods as soon as possible. If a permittee must use method 4500 CN-I during the transition to an approved method, they are instructed to report the results on their DMR and enter "Method 4500 CN-I" in the remarks section.

Method Detection Limit
Part II of the permit includes a condition requiring the Mt. Vernon WWTP to use laboratory analytical methods with an appropriate MDL.

Outfall Signage
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Kokosing River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Part III
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

Storm Water Compliance
To comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on April 1, 2019. The certification number is 4GRN01158*AG. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than April 1, 2024, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

Figure 1. Location of Mount Vernon WWTP

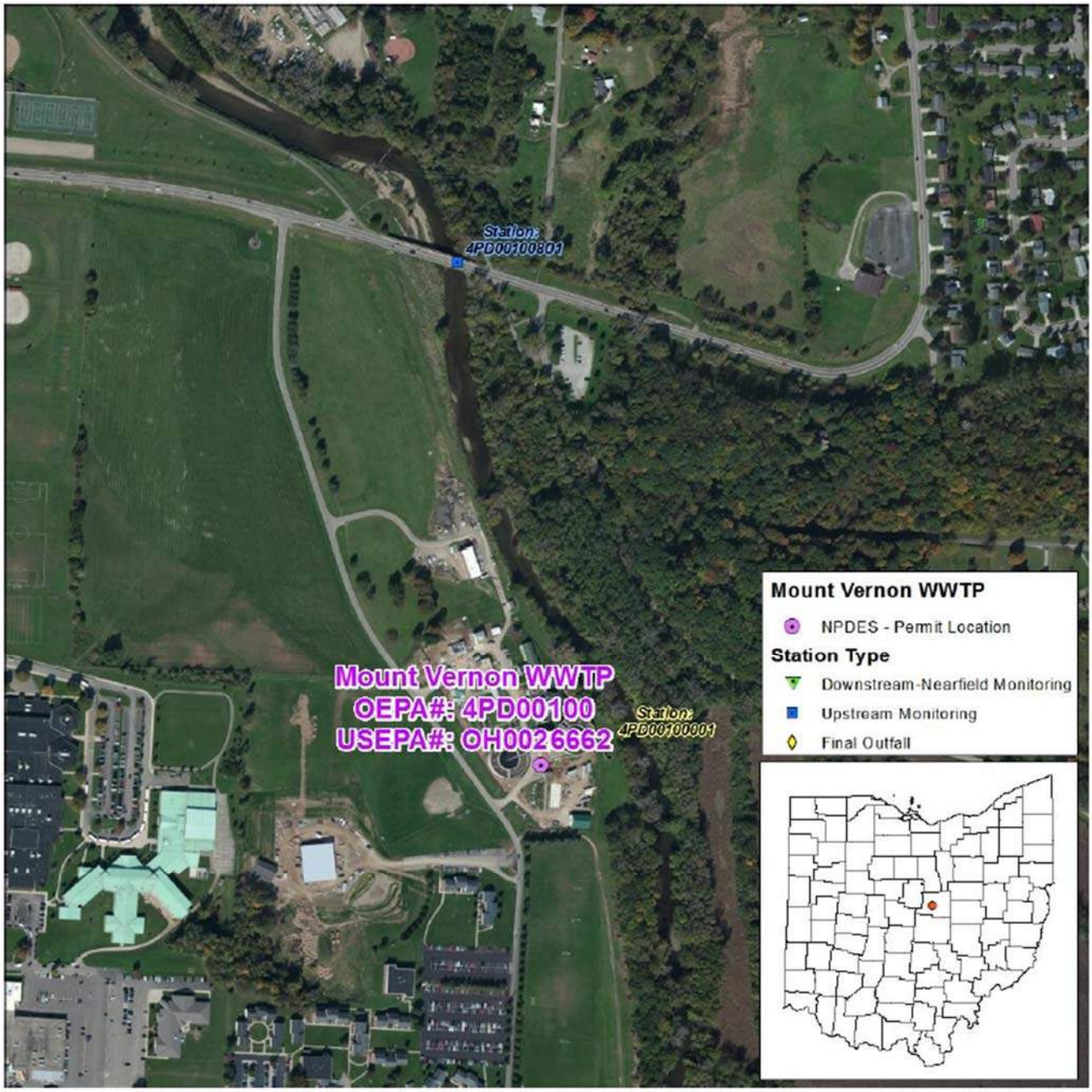


Figure 2. Diagram of Wastewater Treatment System

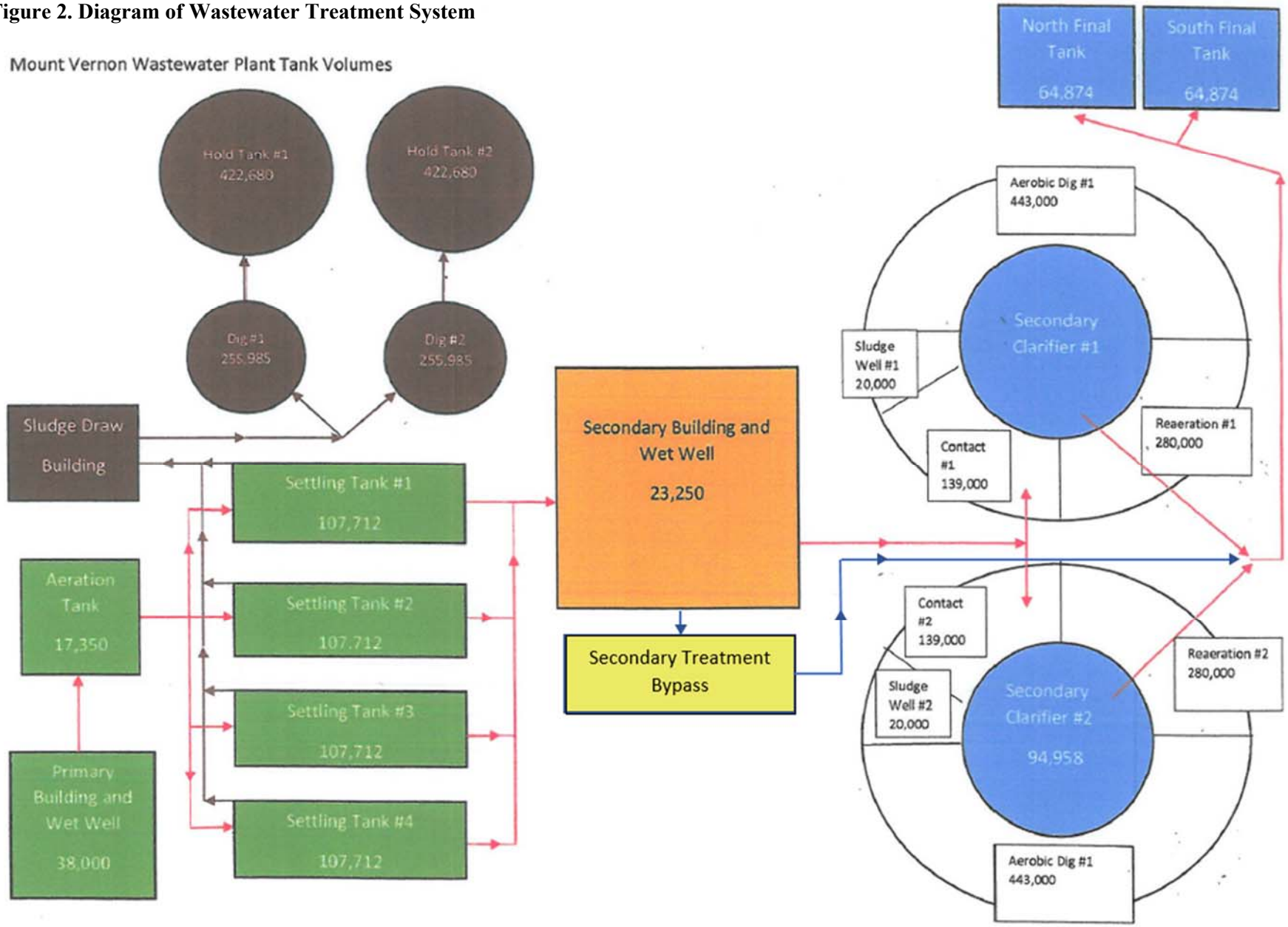


Table 1. Sewage Sludge Removal

Year	Dry Tons Removed
2014	269
2015	231
2016	200
2017	230
2018	186

Table 2. Effluent Violations for Outfall 001

Parameter	2014	2015	2016	2017	2018
Nitrogen, Ammonia	0	0	0	0	1
Oil and Grease	2	0	0	0	0
Total Suspended Solids	0	0	0	0	1
Total	2	0	0	0	2

Table 3. Average Annual Effluent Flow Rates

Year	Annual Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2014	2.43	5.28	15.9
2015	2.36	5.64	11.42
2016	2.31	4.02	7.23
2017	2.74	5.2	11.43
2018	2.96	7.03	13.88

MGD = million gallons per day.

Table 4. Sanitary Sewer Overflows Discharges

Year	Number
2014	10
2015	8
2016	5
2017	8
2018	11

Table 5. Bypass Discharges

Year	Days with Reported Bypass Flow	Bypass Volume (Million gallons)		Total Suspended Solids (mg/L)	Carbonaceous Biochemical Oxygen Demand (5 day)
		Median	Annual	Median	Median
2013	1	0.1	0.1	38	24
2014	2	2.3	4.6	37	25
2015	3	1.65	3.8	101	49
2017	1	0.95	0.95	25	18
2018	6	0.654	7.47	40	20

[a] = data set begins on 12/1/2013
[b] = data set ends on 11/31/2018

Table 6. Calculated Phosphorus Loadings from 2014 - 2018

Year	Median Flows for May through October	Median Daily P Concentration for May through October	Calculated Loading
	Flow (MGD)	Phosphorus (mg/L)	Loading (kg/day)
2014	2.112	3.04	25
2015	2.196	3.2	24.7
2016	1.9935	3.27	24.8
2017	2.355	2.875	26.3
2018	2.3865	2.76	26.4

MGD = million gallons per day

Table 7. Effluent Characterization Using Pretreatment Data

Parameter (ug/L)	8/5/2014	8/18/2015	8/30/2016	10/17/2017	9/6/2018
Acetone	NA	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	NA
Arsenic	AA (3)	AA (10.0)	AA (5.0)	AA (5.0)	AA (5.0)
Barium	NA	NA	NA	NA	NA
Bromodichloromethane / Dichlorobromomethane	AA (5.0)	AA (1.0)	AA (5.0)	AA (5.0)	AA (5.0)
Chloride	NA	NA	NA	NA	NA
Chloroform	AA5.0	2.1	AA (5.0)	AA (5.0)	AA (5.0)
Chromium	AA (10.0)	AA (10.0)	AA (7.0)	7	AA (7.0)
Copper	AA (10.0)	AA (10.0)	AA (8.0)	AA (8.0)	8
Cyanide	AA (5.0)	AA (3.0)	AA (10.0)	AA (10.0)	AA (10.0)
Dichlorobenzene, 1,4-	AA (5.0)	AA (5.0)	AA (5.0)	AA (5.0)	AA (5.0)
Iron	NA	NA	NA	NA	NA
Lead	AA (2.0)	AA (0.20)	AA (10.0)	AA (10.0)	AA (10.0)
Magnesium	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA
Mercury	AA (0.20)	AA (0.20)	AA (0.20)	0.00476	0.00476
Methyl chloride	AA (10.0)	AA (1.0)	AA (10.0)	AA (10.0)	AA (10.0)
Molybdenum	10	NA	AA (20)	AA (20)	AA (20)
Naphthalene	AA (10.0)	AA (5.0)	AA (10.0)	AA (10.0)	AA (10.0)
Nickel	AA (10.0)	AA (10.0)	AA (8.0)	AA (8.0)	AA (8.0)
Nitrate + Nitrite	NA	NA	NA	NA	NA
Selenium	AA (3.0)	AA (10.0)	AA (4.0)	AA (4.0)	AA (4.0)
Strontium	NA	NA	NA	NA	NA
Total Filterable Residue	NA	NA	NA	NA	NA
Trichlorobenzene, 1,2,3-	NA	NA	NA	NA	NA
Trichlorobenzene, 1,2,4-	AA (10.0)	AA (5.0)	AA (5.0)	AA (10.0)	AA (10.0)
Trihalomethanes (unspecified mix)	NA	NA	NA	NA	NA
Xylene, o- ; 1,2-Xylene	NA	NA	NA	NA	NA
Zinc	20	150	188	227	248

NA = not analyzed
AA = not-detected (analytical method detection limit)

Table 8. Effluent Characterization Using Ohio EPA data

Parameter	Units	10/24/2017	5/31/2018
Acetone	ug/L	3.35	4.08
Aluminum	ug/L	46.4139	AA (19.59)
Ammonia	mg/L	4.36	1.96
Arsenic	ug/L	1.24	1.27
Barium	ug/L	39.7	44.1
Benzyl Alcohol	ug/L	AA (160)	3.26
Bromodichloromethane / Dichlorobromomethane	ug/L	0.47	0.38
Chloride	mg/L	100	110
Chloroform	ug/L	1.17	1.05
Chromium	ug/L	0.5	AA (0.273)
Copper	ug/L	8.87	5.81
Cyanide	ug/L	5.58	6.16
Dichlorobenzene, 1,4-	ug/L	0.21	0.34
Iron	ug/L	172	91.2
Lead	ug/L	1.0	0.35
Magnesium	ug/L	21	19.1
Manganese	ug/L	17.9	10.7
Mercury	ug/L	AA (0.186)	AA (0.173)
Methyl chloride	ug/L	0.11	AA (0.49)
Molybdenum	ug/L	NA	NA
Naphthalene	ug/L	0.3	AA (0.49)
Nickel	ug/L	2.2	1.71
Nitrate + Nitrite	mg/L	24.2	16.2
Selenium	ug/L	1.0	0.98
Strontium	ug/L	549	482
Total Filterable Residue (mg/L)	mg/L	454	498
Trichlorobenzene, 1,2,3-	ug/L	0.19	AA (0.34)
Trichlorobenzene, 1,2,4-	ug/L	0.17	AA (0.49)
Trihalomethanes (unspecified mix)	ug/L	1.17	1.04
Xylene, o- ; 1,2-Xylene	ug/L	AA (0.12)	0.84
Zinc	ug/L	51.6	45.5

NA = not analyzed
AA = not-detected (analytical method detection limit)

Table 9. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
Outfall 001								
Water Temperature	Annual	°C	Monitoring Only		1888	16.9	22.3	8.83 - 24.4
Dissolved Oxygen	Annual	mg/L	--	5.0[m]	1888	8.28	7.2*	5.3 - 10.2
Total Suspended Solids	Summer	kg/day	284	435[w]	363	58	157	8.76 - 1020
Total Suspended Solids	Summer	mg/L	15	23[w]	363	7	13	1 - 37
Total Suspended Solids	Winter	kg/day	568	852[w]	384	106	307	6.65 - 1410
Total Suspended Solids	Winter	mg/L	30	45[w]	384	10	16	1 - 36
Oil and Grease	Annual	mg/L	--	10	125	< 5.9	< 5.9	0 - 33
Nitrogen, Ammonia	Summer	kg/day	76	114[w]	363	17.8	49.4	1.03 - 93
Nitrogen, Ammonia	Summer	mg/L	4.0	6.0[w]	363	2.03	4.03	.107 - 5.77
Nitrogen, Ammonia	Winter	mg/L	Monitoring Only		384	2.73	5.33	.31 - 10.5
Nitrogen Kjeldahl, Total	Annual	mg/L	Monitoring Only		68	4.31	6.93	1.6 - 10.3
Nitrite Plus Nitrate, Total	Annual	mg/L	Monitoring Only		68	15.2	25.9	5.86 - 28.9
Phosphorus, Total	Annual	mg/L	Monitoring Only		259	2.6	3.7	.51 - 4.05
Orthophosphate, Dissolved	Annual	mg/L	Monitoring Only		30	2.02	3.65	.36 - 4.21
Cyanide, Free	Annual	µg/L	Monitoring Only		21	--	--	< 3
Nickel, TR	Annual	µg/L	Monitoring Only		21	--	--	< 10
Zinc, TR	Annual	µg/L	Monitoring Only		21	140	530	110 - 1300
Cadmium, TR	Annual	µg/L	Monitoring Only		21	--	--	< .5
Lead, TR	Annual	µg/L	Monitoring Only		21	< 2	3.9	0 - 6.4
Chromium, TR	Annual	µg/L	Monitoring Only		21	--	--	< 10
Copper, TR	Annual	µg/L	Monitoring Only		21	< 10	12	0 - 13
Chromium, Dissolved Hexavalent	Annual	µg/L	Monitoring Only		21	< 10	< 10	0 - 4.6
Fecal Coliform	Summer	#/100 mL	1000	2000[w]	144	26	365	0 - 3600
E. coli	Summer	#/100 mL	126	284[w]	294	13	131	0 - 1100
Flow Rate	Annual	MGD	Monitoring Only		1888	2.59	5.64	.632 - 15.9

Parameter	Season	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
Chlorine, Total Residual	Summer	mg/L	--	0.038	643	< .01	< .01	0 - .029
Mercury, Total	Annual	kg/day	0.000227	0.0322	16	.0000314	.0000742	.00001 - .00009
Mercury, Total - 2013-2015	Annual	ng/L	12	1700	16	3.13	8.8	1.87 - 14.6
Mercury, Total - 2015-2019	Annual	ng/L	Monitoring Only		48	4.04	9.37	1.7 - 11.9
Acute Toxicity, Ceriodaphnia dubia	July	TUa	Monitoring Only		5	--	--	< .2
Chronic Toxicity, Ceriodaphnia dubia	July	TUc	Monitoring Only		5	< 1	1.08	0 - 1.1
Acute Toxicity, Pimephales promelas	July	TUa	Monitoring Only		5	< .2	.78	0 - .9
Chronic Toxicity, Pimephales promelas	July	TUc	Monitoring Only		5	1	1.18	0 - 1.2
pH, Maximum	Annual	S.U.	--	9.0	1888	7.4	7.6	7.01 - 8.32
pH, Minimum	Annual	S.U.	--	6.5[m]	1888	7.25	7.03*	6.57 - 7.98
Residue, Total Filterable	Annual	mg/L	Monitoring Only		15	460	497	390 - 500
CBOD 5 day	Summer	kg/day	284	435[w]	361	44	108	6.92 - 413
CBOD 5 day	Summer	mg/L	15	23[w]	361	5	9	1 - 19
CBOD 5 day	Winter	kg/day	473	757[w]	384	68.7	180	17.1 - 471
CBOD 5 day	Winter	mg/L	25	40[w]	384	6	10	2 - 20
Outfall 300								
Overflow Occurrence	Annual	No./Month	Monitoring Only		18	1	6.3	1 - 8
Outfall 581								
Ammonia (NH3) In Sludge	Annual	mg/kg	Monitoring Only		15	15500	19800	10200 - 22300
Nitrogen Kjeldahl	Annual	mg/kg	Monitoring Only		15	47700	68300	43600 - 70000
Nitrite Plus Nitrate	Annual	mg/kg	Monitoring Only		15	102	107	0 - 118
Phosphorus	Annual	mg/kg	Monitoring Only		4	15100	16100	10400 - 16100
Potassium In Sludge	Annual	mg/kg	Monitoring Only		4	3050	3290	2540 - 3330
Arsenic	Annual	mg/kg	--	75	15	< 35	13.3	0 - 21
Cadmium	Annual	mg/kg	--	85	15	< 5.75	3.16	0 - 3.52
Copper	Annual	mg/kg	--	4300	15	552	642	439 - 694
Lead	Annual	mg/kg	--	840	15	61	63.7	0 - 65.2
Nickel	Annual	mg/kg	--	420	15	20.6	24.5	0 - 28.6

Parameter	Season	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
Zinc	Annual	mg/kg	--	7500	15	888	1280	753 - 1620
Selenium	Annual	mg/kg	--	100	15	< 35	9.19	0 - 9.2
Sludge Fee Weight	Annual	dry tons	Monitoring Only		19	37.4	552	3.3 - 552
Fecal Coliform in Sludge	Annual	CFU/gram	--	2000000	15	8600	79400	0 - 91600
Sludge Weight	Annual	Dry Tons	Monitoring Only		19	37.4	230	3.3 - 231
Mercury	Annual	mg/kg	--	57	15	1.2	20.6	0 - 20.6
Molybdenum In Sludge	Annual	mg/kg	--	75	15	31	888	0 - 888
Outfall 586								
Sludge Fee Weight	Annual	dry tons	Monitoring Only		4	239	292	143 - 296
Outfall 601								
pH	Annual	S.U.	Monitoring Only		1888	7.49	7.69	4.48 - 8.57
Total Suspended Solids	Annual	mg/L	Monitoring Only		747	164	336	32 - 1260
Cyanide, Total	Annual	µg/L	Monitoring Only		21	< 5	< 5	0 - 12
Nickel, TR	Annual	µg/L	Monitoring Only		21	--	--	< 10
Zinc, TR	Annual	µg/L	Monitoring Only		21	160	393	85 - 890
Cadmium, TR	Annual	µg/L	Monitoring Only		21	< .5	< .5	0 - .75
Lead, TR	Annual	µg/L	Monitoring Only		21	< 2	5	0 - 8.8
Chromium, TR	Annual	µg/L	Monitoring Only		21	--	--	< 10
Copper, TR	Annual	µg/L	Monitoring Only		21	21	175	0 - 180
Chromium, Dissolved Hexavalent	Annual	µg/L	Monitoring Only		21	--	--	< 10
Mercury, Total	Annual	ng/L	Monitoring Only		62	27.2	208	5.6 - 3090
CBOD 5 day	Annual	mg/L	Monitoring Only		744	155	240	0 - 390
Outfall 602								
Bypass Total Hours Per Day	Annual	Hrs/Day	Monitoring Only		13	15.7	27.6	4.33 - 28.5
Total Suspended Solids	Annual	mg/L	Monitoring Only		13	40	108	6 - 118
Bypass Volume	Annual	MGAL	Monitoring Only		13	.771	3.8	.1 - 4.1
CBOD 5 day	Annual	mg/L	Monitoring Only		13	24	53	0 - 59
Bypass Occurrence, Number per month	Annual	No./Month	Monitoring Only		13	1	1.4	1 - 2

Parameter	Season	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
Outfall 801								
Water Temperature	Annual	°C	Monitoring Only		72	14.3	22.1	2.71 - 22.8
Dissolved Oxygen	Annual	mg/L	Monitoring Only		72	9.05	7.01*	6.36 - 14
pH	Annual	S.U.	Monitoring Only		72	7.99	8.11	7.81 - 8.14
Nitrogen, Ammonia	Annual	mg/L	Monitoring Only		66	.0285	.0798	0 - .2
Nitrite Plus Nitrate, Total	Annual	mg/L	Monitoring Only		63	1.29	1.99	0 - 3.55
Phosphorus, Total	Annual	mg/L	Monitoring Only		64	.01	.119	0 - .19
Fecal Coliform	Annual	#/100 mL	Monitoring Only		6	250	613	75 - 670
E. coli	Summer	#/100 mL	Monitoring Only		31	250	1150	75 - 1400
48-Hr. Acute Toxicity Ceriodaphnia dubia	July	% Affected	Monitoring Only		5	--	--	< 10
96-Hr. Acute Toxicity Pimephales promela	July	% Affected	Monitoring Only		5	2	4.5	0 - 5
7-Day Chronic Toxicity Ceriodaphnia dubia	July	% Affected	Monitoring Only		5	--	--	< 10
7-Day Chronic Toxicity Pimephales promelas	July	% Affected	Monitoring Only		5	5	11.6	2.5 - 12.5
Outfall 901								
Water Temperature	Annual	°C	Monitoring Only		72	14.4	21.9	2.8 - 22.8
Dissolved Oxygen	Annual	mg/L	Monitoring Only		72	8.9	6.4*	6.24 - 14
pH	Annual	S.U.	Monitoring Only		72	7.97	8.07	7.05 - 8.13
Nitrogen, Ammonia	Annual	mg/L	Monitoring Only		66	.04	.16	0 - .2
Nitrite Plus Nitrate, Total	Annual	mg/L	Monitoring Only		63	1.6	2.2	1.2 - 3.85
Phosphorus, Total	Annual	mg/L	Monitoring Only		67	.08	.21	0 - .25
Hardness, Total (CaCO3)	Annual	mg/L	Monitoring Only		65	237	269	145 - 280
Fecal Coliform	Annual	#/100 mL	Monitoring Only		6	260	435	100 - 440
E. coli	Summer	#/100 mL	Monitoring Only		31	250	900	28 - 1400

* = For minimum pH and dissolved oxygen, 5th percentile shown in place of 95th percentile.
TR = Total Recoverable
^{w} = Weekly Average
^{m} = Minimum Limit

Table 10. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/L	2	1	128.75	176.37
Ammonia (Summer)	mg/L	243	243	3.03	5.61
Ammonia (Winter)	mg/L	180	180	4.17	8.38
Arsenic - TR	µg/L	2	2	3.52	4.83
Barium	µg/L	2	2	122.33	167.58
Bromodichloromethane	µg/L	2	2	1.3	1.78
Cadmium - TR	µg/L	20	0	--	--
Chlorides	mg/L	2	2	305.14	418
Chlorine, Total Residual	mg/L	643	8	0.003	0.005
Chloroform (Trichloromethane)	µg/L	3	3	4.6	6.3
Chromium - TR	µg/L	2	1	1.39	1.9
Hexavalent Chromium (Dissolved)	µg/L	11	1	5.71	7.82
Copper - TR	µg/L	26	7	9.96	15.56
Cyanide, Free	µg/L	24	2	5.85	8.0
1,4-Dichlorobenzene	µg/L	2	2	0.93	1.28
Dissolved solids (max)	mg/L	16	16	492.85	530.65
Iron - TR	µg/L	2	2	477.13	653.6
Lead - TR	µg/L	18	5	3.99	5.46
Magnesium	mg/L	2	2	58.25	79.8
Manganese - TR	µg/L	2	2	49.65	68.02
Mercury	ng/L	64	64	6.72	9.49
Molybdenum	µg/L	4	1	37.96	52
Naphthalene	µg/L	1	1	1.34	1.84
Nickel - TR	µg/L	2	2	6.1	8.36
Nitrate-N + Nitrite-N	mg/L	72	68	23.65	32.55
Selenium - TR	µg/L	2	2	2.76	3.78
Strontium	µg/L	2	2	1522.93	2086.2
1,2,4-Trichlorobenzene	µg/L	1	1	0.78	1.07
Zinc - TR	µg/L	25	25	228	323.7
Xylenes	µg/L	7	1	1.23	1.68

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 11. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	TU_a	TU_c	TU_a	TU_c
7/22/2014	AA (0.2)	1	AA (0.2)	AA (1.0)
7/10/2015	AA (0.2)	AA (1.0)	.3	1
7/12/2016	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
7/18/2017	AA (0.2)	AA (1.0)	.9	1.2
7/20/2018	AA (0.2)	1.1	AA (0.2)	1.1

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

Table 12. Use Attainment Table

Location	River Mile	Use	Status	Causes	Sources
Kokosing River	28.6/28.7	EWH	Full		
Kokosing River	25.3/25.1	EWH	Full		
Kokosing River	24.3/24.5	EWH	Partial	Nutrient*	Municipal Point Source Discharge
Kokosing River	20.9/22.1	EWH	Full		

Nutrient* = nutrient/eutrophication, phosphorous
EWH = exceptional warmwater habitat

Table 13. Water Quality Criteria in the Study Area

		Outside Mixing Zone Criteria				Inside
		Average			Maximum	Mixing
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Zone Maximum
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/L	--	--	1.2	--	--
Ammonia (Winter)	mg/L	--	--	3	--	--
Arsenic - TR	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Bromodichloromethane	µg/L	460[c]	--	--	--	--
Cadmium - TR	µg/L	--	50	4.9	12	24
Chlorides	mg/L	--	--	--	--	--
Chlorine, Total Residual	mg/L	--	--	0.011	0.019	0.038
Chloroform (Trichloromethane)	µg/L	4700[c]	--	140	1300	2600
Chromium - TR	µg/L	--	100	180	3700	7400
Hexavalent Chromium (Dissolved)	µg/L	--	--	11	16	31
Copper - TR	µg/L	1300	500	20	32	64
Cyanide, Free	µg/L	220000	--	12	46	92
1,4-Dichlorobenzene	µg/L	2600	--	9.4	57	110
Dissolved solids (max)	mg/L	--	--	1500	--	--
Iron - TR	µg/L	--	5000	--	--	--
Lead - TR	µg/L	--	100	20	380	750
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	20000	190000	370000
Naphthalene	µg/L	--	--	21	170	340
Nickel - TR	µg/L	4600	200	110	990	2000
Nitrate-N + Nitrite-N	mg/L	--	100	--	--	--
Selenium - TR	µg/L	11000	50	5	--	--
Strontium	µg/L	--	--	21000	40000	81000
1,2,4-Trichlorobenzene	µg/L	940	--	--	--	--
Zinc - TR	µg/L	69000	25000	250	250	510
Xylenes	µg/L	--	--	27	240	480

[c] = carcinogen

Table 14. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	18.16	USGS Station Number 03136500*
		annual	20.75	USGS Station Number 03136500*
7Q10	cfs	summer	0	
		winter	0	
30Q10	cfs	summer	24.64	USGS Station Number 03136500*
		winter	50.58	USGS Station Number 03136500*
90Q10	cfs	annual	0	
Harmonic Mean	cfs	annual	94.68	USGS Station Number 03136500*
Mixing Assumption	%	average	100	
		maximum	100	
Hardness, OMZ	mg/L	annual	242	Outfall 901; 12/2013 to 11/2018; Median
Hardness, IMZ	mg/L	annual	242	Outfall 901; 12/2013 to 11/2018; Median
pH	S.U.	summer	7.9775	Outfall 901; 12/2013 to 11/2018; 75th Percentile
		winter	8.065	Outfall 901; 12/2013 to 11/2018; 75th Percentile
Temperature	°C	summer	21.483	Outfall 901; 12/2013 to 11/2018; 75th Percentile
		winter	9.385	Outfall 901; 12/2013 to 11/2018; 75th Percentile
Mount Vernon WWTP flow	cfs	annual	7.7361	Permit Application and Existing Permit
Background Water Quality				
Aluminum	µg/L		220.6	MS; 2007; n=5; 4<MDL;; Mean
Ammonia (Summer)	mg/L		0.023	MV801; 2013-2018; n=24; 3<MDL; Median
Ammonia (Winter)	mg/L		0.03	MV801; 2013-2018; n=15; 2<MDL; Median
Arsenic - TR	µg/L		2.02	MS; 2007; n=5; 1<MDL; Mean
Barium	µg/L		91	MS; 2007; n=5; 0<MDL; Mean
Bromodichloromethane	µg/L			No representative data available.
Cadmium - TR	µg/L		0	MS; 2007; n=5; 5<MDL; Mean
Chlorides	mg/L		27.8	MS; 2007; n=5; 0<MDL; Mean
Chlorine, Total Residual	mg/L			No representative data available.
Chloroform (Trichloromethane)	µg/L			No representative data available.
Chromium - TR	µg/L		0	MS; 2007; n=5; 5<MDL; Mean
Hexavalent Chromium (Dissolved)	µg/L			No representative data available.
Copper - TR	µg/L		0	MS; 2007; n=5; 5<MDL; Mean
Cyanide, Free	µg/L			No representative data available.
1,4-Dichlorobenzene	µg/L			No representative data available.
Dissolved solids (max)	mg/L		313.6	MS; 2007; n=5; 0<MDL; Mean
Iron - TR	µg/L		468.2	MS; 2007; n=5; 0<MDL; Mean
Lead - TR	µg/L		2.04	MS; 2007; n=5; 4<MDL; Mean
Magnesium	mg/L		22	MS; 2007; n=5; 0<MDL; Mean
Manganese - TR	µg/L		57.8	MS; 2007; n=5; 0<MDL; Mean
Mercury	ng/L		0	MS; 2007; n=5; 5<MDL; Mean

Parameter	Units	Season	Value	Basis
Molybdenum	µg/L			No representative data available.
Naphthalene	µg/L			No representative data available.
Nickel - TR	µg/L		0	MS; 2007; n=5; 5<MDL; Mean
Nitrate-N + Nitrite-N	mg/L		1.2	MV801; 2013-2018; n=61; 1<MDL; Median
Selenium - TR	µg/L		0	MS; 2007; n=5; 5<MDL; Mean
Strontium	µg/L		363.8	MS; 2007; n=5; 1<MDL; Mean
1,2,4-Trichlorobenzene	µg/L			No representative data available.
Zinc - TR	µg/L		6	MS; 2007; n=5; 4<MDL; Mean
Xylenes	µg/L			No representative data available.

MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System
Ohio EPA = Ohio Environmental Protection Agency
WWTP = wastewater treatment plant
* = Kokosing River at Mt Vernon + Low Flow Calc Spreadsheet
MS = Monitoring Station R12K14
MV801 = Mount Vernon WWTP Upstream Monitoring Station 801
WWTP = wastewater treatment plant

Table 15. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

		Outside Mixing Zone Criteria				Inside
		Average			Maximum	Mixing
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Zone Maximum
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/L	--	--	4.95	--	--
Ammonia (Winter)	mg/L	--	--	22.42	--	--
Arsenic - TR	µg/L	--	1299	547	1133	680
Barium	µg/L	--	--	566	6481	4000
Bromodichloromethane	µg/L	6090	--	--	--	--
Cadmium - TR	µg/L	--	662	18	40	24
Chlorides	mg/L	--	--	--	--	--
Chlorine, Total Residual	mg/L	--	--	0.041	0.064	0.038
Chloroform (Trichloromethane)	µg/L	62222	--	516	4352	2600
Chromium - TR	µg/L	--	1324	663	12386	7400
Hexavalent Chromium (Dissolved)	µg/L	--	--	41	54	31
Copper - TR	µg/L	17210	6619	74	107	64
Cyanide, Free	µg/L	2913000	--	44	150	92
1,4-Dichlorobenzene	µg/L	34421	--	35	191	110
Dissolved solids (max)	mg/L	--	--	4682	--	--
Iron - TR	µg/L	--	60463	--	--	--
Lead - TR	µg/L	--	1299	68	1267	750
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	73645	636013	370000
Naphthalene	µg/L	--	--	77	569	340
Nickel - TR	µg/L	60898	2648	405	3314	2000
Nitrate-N + Nitrite-N	mg/L	--	1309	--	--	--
Selenium - TR	µg/L	145626	662	18	--	--
Strontium	µg/L	--	--	76351	133043	81000
1,2,4-Trichlorobenzene	µg/L	12444	--	--	--	--
Zinc - TR	µg/L	913399	330895	904	823	510
Xylenes	µg/L	--	--	99	803	480

Table 16. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

Aluminum	Chlorides	Magnesium
Manganese - TR	Ammonia (Summer)	

Group 2: PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

Arsenic - TR	Bromodichloromethane	Cadmium - TR
Chloroform (Trichloromethane)	Chromium - TR	1,4-Dichlorobenzene
Iron - TR	Lead - TR	Molybdenum
Naphthalene	Nickel - TR	Nitrate-N + Nitrite-N
Strontium	1,2,4-Trichlorobenzene	Xylenes

Group 3: PEQmax < 50 percent of maximum PEL and PEQavg < 50 percent of average PEL.
No limit recommended; monitoring optional.

Ammonia (Winter)	Barium	Chlorine, Total Residual
Hexavalent Chromium (Dissolved)	Copper - TR	Cyanide, Free
Dissolved solids (max)	Selenium - TR	

Group 4: PEQmax >= 50 percent, but < 100 percent of the maximum PEL or
PEQavg >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Mercury	Zinc - TR

Group 5: Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

Table 17. Final Effluent Limits for Outfall 001

		Concentration		Loading (kg/day)[a]		
		30 Day	Daily	30 Day	Daily	
Parameter	Units	Average	Maximum	Average	Maximum	Basis[b]
Water Temperature	°C	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Dissolved Oxygen	mg/l	--	5.0[e]	--	--	M[c]
Total Suspended Solids						
Summer	mg/l	15	23[d]	284	436[d]	PD
Winter	mg/l	30	45[d]	568	852[d]	BPT
Oil & Grease	mg/l	--	10	--	--	WQS
Nitrogen, Ammonia						
Summer	mg/l	4	6[d]	76	114[d]	PD
Winter	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Kjeldahl Nitrogen, Total	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Nitrate+Nitrite, Total	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Phosphorus, Total (P)	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Orthophosphate, Dissolved (as P)	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		SB1
Cyanide, Free	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Nickel, TR	ug/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Zinc, TR	ug/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		RP
Cadmium, TR	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Lead, TR	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Chromium, TR	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Copper, TR	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
Chromium, Dissolved Hexavalent	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ
E. coli	#/100 ml	126	284[d]	--	--	WQS
Flow Rate	MGD	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		M[c]
Chlorine, Total Residual	mg/l	--	0.038	--	--	WQS
Mercury, Total (Low Level)	ng/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		RP
Acute Toxicity, *Ceriodaphnia dubia*	TU_a	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET
Chronic Toxicity, *Ceriodaphnia dubia*	TU_c	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET
Acute Toxicity, *Pimephales promelas*	TU_a	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET
Chronic Toxicity, *Pimephales promelas*	TU_c	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		WET
pH, Maximum	S.U.	--	9.0	--	--	WQS
pH, Minimum	S.U.	--	6.5[e]	--	--	WQS
Residue, Total Filterable	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - -		BTJ

		Concentration		Loading (kg/day)[a]		
		30 Day	Daily	30 Day	Daily	
Parameter	Units	Average	Maximum	Average	Maximum	Basis[b]
CBOD 5 day						
Summer	mg/l	15	23[d]	284	436[d]	PD
Winter	mg/l	25	40[d]	474	757[d]	BPT

[a] Effluent loadings based on average design discharge flow of 5.0 MGD.

[b] Definitions:

BPT = Best Practicable Technology
BTJ = Best Technical Judgment
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
SB1 = Implementation of Senate Bill 1 (ORC 6111.03)
TR = Total Recoverable
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.

[e] Daily minimum

Addendum 1. Acronyms

ABS	Anti-backsliding
BPJ	Best professional judgment
CFR	Code of Federal Regulations
CMOM	Capacity Management, Operation, and Maintenance
CONSWLA	Conservative substance wasteload allocation
CSO	Combined sewer overflow
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
IMZM	Inside mixing zone maximum
LTCP	Long-term Control Plan
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SSO	Sanitary sewer overflow
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WPCF	Water Pollution Control Facility
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

CITY OF MOUNT VERNON
Debt Service Analysis
Wastewater Operations

GO VP Refunding Bonds (2003), Series 2012 W/W

Delano Run , Refunder 1992, 3 N. Gay Street

	Principal	Interest
2021	206,000	7,860
2022	208,575	3,955
	414,575	11,815

GO VP Refunding Bonds (2009), Series 2015 W/W

Former BAB's - Religning Project

	Principal	Interest
2021	135,000	35,496
2022	140,000	31,973
2023	145,000	28,319
2024	145,000	24,534
2025	150,000	20,750
2026	155,000	16,835
2027	160,000	12,789
2028	165,000	8,613
2029	165000	4,307
	1,360,000	183,614

OWDA W/WATER PLANT UPGRADES - 2013

Wastewater Treatment Plant Upgrades

	Principal	Interest
2021	351,965	51235
2022	356,060	47141
2023	360,202	42,999
2024	364,393	38808
2025	368,632	34569
2026	372,921	30280
2027	377,259	25942
2028	381,648	21553
2029	386,088	17113
2030	390,580	12621
2031	395,123	8078
2032	399,720	3481
	4,504,591	333,820

LTGO VP Refunding Bonds, Series 2015 (W/W)

(Former VP2007 Bar Rack & Blowers

	Principal	Interest
2021	180,000	33,885
2022	184,500	29,367
2023	186,750	24,736
2024	195,750	20,049
2025	195,750	15,135
2026	202,500	10,222
2027	204,750	5,139
	1,350,000	138,533

LTSpecial Obligation Tax Bonds, Series 2012 (W/W)

Maintenance Facility Building

	Principal	Interest
2021	60,000	11,895
2022	62,500	10,335
2023	63,750	8,710
2024	65,000	7,072
2025	67,500	5,362
2026	68,750	3,608
2027	70,000	1,820
	457,500	48,802

GRAND TOTALS

	Principal	Interest
2021	932,965	140,371
2022	951,635	122,770
2023	755,702	104,764
2024	770,143	90,463
2025	781,882	75,816
2026	799,171	60,945
2027	812,009	45,690
2028	546,648	30,166
2029	551,088	21,420
2030	390,580	12,621
2031	395,123	8,078
2032	399,720	3,481
Totals:	8,086,666	716,583

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.1100.51111	COUNCIL PRESIDEN	$ 67,024.00	$ 7,447.20	$ 67,024.00	$ 0.00	$ 0.00	$ 0.00	0%
101.1100.53111	DUES/SUPPLIES/IN	2,108.25	99.54	813.32	1,294.93	44.54	1,250.39	61.4%
101.1100.53112	SECURITY	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1100.54311	TRAINING/TRAVEL/	1,500.00	0.00	1,145.00	355.00	0.00	355.00	23.7%
101.1100.54451	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1200.51111	MAYOR SALARY	70,557.00	7,839.66	70,557.00	0.00	0.00	0.00	0%
101.1200.51112	MAYORS ADMIN ASS	51,500.00	5,748.24	51,467.96	32.04	0.00	32.04	0.1%
101.1200.53111	DUES/SUPPLIES/IN	4,188.25	97.55	3,544.23	644.02	74.54	569.48	15.4%
101.1200.53113	TELEPHONE	1,306.00	92.40	820.66	485.34	10.00	475.34	37.2%
101.1200.54311	TRAINING/TRAVEL/	534.00	0.00	134.00	400.00	0.00	400.00	74.9%
101.1200.54451	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1200.54465	REFUND OVERPAYME	291.00	0.00	0.00	291.00	0.00	291.00	100%
101.1300.51111	AUDITOR SALARY	70,398.00	7,821.99	70,382.10	15.90	0.00	15.90	0%
101.1300.51112	AUDITORS DEPUTY	103,000.00	12,572.58	100,775.23	2,224.77	0.00	2,224.77	2.2%
101.1300.52121	P E R S (GENERAL	145,000.00	8,841.01	115,389.69	29,610.31	10,800.00	18,810.31	20.4%
101.1300.53111	DUES/SUPPLIES/IN	23,280.25	651.83	10,788.96	12,491.29	2,354.54	10,136.75	53.7%
101.1300.53112	BANK CHARGES	10,000.00	660.22	7,925.82	2,074.18	0.00	2,074.18	20.7%
101.1300.53113	TELEPHONE	2,315.00	187.79	1,992.09	322.91	15.00	307.91	13.9%
101.1300.53217	O M L LEAGUE DUE	2,500.00	0.00	2,270.00	230.00	0.00	230.00	9.2%
101.1300.54111	SERVICES RECEIVE	9,250.00	0.00	6,572.50	2,677.50	0.00	2,677.50	28.9%
101.1300.54311	TRAINING/TRAVEL/	500.00	0.00	0.00	500.00	0.00	500.00	100%
101.1300.54451	COMPUTER MAINTEN	12,000.00	8,678.71	9,243.71	2,756.29	1,500.00	1,256.29	23%
101.1300.54467	ANNUAL REPORT	500.00	0.00	460.00	40.00	0.00	40.00	8%
101.1300.54484	TRANSFER TO BOND	40,000.00	3,125.00	24,241.88	15,758.12	0.00	15,758.12	39.4%
101.1400.51111	TREASURERS SALAR	8,888.00	987.54	8,888.00	0.00	0.00	0.00	0%
101.1400.53111	DUES/SUPPLIES/IN	300.00	0.00	50.00	250.00	0.00	250.00	83.3%
101.1500.51111	LAW DIRECTORS SA	104,899.00	11,655.45	104,899.00	0.00	0.00	0.00	0%
101.1500.51112	LAW DIRECTOR CLE	245,651.00	25,041.08	215,605.09	30,045.91	0.00	30,045.91	12.2%
101.1500.53111	DUES/SUPPLIES/IN	7,555.00	263.97	4,038.23	3,516.77	225.00	3,291.77	46.5%
101.1500.53113	TELEPHONE	2,290.00	178.03	2,037.07	252.93	10.00	242.93	11%
101.1500.53114	LAW BOOKS	4,500.00	294.12	3,984.25	515.75	0.00	515.75	11.5%
101.1500.53216	FURTHERANCE OF J	3,535.00	1,047.00	1,346.31	2,188.69	2,050.00	138.69	61.9%
101.1500.54111	OTHER LEGAL DUTI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1500.54311	TRAINING/TRAVEL/	2,000.00	244.00	319.00	1,681.00	0.00	1,681.00	84.1%
101.1500.54422	INSURANCE DEFENS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1500.54451	COMPUTERIZATION	11,000.00	0.00	6,884.25	4,115.75	0.00	4,115.75	37.4%
101.1510.51111	PERSONNEL	82,154.68	5,700.00	45,863.32	36,291.36	0.00	36,291.36	44.2%
101.1510.52121	P E R S	9,142.89	532.00	6,054.43	3,088.46	532.00	2,556.46	33.8%
101.1510.52123	WORKERS COMPENSA	257.12	0.00	257.12	0.00	0.00	0.00	0%
101.1510.52125	EMPLOYEE INSURAN	17,660.02	0.00	17,660.02	0.00	0.00	0.00	0%
101.1510.52126	MEDICARE & SOCIA	1,172.04	78.08	612.84	559.20	0.00	559.20	47.7%
101.1510.53111	DUES/SUPPLIES/IN	1,584.08	0.00	1,584.08	0.00	0.00	0.00	0%
101.1510.53113	TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1510.54111	SOCIAL PROGRAMS	1,000.00	0.00	1,000.00	0.00	0.00	0.00	0%
101.1510.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1510.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1600.51111	INCOME TAX ADMIN	66,420.00	7,399.56	66,368.40	51.60	0.00	51.60	0.1%
101.1600.51112	DEPUTY AND EMPLO	93,975.00	9,832.87	93,803.95	171.05	0.00	171.05	0.2%
101.1600.53111	DUES/SUPPLIES/IN	22,901.00	911.22	15,651.82	7,249.18	2,886.04	4,363.14	31.7%
101.1600.53113	TELEPHONE	2,512.50	211.65	2,280.89	231.61	12.50	219.11	9.2%
101.1600.54311	TRAINING/TRAVEL/	700.00	0.00	51.00	649.00	0.00	649.00	92.7%
101.1600.54451	COMPUTER MAINTEN	22,000.00	16,646.42	17,151.83	4,848.17	0.00	4,848.17	22%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.1600.54465	INCOME TAX REFUN	196,543.82	2,004.38	192,172.74	4,371.08	0.00	4,371.08	2.2%
101.1600.55511	INCOME TAX EQUIP	10,200.00	0.00	8,599.21	1,600.79	1,600.00	0.79	15.7%
101.1700.51111	MUNICIPAL COURT	38,987.40	4,216.65	38,987.40	0.00	0.00	0.00	0%
101.1700.51112	MUNICIPAL COURT	39,949.00	2,765.00	38,087.57	1,861.43	0.00	1,861.43	4.7%
101.1700.51113	MUNICIPAL COURT	241,825.00	22,773.41	241,749.87	75.13	0.00	75.13	0%
101.1700.51114	DISPUTE MEDIATIO	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1700.51115	MUNICIPAL COURT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1700.52121	MUNICIPAL COURT	87,000.00	5,760.72	77,608.17	9,391.83	5,618.77	3,773.06	10.8%
101.1700.53111	DUES/SUPPLIES/IN	35,704.00	1,780.74	28,039.53	7,664.47	3,837.64	3,826.83	21.5%
101.1700.53112	BANK CHARGES	1,000.00	50.00	600.00	400.00	0.00	400.00	40%
101.1700.53113	TELEPHONE	4,564.60	391.10	4,485.51	79.09	17.50	61.59	1.7%
101.1700.53114	LAW LIBRARY	1,500.00	0.00	0.00	1,500.00	788.00	712.00	100%
101.1700.54112	MERIT DRUG COURT	965.83	0.00	752.96	212.87	0.00	212.87	22%
101.1700.54113	YOUTH ASSISTANCE	1,645.29	0.00	0.00	1,645.29	0.00	1,645.29	100%
101.1700.54311	TRAINING/TRAVEL/	1,550.00	0.00	40.14	1,509.86	0.00	1,509.86	97.4%
101.1700.54451	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1720.51111	MUNICIPAL COURT	23,830.00	2,656.80	23,827.68	2.32	0.00	2.32	0%
101.1720.51112	MUNICIPAL COURT	64,689.00	7,595.00	64,417.85	271.15	0.00	271.15	0.4%
101.1720.52127	BAILIFF UNIFORM	1,200.00	45.00	697.44	502.56	160.00	342.56	41.9%
101.1720.54311	TRAINING/TRAVEL/	6,600.00	57.67	1,519.32	5,080.68	0.00	5,080.68	77%
101.1760.54463	WITNESS & JURY F	1,000.00	0.00	0.00	1,000.00	0.00	1,000.00	100%
101.1780.51111	PROBATION OFFICE	163,720.00	18,187.20	163,715.20	4.80	0.00	4.80	0%
101.1780.53111	DUES/SUPPLIES/IN	10,379.08	1,788.44	6,745.68	3,633.40	503.00	3,130.40	35%
101.1780.53113	TELEPHONE	1,617.50	103.32	981.93	635.57	17.50	618.07	39.3%
101.1780.53114	PROB-AWARE-DRUG	23,882.81	50.00	1,534.97	22,347.84	0.00	22,347.84	93.6%
101.1780.54311	TRAINING/TRAVEL/	5,000.00	1,180.00	1,455.00	3,545.00	0.00	3,545.00	70.9%
101.1785.51111	PROBATION OFFICE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.51112	PROB-SPEC DOCKET	53,078.40	3,460.80	31,172.00	21,906.40	8,056.80	13,849.60	41.3%
101.1785.52121	P E R S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.52123	WORKERS COMPENSA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.52125	EMPLOYEE INSURAN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.52126	MEDICARE & SOCIA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.53111	DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.53113	TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.53214	MAINTENANCE OF V	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.54113	INCENTIVE-P.I.I.	26,767.38	1,169.00	10,949.85	15,817.53	2,156.96	13,660.57	59.1%
101.1785.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.54111	SERVICES RECEIVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.54112	DRUG TESTING	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1785.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.51111	PROBATION OFFICE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.52121	P E R S-PIIG II	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.52123	WORKERS COMP-PII	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.52125	EMPLOYEE INSURAN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.52126	MEDICARE & SS-PI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.53111	DUES/SUPPLIES-PI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.53214	VEHICLE MAINTENA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.54311	TRAINING/TRAVEL-	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.54111	SERVICES REC'D-P	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1786.54112	DRUG TESTING-PII	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.51111	PROBATION OFFICE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.52121	P E R S-JRIG	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.52123	WORKERS COMPENSA	0.00	0.00	0.00	0.00	0.00	0.00	0%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.1787.52125	EMPLOYEE INSURAN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.52126	MEDICARE & SOCIA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.53111	DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.53113	TELEPHONE-JRIG	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.53214	VEHICLE MAINTENA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.54111	SERVICES RECEIVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1787.54112	DRUG TESTING-JRI	1,389.81	0.00	0.00	1,389.81	1,389.81	0.00	100%
101.1787.55511	EQUIPMENT-JRIG	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1788.51111	PROBATION OFFICE	100,000.00	12,182.41	92,452.52	7,547.48	0.00	7,547.48	7.5%
101.1788.52121	P E R S	15,100.00	1,073.18	13,922.54	1,177.46	1,073.18	104.28	7.8%
101.1788.52123	WORKERS COMPENSA	11,600.00	0.00	9,112.80	2,487.20	0.00	2,487.20	21.4%
101.1788.52125	EMPLOYEE INSURAN	30,000.00	2,335.02	22,932.64	7,067.36	0.00	7,067.36	23.6%
101.1788.52126	MEDICARE	1,500.00	162.63	1,435.36	64.64	0.00	64.64	4.3%
101.1788.53111	SUPPLIES	250.00	0.00	0.00	250.00	0.00	250.00	100%
101.1788.53113	COMMUNICATION	1,500.00	40.11	245.37	1,254.63	0.00	1,254.63	83.6%
101.1788.53114	ADVERTISING/PRIN	600.00	0.00	0.00	600.00	0.00	600.00	100%
101.1788.53115	TRANSPORTATION	2,100.00	0.00	0.00	2,100.00	0.00	2,100.00	100%
101.1788.54311	STAFF TRAINING/D	4,160.00	887.55	1,957.55	2,202.45	700.00	1,502.45	52.9%
101.1788.53214	MAINTENANCE & RE	500.00	0.00	0.00	500.00	0.00	500.00	100%
101.1788.54112	DRUG TESTING	20,624.00	0.00	624.00	20,000.00	20,000.00	0.00	97%
101.1788.54113	ALCOHOL TESTING	8,526.00	270.00	3,765.50	4,760.50	0.00	4,760.50	55.8%
101.1788.54114	CONFIRMATION TES	200.00	0.00	0.00	200.00	0.00	200.00	100%
101.1788.54115	TESTING SUPPLIES	1,000.00	0.00	0.00	1,000.00	0.00	1,000.00	100%
101.1788.54116	ELECTRONIC MONIT	4,000.00	0.00	0.00	4,000.00	0.00	4,000.00	100%
101.1788.54117	GED CLASSES/TEST	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1788.54118	COUNSELING	79,333.32	3,241.66	61,151.59	18,181.73	8,333.32	9,848.41	22.9%
101.1788.54119	EDUCATIONAL SUPP	1,500.00	0.00	657.91	842.09	0.00	842.09	56.1%
101.1788.54120	TRANSPORTATION P	1,500.00	0.00	0.00	1,500.00	0.00	1,500.00	100%
101.1788.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1800.51111	MERIT SYSTEM ADM	11,616.49	1,291.92	11,616.49	0.00	0.00	0.00	0%
101.1800.53111	DUES/SUPPLIES/IN	1,432.76	108.05	1,334.95	97.81	59.54	38.27	6.8%
101.1800.53113	TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1800.53115	TESTING	29,565.00	0.00	18,062.00	11,503.00	2,300.00	9,203.00	38.9%
101.1800.54111	CIVIL SERVICE LE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1800.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.51111	CHIEF, CAPTAIN &	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.51112	RADIO CLERK & EX	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.52121	P E R S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.52127	UNIFORMS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53111	DUES/SUPPLIES/IN	2,500.00	0.00	0.00	2,500.00	0.00	2,500.00	100%
101.1900.53112	AUXILIARY INCIDE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53113	TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53211	CHEMICAL ANALYSI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53213	SUSTENANCE OF PR	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53215	MAINTENANCE OF E	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53216	K-9 UNIT EXPENSE	685.71	0.00	0.00	685.71	0.00	685.71	100%
101.1900.53217	BIKE MAINT & REP	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.53218	UNIFORM MAINTENA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54112	MEDICAL TESTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54115	AUXILIARY	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54312	PRISONER TRANSFE	0.00	0.00	0.00	0.00	0.00	0.00	0%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.1900.54313	TRAINING/TRAVEL/	3,114.22	0.00	3,114.22	0.00	0.00	0.00	0%
101.1900.54423	INSURANCE DEDUCT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54451	L E A D S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54452	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54453	PURCHASE CRUISER	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54454	TAPE RECORDING L	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54455	PAGER LEASE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54488	TRANSFER TO C.O.	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54489	TRANSFER - CAP I	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54490	TRANSFER TO POLI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.54491	DOCTORS JAIL FUN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1900.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1950.53111	IMPOUND LOT SUPP	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.1950.54111	IMPOUND LOT TOWI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.51111	CHIEF CAPTAINS &	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.51112	FIRE EXECUTIVE S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.52121	P E R S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.52127	UNIFORMS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.53111	DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.53113	TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.53214	MAINTENANCE OF E	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.53218	UNIFORM MAINTENA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.54111	MEDICAL DIRECTOR	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.54211	UTILITIES	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.54312	TRAINING-CNG	11,827.12	0.00	11,175.00	652.12	0.00	652.12	5.5%
101.2100.54423	INSURANCE DEDUCT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.54490	TRANSFER TO FIRE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2100.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.51111	E M S SALARIES	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.52127	UNIFORMS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.53111	DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.53214	MAINTENANCE OF E	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.53215	HAZARDOUS MATERI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.53218	UNIFORM MAINTENA	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.54111	HEPATITIS SHOTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.54112	HEALTH & MEDICAL	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.54311	TRAINING/TRAVEL/	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.54423	INSURANCE DEDUCT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2150.55511	EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2200.54111	HUMANE OFFICER	37,473.28	0.00	22,034.32	15,438.96	11,950.00	3,488.96	41.2%
101.2200.54311	TRAINING/TRAVEL/	7,782.67	0.00	5,182.67	2,600.00	2,600.00	0.00	33.4%
101.2300.51111	SERVICE DIRECTOR	86,899.33	9,638.58	86,899.33	0.00	0.00	0.00	0%
101.2300.51112	S D ADMINISTRATI	46,519.20	5,431.68	46,501.68	17.52	0.00	17.52	0%
101.2300.53111	DUES/SUPPLIES/IN	5,078.25	141.12	4,017.27	1,060.98	74.54	986.44	20.9%
101.2300.53113	TELEPHONE	3,212.50	269.28	3,120.03	92.47	40.50	51.97	2.9%
101.2300.53214	MAINTENANCE OF V	1,080.00	24.23	41.22	1,038.78	0.00	1,038.78	96.2%
101.2300.54111	SERVICES RECEIVE	90,336.47	13,848.90	54,940.15	35,396.32	28,000.00	7,396.32	39.2%
101.2300.54115	WORKERS COMP. CO	6,850.00	0.00	6,025.00	825.00	0.00	825.00	12%
101.2300.54311	TRAINING/TRAVEL/	500.00	199.00	433.00	67.00	0.00	67.00	13.4%
101.2300.54451	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2350.51111	PROPERTY MAINT O	47,633.00	5,294.10	47,599.02	33.98	0.00	33.98	0.1%
101.2350.53111	DUES/SUPPLIES/IN	556.00	<821.44>	94.32	461.68	15.00	446.68	83%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.2350.53113	TELEPHONE	800.00	40.80	514.25	285.75	50.00	235.75	35.7%
101.2350.53214	MAINTENANCE OF E	1,720.00	84.14	1,078.50	641.50	112.00	529.50	37.3%
101.2350.54111	SERVICES RECEIVE	12,930.00	0.00	11,350.00	1,580.00	180.00	1,400.00	12.2%
101.2350.54311	TRAINING/TRAVEL/	70.00	0.00	57.00	13.00	0.00	13.00	18.6%
101.2350.54451	COMPUTER MAINTEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2400.51111	DIRECTOR OF ENGI	90,898.00	10,163.16	90,861.46	36.54	0.00	36.54	0%
101.2400.51112	ASSISTANTS & CLE	244,675.00	30,784.41	244,550.81	124.19	0.00	124.19	0.1%
101.2400.51113	CODE ENFORCEMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2400.51114	ASSISTANT TO ENG	59,118.00	7,656.98	59,101.03	16.97	0.00	16.97	0%
101.2400.52127	UNIFORM RENTAL	2,000.00	53.98	376.43	1,623.57	75.00	1,548.57	81.2%
101.2400.53111	DUES/SUPPLIES/IN	16,286.25	419.69	14,886.97	1,399.28	204.54	1,194.74	8.6%
101.2400.53113	TELEPHONE	2,635.00	208.67	2,242.81	392.19	135.00	257.19	14.9%
101.2400.53214	MAINTENANCE OF E	8,800.00	323.72	4,675.76	4,124.24	360.00	3,764.24	46.9%
101.2400.54111	SERVICES RECEIVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2400.54115	CONTRACT ENGINEE	1,149,006.77	102,580.48	571,815.25	577,191.52	205,309.73	371,881.79	50.2%
101.2400.54311	TRAINING/TRAVEL/	2,945.60	879.00	1,499.00	1,446.60	0.00	1,446.60	49.1%
101.2400.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
101.2400.55511	OFFICE EQUIPMENT	14,085.00	5,172.49	8,788.48	5,296.52	100.00	5,196.52	37.6%
101.2400.55512	FIELD EQUIPMENT	9,000.00	788.66	962.92	8,037.08	550.00	7,487.08	89.3%
101.2500.51111	SUPERINTENDENT	26,700.00	3,636.48	25,062.50	1,637.50	0.00	1,637.50	6.1%
101.2500.51112	P B & L EMPLOYEE	45,000.00	6,144.64	44,920.50	79.50	0.00	79.50	0.2%
101.2500.51113	SEASONAL EMPLOYE	8,500.00	0.00	3,983.64	4,516.36	0.00	4,516.36	53.1%
101.2500.52127	UNIFORMS	2,900.00	9.00	1,498.36	1,401.64	65.00	1,336.64	48.3%
101.2500.53111	DUES/SUPPLIES/IN	974.13	200.96	755.38	218.75	54.53	164.22	22.5%
101.2500.53113	TELEPHONE	1,500.00	216.72	706.46	793.54	40.11	753.43	52.9%
101.2500.53215	JANITORIAL SUPPL	12,000.00	<38.11>	7,560.60	4,439.40	0.00	4,439.40	37%
101.2500.53312	MAINTENANCE & RE	413,070.11	1,868.04	227,474.23	185,595.88	34,164.49	151,431.39	44.9%
101.2500.54111	JANITORIAL CONTR	67,000.00	5,510.35	57,784.79	9,215.21	5,751.24	3,463.97	13.8%
101.2500.54116	REFUSE REMOVAL	1,895.00	133.00	1,596.00	299.00	0.00	299.00	15.8%
101.2500.54211	UTILITIES	186,449.00	8,950.87	100,150.39	86,298.61	24,236.00	62,062.61	46.3%
101.2500.54311	TRAINING/TRAVEL/	500.00	18.75	102.25	397.75	0.00	397.75	79.6%
101.2500.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
101.2500.56613	ARBOR TRUST	45,345.00	16,993.35	32,973.75	12,371.25	10,900.15	1,471.10	27.3%
101.2500.55511	TOOLS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2600.51111	SUPERINTENDENT	35,200.00	6,823.10	28,249.12	6,950.88	0.00	6,950.88	19.7%
101.2600.51112	PARKS EMPLOYEES	198,000.00	22,554.12	186,431.49	11,568.51	0.00	11,568.51	5.8%
101.2600.51113	SEASONAL EMPLOYE	58,000.00	304.42	56,219.39	1,780.61	0.00	1,780.61	3.1%
101.2600.52127	UNIFORMS	6,850.00	0.00	2,984.62	3,865.38	100.00	3,765.38	56.4%
101.2600.53111	DUES/SUPPLIES/IN	2,682.12	200.77	2,066.78	615.34	44.53	570.81	22.9%
101.2600.53113	TELEPHONE	5,310.00	476.76	5,142.12	167.88	10.00	157.88	3.2%
101.2600.53215	JANITORIAL SUPPL	5,000.00	0.00	2,520.66	2,479.34	0.00	2,479.34	49.6%
101.2600.53312	MAINTENANCE & RE	193,577.25	5,921.88	74,238.26	119,338.99	15,995.67	103,343.32	61.6%
101.2600.53313	MAINT-REPAIR-ANC	2,000.00	0.00	0.00	2,000.00	0.00	2,000.00	100%
101.2600.54211	UTILITIES-BALL F	16,843.00	1,127.82	11,415.22	5,427.78	2,370.00	3,057.78	32.2%
101.2600.54311	TRAINING/TRAVEL/	200.00	18.75	191.00	9.00	0.00	9.00	4.5%
101.2600.54423	INSURANCE DEDUCT	500.00	0.00	500.00	0.00	0.00	0.00	0%
101.2600.54490	TRANSFER TO PARK	3,750.00	470.00	3,250.00	500.00	0.00	500.00	13.3%
101.2600.55511	PLAYGROUND EQUIP	10,000.00	0.00	4,800.00	5,200.00	0.00	5,200.00	52%
101.2600.55512	TOOLS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2600.56613	PICKLEBALL COURT	5,000.00	0.00	0.00	5,000.00	0.00	5,000.00	100%
101.2600.56614	PLAYGROUND EQUIP	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2620.51111	RECREATION PERSO	15,067.89	0.00	1,986.00	13,081.89	0.00	13,081.89	86.8%
101.2620.53111	DUES/SUPPLIES/IN	3,750.00	0.00	3,532.17	217.83	0.00	217.83	5.8%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.2620.53113	TELEPHONE	980.00	73.24	848.75	131.25	80.00	51.25	13.4%
101.2620.54111	REC DIRECTOR CON	9,134.11	1,014.72	9,134.11	0.00	0.00	0.00	0%
101.2620.54483	HIKE AND BIKE PR	246.75	0.00	0.00	246.75	0.00	246.75	100%
101.2640.51111	POOL PERSONNEL	151,868.64	0.00	342.35	151,526.29	0.00	151,526.29	99.8%
101.2640.52121	POOL - P.E.R.S.	25,680.00	0.00	10.08	25,669.92	0.00	25,669.92	100%
101.2640.53111	DUES/SUPPLIES/IN	14,479.00	0.00	1,809.18	12,669.82	0.00	12,669.82	87.5%
101.2640.53112	CONCESSION EXPEN	28,000.00	0.00	0.00	28,000.00	0.00	28,000.00	100%
101.2640.53113	TELEPHONE	3,500.00	226.09	3,140.46	359.54	0.00	359.54	10.3%
101.2640.53114	PROMOTION & ADVE	8,141.55	0.00	8,141.55	0.00	0.00	0.00	0%
101.2640.53115	STATE SALES TAX	2,834.00	0.00	0.00	2,834.00	0.00	2,834.00	100%
101.2640.53211	CHEMICALS	45,000.00	0.00	1,309.03	43,690.97	0.00	43,690.97	97.1%
101.2640.53312	POOL EQUIPMENT M	96,150.00	3,108.52	77,524.54	18,625.46	11,099.00	7,526.46	19.4%
101.2640.54211	UTILITIES	33,600.00	440.67	8,113.84	25,486.16	1,250.00	24,236.16	75.9%
101.2640.54311	TRAINING/TRAVEL/	2,500.00	0.00	600.00	1,900.00	0.00	1,900.00	76%
101.2640.54484	TRANSFER TO BOND	226,000.00	0.00	225,651.66	348.34	0.00	348.34	0.2%
101.2640.55511	POOL NEW EQUIPME	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2650.51111	PERSONNEL & BENE	18,690.00	0.00	1,830.00	16,860.00	0.00	16,860.00	90.2%
101.2650.52121	P E R S	2,616.60	22.40	1,983.10	633.50	0.00	633.50	24.2%
101.2650.52123	WORKERS COMPENSA	394.47	0.00	0.00	394.47	0.00	394.47	100%
101.2650.52126	MEDICARE & SOCIA	298.93	0.00	205.40	93.53	0.00	93.53	31.3%
101.2650.53111	DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.2650.56613	ARBOR PLANTINGS	267,384.00	10,271.00	179,895.01	87,488.99	5,670.00	81,818.99	32.7%
101.3600.51111	EMPLOYEE FINAL P	69,622.45	0.00	67,646.30	1,976.15	0.00	1,976.15	2.8%
101.3600.52121	P E R S (SERVICE	154,600.00	9,307.32	122,220.87	32,379.13	10,500.00	21,879.13	20.9%
101.3600.52123	WORKERS COMPENSA	78,000.00	0.00	33,363.60	44,636.40	0.00	44,636.40	57.2%
101.3600.52124	UNEMPLOYMENT COM	15,800.00	0.00	2,514.38	13,285.62	1,670.00	11,615.62	84.1%
101.3600.52125	EMPLOYEE INSURAN	1,594,000.00	41,382.82	758,957.14	835,042.86	0.00	835,042.86	52.4%
101.3600.52126	MEDICARE & SOCIA	37,500.00	3,641.80	33,192.00	4,308.00	0.00	4,308.00	11.5%
101.3600.52128	ACC LIAB PRIN-P&	14,800.00	0.00	14,707.40	92.60	0.00	92.60	0.6%
101.3600.52129	ACC LIAB INT-P&F	13,200.00	0.00	13,167.32	32.68	0.00	32.68	0.2%
101.3600.53311	RADIO REPAIR	15,579.94	0.00	14,965.20	614.74	0.00	614.74	3.9%
101.3600.53312	SIRENS	7,500.00	0.00	0.00	7,500.00	0.00	7,500.00	100%
101.3600.53313	WASTE REMOVAL (C	21,377.55	0.00	21,377.55	0.00	0.00	0.00	0%
101.3600.53314	UPS SERVICE	3,300.00	11.24	960.06	2,339.94	60.00	2,279.94	70.9%
101.3600.54111	PUBLIC DEFENDER	45,000.00	0.00	0.00	45,000.00	0.00	45,000.00	100%
101.3600.54112	KNOX COUNTY AUDI	23,250.00	0.31	23,038.62	211.38	0.00	211.38	0.9%
101.3600.54113	STATE INCOME TAX	500.00	0.00	197.09	302.91	0.00	302.91	60.6%
101.3600.54117	STATE EXAMINERS	36,250.00	0.00	26,540.20	9,709.80	0.00	9,709.80	26.8%
101.3600.54118	ELECTION EXPENSE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54119	URBAN IMPROVEMEN	9,250.00	0.00	7,108.20	2,141.80	0.00	2,141.80	23.2%
101.3600.54211	STREET LIGHTING	236,555.00	17,769.69	207,542.17	29,012.83	20,450.00	8,562.83	12.3%
101.3600.54411	LEGAL ADVERTISIN	6,624.93	299.70	4,390.21	2,234.72	1,300.00	934.72	33.7%
101.3600.54412	REFUSE HAULER'S	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54421	INSURANCE - LIAB	16,750.00	0.00	16,082.00	668.00	0.00	668.00	4%
101.3600.54424	INSURANCE - PROP	114,710.00	0.00	114,009.00	701.00	0.00	701.00	0.6%
101.3600.54425	INSURANCE - BOIL	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54426	INSURANCE - AUTO	21,997.00	0.00	21,997.00	0.00	0.00	0.00	0%
101.3600.54428	INSURANCE - LAW	4,693.00	0.00	4,432.00	261.00	0.00	261.00	5.6%
101.3600.54430	INSURANCE - EMPL	1,200.00	1,167.50	1,167.50	32.50	0.00	32.50	2.7%
101.3600.54431	INSURANCE - PUB.	8,500.00	0.00	8,248.50	251.50	0.00	251.50	3%
101.3600.54451	GENERAL EXPENSES	43,984.75	2,511.68	37,001.70	6,983.05	270.00	6,713.05	15.9%
101.3600.54452	RENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54453	EMS BILLING CHAR	58,400.00	7,874.48	46,871.53	11,528.47	4,500.00	7,028.47	19.7%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
101.3600.54455	LEASE/PURCHASE F	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54464	TAX LIENS	4,500.00	0.00	2,910.91	1,589.09	0.00	1,589.09	35.3%
101.3600.54466	RESERVE BALANCE	1,455,645.07	0.00	0.00	1,455,645.07	0.00	1,455,645.07	100%
101.3600.54472	LAW LIBRARY	25,000.00	0.00	6,319.60	18,680.40	6,985.43	11,694.97	74.7%
101.3600.54473	CODIFICATION	7,890.00	0.00	4,575.00	3,315.00	0.00	3,315.00	42%
101.3600.54474	RECORDING (COURT	1,500.00	0.00	34.00	1,466.00	0.00	1,466.00	97.7%
101.3600.54475	PLANNING COMMISS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54476	AIRPORT AUTHORIT	6,000.00	1,500.00	6,000.00	0.00	0.00	0.00	0%
101.3600.54477	TREE CARE & TRIM	13,500.00	0.00	3,850.00	9,650.00	0.00	9,650.00	71.5%
101.3600.54478	EMERGENCY MANAGE	6,000.00	0.00	6,000.00	0.00	0.00	0.00	0%
101.3600.54479	CONTRACT GENERAL	56,650.00	0.00	56,650.00	0.00	0.00	0.00	0%
101.3600.54480	HEALTH & SAFETY	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54481	ZONING	2,098.25	244.54	1,334.77	763.48	44.54	718.94	36.4%
101.3600.54482	RIVERS & HARBORS	4,000.00	0.00	3,231.00	769.00	0.00	769.00	19.2%
101.3600.54483	W&J RUDIN-DOWNTO	16,590.11	0.00	1,380.00	15,210.11	0.00	15,210.11	91.7%
101.3600.54484	BICENTENNIAL COO	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54485	BICENTENNIAL EVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54486	LEGACY VIDEOS	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54490	TRANSFER TO CAPI	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54491	TRANSFER TO CEME	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.54492	TRANSFER TO PARK	15,000.00	0.00	7,500.00	7,500.00	0.00	7,500.00	50%
101.3600.54493	JULY 4TH CELEBRA	10,000.00	0.00	0.00	10,000.00	0.00	10,000.00	100%
101.3600.54494	NETWORKING SYSTE	86,500.00	5,469.70	82,827.58	3,672.42	3,000.00	672.42	4.2%
101.3600.55514	RIVERSIDE PARK L	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.55515	KNOX LAB PROJECT	0.00	0.00	0.00	0.00	0.00	0.00	0%
101.3600.55516	KOKOSING GAP TRA	2,000.00	0.00	2,000.00	0.00	0.00	0.00	0%
101.3600.55517	COVID-19-PUBLIC	1,064.01	1,064.01	1,064.01	0.00	0.00	0.00	0%
101.3600.55518	AREA DEVELOPMENT	25,000.00	0.00	25,000.00	0.00	0.00	0.00	0%
101.3600.55519	KNOX AREA TRANSI	22,500.00	5,625.00	22,500.00	0.00	0.00	0.00	0%
TOTAL GENERAL FUND		11,394,506.55	630,264.20	6,886,797.34	4,507,709.21	487,493.18	4,020,216.03	39.6%
201.2900.51111	SUPERINTENDENT &	121,000.00	10,551.41	117,355.46	3,644.54	0.00	3,644.54	3%
201.2900.51112	EMPLOYEES	373,100.00	48,244.80	369,578.34	3,521.66	0.00	3,521.66	0.9%
201.2900.51113	SEASONAL EMPLOYE	38,000.00	5,443.64	28,312.89	9,687.11	0.00	9,687.11	25.5%
201.2900.52121	P E R S	76,500.00	6,045.31	68,484.61	8,015.39	5,150.00	2,865.39	10.5%
201.2900.52123	WORKERS COMPENSA	11,000.00	0.00	8,170.70	2,829.30	0.00	2,829.30	25.7%
201.2900.52124	UNEMPLOYMENT COM	7,250.00	0.00	6,958.90	291.10	200.00	91.10	4%
201.2900.52125	EMPLOYEE INSURAN	228,100.00	12,671.42	209,825.02	18,274.98	0.00	18,274.98	8%
201.2900.52126	MEDICARE & SOCIA	7,417.00	893.19	7,105.38	311.62	0.00	311.62	4.2%
201.2900.52127	UNIFORM RENTAL	10,157.41	429.25	5,924.26	4,233.15	500.00	3,733.15	41.7%
201.2900.53113	TELEPHONE	6,106.91	379.13	4,875.02	1,231.89	70.00	1,161.89	20.2%
201.2900.53214	VEHICLE GASOLINE	5,000.00	58.01	4,195.00	805.00	0.00	805.00	16.1%
201.2900.53312	VEHICLE/EQUIP -	20,900.00	661.41	14,324.63	6,575.37	4,021.33	2,554.04	31.5%
201.2900.53313	MATERIALS & SUPP	153,973.75	8,334.25	74,618.83	79,354.92	11,612.79	67,742.13	51.5%
201.2900.53314	TRAFFIC LIGHT MA	10,000.00	0.00	36.50	9,963.50	5,000.00	4,963.50	99.6%
201.2900.53315	SCAPE LIGHT	0.00	0.00	0.00	0.00	0.00	0.00	0%
201.2900.53316	STREET SIGNS	19,522.00	0.00	4,434.09	15,087.91	2,122.25	12,965.66	77.3%
201.2900.54211	TRAFFIC LIGHT UT	45,005.00	2,412.46	28,683.03	16,321.97	5,925.00	10,396.97	36.3%
201.2900.54113	STATE INCOME TAX	50.00	0.00	11.38	38.62	0.00	38.62	77.2%
201.2900.54311	TRAINING/TRAVEL/	1,500.00	<51.25>	529.73	970.27	0.00	970.27	64.7%
201.2900.54421	INSURANCE - LIAB	2,583.00	0.00	2,583.00	0.00	0.00	0.00	0%
201.2900.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
201.2900.54426	INSURANCE - AUTO	2,978.00	0.00	2,974.00	4.00	0.00	4.00	0.1%
201.2900.55511	TOOLS	14,460.00	0.00	2,398.95	12,061.05	0.00	12,061.05	83.4%
201.3600.51111	EMPLOYEE FINAL P	35,900.00	0.00	0.00	35,900.00	0.00	35,900.00	100%
TOTAL STREET FUND		1,191,003.07	96,073.03	961,379.72	229,623.35	34,601.37	195,021.98	19.3%
202.2900.55514	HIGHWAY PAVING/I	119,146.43	22,529.68	84,834.68	34,311.75	3,509.81	30,801.94	28.8%
203.2900.55514	PERMISSIVE AUTO	75,000.00	0.00	0.00	75,000.00	0.00	75,000.00	100%
204.3100.51111	SUPERINTENDENT	6,320.00	2,642.75	6,288.82	31.18	0.00	31.18	0.5%
204.3100.51112	CLERK & EMPLOYEE	196,000.00	20,018.35	190,153.63	5,846.37	0.00	5,846.37	3%
204.3100.51113	SEASONAL EMPLOYE	23,000.00	189.04	22,952.16	47.84	0.00	47.84	0.2%
204.3100.52121	P E R S	34,200.00	1,993.21	29,581.73	4,618.27	2,000.00	2,618.27	13.5%
204.3100.52123	WORKERS COMPENSA	3,790.00	0.00	3,787.90	2.10	0.00	2.10	0.1%
204.3100.52124	UNEMPLOYMENT COM	4,700.00	0.00	3,106.84	1,593.16	1,500.00	93.16	33.9%
204.3100.52125	EMPLOYEE INSURAN	76,410.00	4,522.34	71,781.41	4,628.59	0.00	4,628.59	6.1%
204.3100.52126	MEDICARE & SOCIA	3,600.00	371.06	3,094.92	505.08	0.00	505.08	14%
204.3100.52127	UNIFORM RENTAL	4,250.00	191.75	3,150.00	1,100.00	90.00	1,010.00	25.9%
204.3100.53111	DUES/SUPPLIES/IN	3,506.25	625.57	3,081.36	424.89	54.54	370.35	12.1%
204.3100.53113	TELEPHONE	2,010.00	159.66	1,894.43	115.57	10.00	105.57	5.7%
204.3100.53214	VEHICLE-MAINTENA	9,050.00	227.88	7,185.65	1,864.35	0.00	1,864.35	20.6%
204.3100.53312	MAINTENANCE & RE	9,100.00	109.45	5,953.34	3,146.66	409.45	2,737.21	34.6%
204.3100.53313	MATERIALS & SUPP	10,750.00	369.11	5,988.67	4,761.33	250.00	4,511.33	44.3%
204.3100.54111	TREE TRIMMING &	6,000.00	0.00	3,315.00	2,685.00	0.00	2,685.00	44.8%
204.3100.54113	STATE INCOME TAX	50.00	0.00	15.18	34.82	0.00	34.82	69.6%
204.3100.54112	MONUMENT & FOUND	13,000.00	0.00	8,500.00	4,500.00	0.00	4,500.00	34.6%
204.3100.54211	UTILITIES	5,725.00	371.48	4,052.50	1,672.50	593.00	1,079.50	29.2%
204.3100.54311	TRAINING/TRAVEL/	200.00	18.75	124.50	75.50	0.00	75.50	37.8%
204.3100.54421	INSURANCE - LIAB	625.00	0.00	559.00	66.00	0.00	66.00	10.6%
204.3100.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
204.3100.54426	INSURANCE - VEHI	325.00	0.00	278.00	47.00	0.00	47.00	14.5%
204.3100.54462	BURIAL RELIEF	19,000.00	900.00	17,092.75	1,907.25	0.00	1,907.25	10%
204.3100.54464	TAX LIEN	300.00	0.00	282.00	18.00	0.00	18.00	6%
204.3100.54465	CEMETERY OVERPAY	0.00	0.00	0.00	0.00	0.00	0.00	0%
204.3100.55511	EQUIPMENT	8,000.00	0.00	0.00	8,000.00	400.00	7,600.00	100%
204.3100.55515	CEMETERY EXPANSI	11,580.00	0.00	0.00	11,580.00	0.00	11,580.00	100%
204.3600.51111	EMPLOYEE FINAL P	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL CEMETERY FUND		451,991.25	32,710.40	392,219.79	59,771.46	5,306.99	54,464.47	13.2%
205.2600.55515	PARK DEVELOPMENT	19,782.92	0.00	0.00	19,782.92	0.00	19,782.92	100%
205.2600.56523	AMERIFLORA TRUST	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL PARK DEVELOPMENT FUND		19,782.92	0.00	0.00	19,782.92	0.00	19,782.92	100%
206.2300.54115	SMALL CITIES GRA	102,338.38	0.00	62,588.38	39,750.00	0.00	39,750.00	38.8%
206.2300.54116	DOWNTOWN GRANT-A	0.00	0.00	0.00	0.00	0.00	0.00	0%
206.2300.54117	NSP GRANT-ADMINI	0.00	0.00	0.00	0.00	0.00	0.00	0%
206.2300.54475	SMALL CITIES - P	0.00	0.00	0.00	0.00	0.00	0.00	0%
206.2300.55515	SMALL CITIES GRA	1,074,329.36	420.00	828,827.36	245,502.00	66,302.00	179,200.00	22.9%
206.2300.55516	DOWNTOWN GRANT-C	0.00	0.00	0.00	0.00	0.00	0.00	0%
206.2300.55517	C.D.B.G.-PROGRAM	52,966.76	9,000.00	9,152.00	43,814.76	80.00	43,734.76	82.7%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
206.2300.55518 NSP GRANT-LAND B	0.00	0.00	0.00	0.00	0.00	0.00	0%
206.2300.55519 NSP GRANT-HOUSIN	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL C.D.B.G. REHAB PROGRAM	1,229,634.50	9,420.00	900,567.74	329,066.76	66,382.00	262,684.76	26.8%
207.1900.51111 METER ATTENDANTS	13,000.00	0.00	4,150.00	8,850.00	0.00	8,850.00	68.1%
207.1900.52121 P E R S	1,970.00	0.00	633.49	1,336.51	0.00	1,336.51	67.8%
207.1900.52123 WORKERS COMPENSA	950.00	0.00	740.20	209.80	0.00	209.80	22.1%
207.1900.52125 METER EMPLOYEE I	0.00	0.00	0.00	0.00	0.00	0.00	0%
207.1900.52126 MEDICARE & SOCIA	190.00	0.00	60.18	129.82	0.00	129.82	68.3%
207.1900.52127 METER UNIFORMS	1,050.00	0.00	413.44	636.56	0.00	636.56	60.6%
207.1900.53111 METER STATIONERY	0.00	0.00	0.00	0.00	0.00	0.00	0%
207.1900.53214 METER MAINTENANC	0.00	0.00	0.00	0.00	0.00	0.00	0%
207.1900.53218 METER UNIFORM MA	80.00	0.00	0.00	80.00	0.00	80.00	100%
207.1900.54211 UTILITIES	6,287.86	431.71	5,203.48	1,084.38	754.32	330.06	17.2%
207.1900.54464 TAX LIEN	20.00	0.00	15.00	5.00	0.00	5.00	25%
207.1900.54465 PERMITS REFUND	0.00	0.00	0.00	0.00	0.00	0.00	0%
207.1900.54468 TRANSFER TO GENE	0.00	0.00	0.00	0.00	0.00	0.00	0%
207.3600.51111 EMPLOYEE FINAL P	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL PARKING FUND	23,547.86	431.71	11,215.79	12,332.07	754.32	11,577.75	52.4%
208.1900.51111 CHIEF, CAPTAIN,	2,068,670.55	<436,333.59>	1,550,275.19	518,395.36	0.00	518,395.36	25.1%
208.2100.51111 CHIEF, CAPTAIN,	2,889,626.45	<564,301.00>	2,196,239.06	693,387.39	0.00	693,387.39	24%
208.3600.54113 STATE INCOME TAX	190.01	0.00	189.59	0.42	0.00	0.42	0.2%
TOTAL MUNI INCOME TAX 1/2% VO	4,958,487.01	<1,000,634.59>	3,746,703.84	1,211,783.17	0.00	1,211,783.17	24.4%
209.1900.53216 LAW ENFORCEMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
210.1900.53216 DRUG ENFORCEMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
211.2900.53312 P.L.R.-ST. VEHIC	16,450.00	862.00	10,912.30	5,537.70	2,650.00	2,887.70	33.7%
211.2900.53313 P.L.R.-ST. MATER	131,684.69	6,914.14	72,805.07	58,879.62	6,800.99	52,078.63	44.7%
211.2900.53314 P.L.R.-ST. TRAFF	1,044.88	0.00	299.88	745.00	0.00	745.00	71.3%
TOTAL PERMISSIVE LICENSE REGI	149,179.57	7,776.14	84,017.25	65,162.32	9,450.99	55,711.33	43.7%
212.1700.53216 INDIGENT DRS ALC	55,140.84	0.00	1,762.50	53,378.34	0.00	53,378.34	96.8%
213.1700.53216 DUI ENFORCEMENT	43,487.20	0.00	0.00	43,487.20	0.00	43,487.20	100%
214.1700.51111 COMPUTER PERSONN	0.00	0.00	0.00	0.00	0.00	0.00	0%
214.1700.54451 COURT COMPUTER M	19,816.20	1,734.29	15,346.74	4,469.46	0.00	4,469.46	22.6%
214.1700.54490 TRANSFER TO COUR	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL CLERK COMPUTER FUND	19,816.20	1,734.29	15,346.74	4,469.46	0.00	4,469.46	22.6%
215.1780.51111 PROBATION CLERK	42,000.00	0.00	19,302.08	22,697.92	0.00	22,697.92	54%
215.1780.52121 P E R S	6,400.00	386.89	5,021.38	1,378.62	386.89	991.73	21.5%
215.1780.52123 WORKERS COMPENSA	900.00	0.00	331.50	568.50	0.00	568.50	63.2%
215.1780.52125 EMPLOYEE INSURAN	12,500.00	563.69	9,869.54	2,630.46	0.00	2,630.46	21%
215.1780.52126 MEDICARE & SOCIA	650.00	58.43	535.79	114.21	0.00	114.21	17.6%
215.1780.53111 PROBATION SERVIC	107,020.58	0.00	0.00	107,020.58	0.00	107,020.58	100%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
TOTAL PROBATION SERVICE FUND	169,470.58	1,009.01	35,060.29	134,410.29	386.89	134,023.40	79.3%
216.1700.53111 SPECIAL PROJECTS	85,000.00	0.00	0.00	85,000.00	0.00	85,000.00	100%
TOTAL SPECIAL PROJECTS FUND	85,000.00	0.00	0.00	85,000.00	0.00	85,000.00	100%
217.1300.51111 PERSONNEL & BENE	0.00	0.00	0.00	0.00	0.00	0.00	0%
217.1300.53111 MATERIALS & SUPP	0.00	0.00	0.00	0.00	0.00	0.00	0%
217.1300.53215 MAINTENANCE OF E	149,771.69	0.00	149,771.69	0.00	0.00	0.00	0%
217.1300.54111 CONTRACT SERVICE	0.00	0.00	0.00	0.00	0.00	0.00	0%
217.1300.54112 ADMINISTRATIVE F	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL F.E.M.A. FUND	149,771.69	0.00	149,771.69	0.00	0.00	0.00	0%
218.1700.51111 COMPUTER PERSONN	4,200.00	0.00	952.85	3,247.15	0.00	3,247.15	77.3%
218.1700.54451 CLERK COMPUTER M	143,036.84	42,752.91	79,479.13	63,557.71	150.00	63,407.71	44.4%
TOTAL COURT COMPUTER FUND	147,236.84	42,752.91	80,431.98	66,804.86	150.00	66,654.86	45.4%
219.1300.54492 SERVICES RECEIVE	124,000.00	4,653.96	75,881.42	48,118.58	0.00	48,118.58	38.8%
TOTAL LODGING EXCISE TAX	124,000.00	4,653.96	75,881.42	48,118.58	0.00	48,118.58	38.8%
220.1700.53216 DRIVERS INTERLOC	155,792.76	0.00	712.50	155,080.26	0.00	155,080.26	99.5%
TOTAL DRIVERS INTERLOCK & ALC	155,792.76	0.00	712.50	155,080.26	0.00	155,080.26	99.5%
221.2900.55514 HIGHWAY PAVING/I	1,310.97	0.00	0.00	1,310.97	0.00	1,310.97	100%
TOTAL PUBLIC SERVICE STREET R	1,310.97	0.00	0.00	1,310.97	0.00	1,310.97	100%
222.1300.55514 HIAWATHA WATER P	4,437.86	0.00	0.00	4,437.86	0.00	4,437.86	100%
TOTAL HIAWATHA WATER PK SCHLR	4,437.86	0.00	0.00	4,437.86	0.00	4,437.86	100%
AVAILABLE PETITION FUND							
223.1300.54492 SERVICES RECEIVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
223.1300.55514 SERVICES RECEIVE	87,791.54	0.00	21,656.37	66,135.17	0.00	66,135.17	75.3%
TOTAL AVAILABLE PETITION FUND	87,791.54	0.00	21,656.37	66,135.17	0.00	66,135.17	75.3%
1/2% INCOME TAX #2 (VOTED)							
224.1900.51111 CHIEF, CAPTAIN &	497,000.00	310,251.23	310,251.23	186,748.77	0.00	186,748.77	37.6%
224.1900.51112 RADIO CLERK & EX	148,500.00	16,405.65	148,456.70	43.30	0.00	43.30	0%
224.1900.52121 P E R S	22,600.00	1,528.12	19,840.98	2,759.02	1,532.73	1,226.29	12.2%
224.1900.52123 WORKERS COMPENSA	50,000.00	0.00	35,677.23	14,322.77	0.00	14,322.77	28.6%
224.1900.52125 EMPLOYEE INSURAN	679,500.00	40,020.54	619,400.34	60,099.66	0.00	60,099.66	8.8%
224.1900.52126 MEDICARE & SOCIA	33,750.00	3,686.75	32,722.54	1,027.46	0.00	1,027.46	3%
224.1900.52127 UNIFORMS	31,516.75	1,323.09	25,100.01	6,416.74	3,933.06	2,483.68	20.4%
224.1900.53111 DUES/SUPPLIES/IN	26,998.25	1,299.96	16,470.23	10,528.02	3,413.54	7,114.48	39%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
224.1900.53112	AUXILIARY INCIDE	0.00	0.00	0.00	0.00	0.00	0.00	0%
224.1900.53113	TELEPHONE	26,690.51	706.17	20,618.90	6,071.61	2,269.40	3,802.21	22.7%
224.1900.53211	CHEMICAL ANALYSI	4,100.00	250.00	1,595.00	2,505.00	750.00	1,755.00	61.1%
224.1900.53213	SUSTENANCE OF PR	0.00	0.00	0.00	0.00	0.00	0.00	0%
224.1900.53215	MAINTENANCE OF E	133,314.24	7,420.65	71,824.23	61,490.01	14,832.08	46,657.93	46.1%
224.1900.53216	K-9 UNIT EXPENSE	5,542.68	184.99	1,775.33	3,767.35	324.99	3,442.36	68%
224.1900.53217	BIKE MAINTENANCE	1,250.00	0.00	0.00	1,250.00	0.00	1,250.00	100%
224.1900.53218	UNIFORM MAINTENA	10,950.00	226.66	9,124.51	1,825.49	600.00	1,225.49	16.7%
224.1900.54112	MEDICAL TESTS	6,800.00	0.00	2,209.30	4,590.70	200.00	4,390.70	67.5%
224.1900.54115	AUXILIARY	0.00	0.00	0.00	0.00	0.00	0.00	0%
224.1900.54311	TRAINING/TRAVEL/	56,780.00	4,409.28	39,770.48	17,009.52	11,309.31	5,700.21	30%
224.1900.54313	TRAINING/TRAVEL/	3,114.22	0.00	3,114.22	0.00	0.00	0.00	0%
224.1900.54423	INSURANCE DEDUCT	3,000.00	0.00	1,000.00	2,000.00	0.00	2,000.00	66.7%
224.1900.54451	L.E.A.D.S.	8,100.00	600.00	7,200.00	900.00	600.00	300.00	11.1%
224.1900.54452	COMPUTER MAINTEN	101,188.00	0.00	76,223.40	24,964.60	16,682.00	8,282.60	24.7%
224.1900.54453	PURCHASE CRUISER	99,000.00	1,741.97	96,944.37	2,055.63	700.00	1,355.63	2.1%
224.1900.54490	TRANSFER TO POLI	270,000.00	65,000.00	245,000.00	25,000.00	0.00	25,000.00	9.3%
224.1900.55511	EQUIPMENT	33,026.49	707.17	24,810.70	8,215.79	5,652.75	2,563.04	24.9%
224.1950.53111	IMPOUND LOT SUPP	1,000.00	0.00	260.96	739.04	0.00	739.04	73.9%
224.1950.54111	IMPOUND LOT TOWI	18,010.00	360.00	5,940.00	12,070.00	1,890.00	10,180.00	67%
TOTAL POLICE DEPARTMENT		2,271,731.14	456,122.23	1,815,330.66	456,400.48	64,689.86	391,710.62	20.1%
224.2100.51111	CHIEF CAPTAINS &	625,000.00	454,116.74	454,116.74	170,883.26	0.00	170,883.26	27.3%
224.2100.51112	FIRE EXECUTIVE S	49,150.00	5,328.00	49,149.92	0.08	0.00	0.08	0%
224.2100.52121	P E R S	7,500.00	497.28	6,446.27	1,053.73	497.28	556.45	14%
224.2100.52123	WORKERS COMPENSA	67,000.00	0.00	48,856.40	18,143.60	0.00	18,143.60	27.1%
224.2100.52125	EMPLOYEE INSURAN	1,116,850.00	63,080.09	996,828.85	120,021.15	0.00	120,021.15	10.7%
224.2100.52126	MEDICARE & SOCIA	49,500.00	6,336.50	45,077.87	4,422.13	0.00	4,422.13	8.9%
224.2100.52127	UNIFORMS	30,212.00	3,130.48	23,500.00	6,712.00	5,000.00	1,712.00	22.2%
224.2100.53111	DUES/SUPPLIES/IN	27,175.00	1,000.21	14,143.48	13,031.52	3,730.00	9,301.52	48%
224.2100.53113	TELEPHONE	15,072.50	973.69	11,738.64	3,333.86	492.50	2,841.36	22.1%
224.2100.53214	MAINTENANCE OF E	65,585.00	2,677.52	42,214.24	23,370.76	2,750.00	20,620.76	35.6%
224.2100.53218	UNIFORM MAINTENA	1,500.00	0.00	0.00	1,500.00	0.00	1,500.00	100%
224.2100.54111	MEDICAL DIRECTOR	6,548.62	0.00	6,548.62	0.00	0.00	0.00	0%
224.2100.54211	UTILITIES	42,300.00	1,898.51	21,335.38	20,964.62	3,200.00	17,764.62	49.6%
224.2100.54311	TRAINING/TRAVEL/	16,841.50	0.00	3,543.27	13,298.23	5,035.00	8,263.23	79%
224.2100.54312	TRAINING-CNG	0.00	0.00	0.00	0.00	0.00	0.00	0%
224.2100.54423	INSURANCE DEDUCT	1,000.00	0.00	0.00	1,000.00	0.00	1,000.00	100%
224.2100.54490	TRANSFER TO FIRE	580,000.00	180,000.00	500,000.00	80,000.00	0.00	80,000.00	13.8%
224.2100.55511	EQUIPMENT	106,327.50	8,402.68	89,357.50	16,970.00	4,661.00	12,309.00	16%
224.2100.55512	EQUIP-COVID-19	36,537.97	32,121.86	34,691.92	1,846.05	1,655.00	191.05	5.1%
224.2150.53111	DUES/SUPPLIES/IN	81,586.00	4,167.69	59,147.58	22,438.42	3,600.00	18,838.42	27.5%
224.2150.53214	MAINTENANCE OF E	54,611.52	14,584.02	38,515.48	16,096.04	12,685.00	3,411.04	29.5%
224.2150.54112	HEALTH & MEDICAL	7,234.00	0.00	2,736.30	4,497.70	0.00	4,497.70	62.2%
224.2150.54311	TRAINING/TRAVEL/	12,043.50	2,435.00	8,072.18	3,971.32	0.00	3,971.32	33%
224.2150.54423	INSURANCE DEDUCT	1,000.00	0.00	0.00	1,000.00	0.00	1,000.00	100%
224.2150.55511	EQUIPMENT	34,653.00	248.50	21,246.87	13,406.13	1,000.00	12,406.13	38.7%
224.3600.54113	STATE INCOME TAX	200.00	0.00	189.59	10.41	0.00	10.41	5.2%
224.3600.54455	LEASE/PURCHASE F	355,000.00	0.00	30,845.46	324,154.54	0.00	324,154.54	91.3%
TOTAL FIRE DEPARTMENT		3,390,428.11	780,998.77	2,508,302.56	882,125.55	44,305.78	837,819.77	26%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
TOTAL 1/2% INC TAX #2 FUND	5,662,159.25	1,237,121.00	4,323,633.22	1,338,526.03	108,995.64	1,229,530.39	23.6%
LOCAL CORNAVIRUS FUND							
225.1300.51111 PERSONNEL	923,343.23	923,343.23	923,343.23	0.00	0.00	0.00	0%
225.1300.53111 MATERIALS & SUPP	280,319.16	245,946.45	280,319.16	0.00	0.00	0.00	0%
225.1300.54111 CONTRACT SERVICE	29,954.16	370.46	29,954.16	0.00	0.00	0.00	0%
225.1300.54483 SMALL BUSINESS A	100,000.00	0.00	100,000.00	0.00	0.00	0.00	0%
TOTAL LOCAL CORONAVIRUS FUND	1,333,616.55	1,169,660.14	1,333,616.55	0.00	0.00	0.00	0%
301.1300.54484 TRANSFER WATER L	45,953.11	0.00	38,057.99	7,895.12	0.00	7,895.12	17.2%
301.1300.56525 CLOSING COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
301.1300.56621 BOND REDEMPTION	662,765.50	27,715.50	662,765.50	0.00	0.00	0.00	0%
301.1300.56622 BOND INTEREST	170,541.40	0.00	170,257.00	284.40	0.00	284.40	0.2%
301.3600.54112 COUNTY AUDITOR D	2,257.00	0.00	2,254.80	2.20	0.00	2.20	0.1%
TOTAL BOND RETIREMENT FUND	881,517.01	27,715.50	873,335.29	8,181.72	0.00	8,181.72	0.9%
302.1300.56525 CLOSING COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
302.1300.56621 SEWER SYSTEM BON	594,434.75	0.00	594,434.75	0.00	0.00	0.00	0%
302.1300.56622 SEWER SYSTEM BON	83,165.25	0.00	82,908.03	257.22	0.00	257.22	0.3%
TOTAL SEWER SYSTEM BOND RETIR	677,600.00	0.00	677,342.78	257.22	0.00	257.22	0%
303.1300.56525 CLOSING COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
303.1300.56621 WATER SYSTEM BON	105,626.00	4,675.45	105,625.90	0.10	0.00	0.10	0%
303.1300.56622 WATER SYSTEM BON	20,624.00	0.00	20,588.31	35.69	0.00	35.69	0.2%
303.1300.54484 TRANSFER TO BOND	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL WATER SYSTEM BOND RETIR	126,250.00	4,675.45	126,214.21	35.79	0.00	35.79	0%
304.1300.56621 BOND REDEMPTION	650.00	0.00	0.00	650.00	0.00	650.00	100%
305.1300.56621 BOND REDEMPTION	117,500.00	0.00	117,500.00	0.00	0.00	0.00	0%
305.1300.56622 BOND INTEREST	38,909.92	0.00	26,877.57	12,032.35	0.00	12,032.35	30.9%
TOTAL BOND RETIREMENT-INC TAX	156,409.92	0.00	144,377.57	12,032.35	0.00	12,032.35	7.7%
401.2500.55516 PUBLIC BUILDINGS	1,724,524.00	8,695.00	202,444.62	1,522,079.38	536.14	1,521,543.24	88.3%
401.2900.55514 STREET PAVING	0.00	0.00	0.00	0.00	0.00	0.00	0%
401.3600.54113 STATE INCOME TAX	100.00	0.00	73.91	26.09	0.00	26.09	26.1%
401.3600.54119 URBAN IMPROVEMEN	1,146,796.33	4,949.51	517,318.82	629,477.51	80,124.65	549,352.86	54.9%
401.3600.54451 COMPUTER	0.00	0.00	0.00	0.00	0.00	0.00	0%
401.3600.54452 COURT SECURITY	0.00	0.00	0.00	0.00	0.00	0.00	0%
401.3600.55511 EQUIPMENT	977,511.13	9,692.99	447,158.40	530,352.73	146,628.93	383,723.80	54.3%
401.3600.56525 NOTE CLOSING COS	0.00	0.00	0.00	0.00	0.00	0.00	0%
401.3600.56526 TRANSFER TO BOND	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL CAPITAL IMPROVEMENT FUN	3,848,931.46	23,337.50	1,166,995.75	2,681,935.71	227,289.72	2,454,645.99	69.7%
402.1300.54484 TIF-LOCAL SCHOOL	425,000.00	0.00	366,739.50	58,260.50	0.00	58,260.50	13.7%
402.1300.54485 TIF-TRANSFER TO	207,000.00	10,625.00	205,044.16	1,955.84	0.00	1,955.84	0.9%
402.1300.54490 ADVANCE REPAY TO	0.00	0.00	0.00	0.00	0.00	0.00	0%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
402.3600.54111 TIF-IMPROVEMENTS	4,361,066.50	85,019.80	788,182.84	3,572,883.66	17,197.60	3,555,686.06	81.9%
402.3600.54112 COUNTY AUDITOR D	40,000.00	0.00	26,091.77	13,908.23	0.00	13,908.23	34.8%
402.3600.54113 TIF-IMPROVEMENTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
402.3600.54115 TIF-CONTRACT ENG	350,966.25	475.90	66,588.63	284,377.62	12,547.27	271,830.35	81%
TOTAL TIF-COSHOCTON RD AREA	5,384,032.75	96,120.70	1,452,646.90	3,931,385.85	29,744.87	3,901,640.98	73%
403.2300.53111 DUES/SUPPLIES/IN	0.00	0.00	0.00	0.00	0.00	0.00	0%
403.2300.53312 MAINTENANCE & RE	0.00	0.00	0.00	0.00	0.00	0.00	0%
403.2300.54111 SERVICES RECEIVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
403.2300.54464 TAX LIEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
403.2300.55516 PUBLIC BUILDING-	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL B&O RAILROAD DEPOT	0.00	0.00	0.00	0.00	0.00	0.00	0%
404.1300.54485 TIF-TRANSFER TO	151,464.61	0.00	151,464.61	0.00	0.00	0.00	0%
404.3600.54111 TIF-IMPROVEMENTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
404.3600.54112 COUNTY AUDITOR D	2,700.00	0.00	2,493.00	207.00	0.00	207.00	7.7%
TOTAL TIF-INDUSTRIAL AREA	154,164.61	0.00	153,957.61	207.00	0.00	207.00	0.1%
405.1300.54485 TRANSFER TO BOND	226,965.50	13,965.50	226,620.27	345.23	0.00	345.23	0.2%
405.2900.55514 ROADS-ASPHALT	4,131,238.64	496,437.16	2,069,485.52	2,061,753.12	440,347.61	1,621,405.51	49.9%
405.2900.55516 ROADS-BRICK	997,329.00	0.00	0.00	997,329.00	0.00	997,329.00	100%
405.2900.55518 BRIDGES	23,577.88	0.00	0.00	23,577.88	22,334.15	1,243.73	100%
405.2900.55520 DRAINAGE	169,950.00	0.00	3,585.00	166,365.00	166,325.00	40.00	97.9%
405.3600.54113 STATE INCOME TAX	100.00	0.00	73.91	26.09	0.00	26.09	26.1%
405.3600.56526 NOTE CLOSING COS	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL ROADS & BRIDGES	5,549,161.02	510,402.66	2,299,764.70	3,249,396.32	629,006.76	2,620,389.56	58.6%
406.1300.54485 TIF-TRANSFER TO	0.00	0.00	0.00	0.00	0.00	0.00	0%
406.3600.54111 TIF-IMPROVEMENTS	37,229.83	0.00	0.00	37,229.83	0.00	37,229.83	100%
406.3600.54112 COUNTY AUDITOR D	400.00	0.00	310.37	89.63	0.00	89.63	22.4%
406.3600.54113 TIF-IMPROVEMENTS	0.00	0.00	0.00	0.00	0.00	0.00	0%
406.3600.54115 TIF-CONTRACT ENG	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL TIF-SANDUSKY ST CORRIDO	37,629.83	0.00	310.37	37,319.46	0.00	37,319.46	99.2%
601.3100.54452 MAUSOLEUM	1,864.61	0.00	0.00	1,864.61	0.00	1,864.61	100%
602.2100.56612 INSURANCE TRUST	78,209.14	31,977.81	39,488.81	38,720.33	30,720.33	8,000.00	49.5%
603.2400.56612 BONDS & INSPECTI	49,651.15	4,000.00	35,000.00	14,651.15	5,000.00	9,651.15	29.5%
604.2600.53312 MAINTENANCE & RE	65,990.18	44.54	565.60	65,424.58	44.54	65,380.04	99.1%
604.2600.54111 CONTRACT SERVICE	3,500.00	0.00	140.00	3,360.00	0.00	3,360.00	96%
TOTAL VETERAN'S HONOR WALK	69,490.18	44.54	705.60	68,784.58	44.54	68,740.04	99%
WATER REPLACEMENT & IMPROVEMN							

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
700.2700.54486	TRANSFER TO WATE	0.00	0.00	0.00	0.00	0.00	0.00	0%
700.2700.55511	WATER REPLACEMEN	500,060.96	0.00	0.00	500,060.96	0.00	500,060.96	100%
TOTAL WATER REPLACEMENT & IMP		500,060.96	0.00	0.00	500,060.96	0.00	500,060.96	100%
701.2700.51111	OFFICE ADMINISTR	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2700.51112	OFFICE REGULAR E	164,000.00	19,635.10	162,808.15	1,191.85	0.00	1,191.85	0.7%
701.2700.52124	UNEMPLOYMENT	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2700.52127	OFFICE UNIFORM R	974.00	0.00	674.74	299.26	0.00	299.26	30.7%
701.2700.53111	DUES/SUPPLIES/IN	57,121.00	1,887.53	48,830.02	8,290.98	3,178.00	5,112.98	14.5%
701.2700.53113	TELEPHONE	3,910.00	260.59	2,887.21	1,022.79	135.00	887.79	26.2%
701.2700.53214	MAINTENANCE - VE	3,970.00	153.59	2,988.30	981.70	425.00	556.70	24.7%
701.2700.53215	METER REPAIRS &	1,000.00	0.00	544.91	455.09	0.00	455.09	45.5%
701.2700.54111	SERVICES RECEIVE	788.00	0.00	41.67	746.33	0.00	746.33	94.7%
701.2700.54113	OFFICE COMPUTER	8,172.50	1,946.32	4,645.72	3,526.78	1,200.00	2,326.78	43.2%
701.2700.54311	TRAINING/TRAVEL/	1,005.83	0.00	92.50	913.33	50.00	863.33	90.8%
701.2700.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
701.2700.54452	OFFICE RENT	5,000.00	5,000.00	5,000.00	0.00	0.00	0.00	0%
701.2700.54465	OVERPAYMENT	4,809.81	0.00	4,246.85	562.96	0.00	562.96	11.7%
701.2700.54483	OFFICE EMERGENCY	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2700.55511	OFFICE EQUIPMENT	22,085.00	<1,450.00>	18,735.21	3,349.79	0.00	3,349.79	15.2%
701.2700.55521	NEW WATER/WASTEW	229,421.20	21,536.00	196,202.97	33,218.23	2,002.58	31,215.65	14.5%
701.2720.51111	PLANT EMPLOYEES	549,900.00	69,980.81	548,657.69	1,242.31	0.00	1,242.31	0.2%
701.2720.52127	PLANT UNIFORM RE	4,983.00	458.94	3,981.03	1,001.97	235.00	766.97	20.1%
701.2720.53111	DUES/SUPPLIES/IN	55,945.00	11,439.32	44,838.00	11,107.00	3,377.50	7,729.50	19.9%
701.2720.53113	TELEPHONE	6,015.00	495.54	5,912.87	102.13	15.00	87.13	1.7%
701.2720.53211	PLANT CHEMICALS	216,200.00	16,739.88	196,904.29	19,295.71	14,600.00	4,695.71	8.9%
701.2720.53214	MAINTENANCE - VE	4,200.00	272.58	2,455.73	1,744.27	560.00	1,184.27	41.5%
701.2720.53312	PLANT MAINTENANC	133,570.00	12,430.15	126,217.12	7,352.88	6,700.00	652.88	5.5%
701.2720.54115	PLANT SERVICES R	5,808.00	0.00	4,014.88	1,793.12	200.00	1,593.12	30.9%
701.2720.54116	REFUSE REMOVAL	1,100.00	87.74	1,006.96	93.04	0.00	93.04	8.5%
701.2720.54118	ENVIRONMENTAL CO	39,500.00	0.00	0.00	39,500.00	0.00	39,500.00	100%
701.2720.54211	PLANT UTILITIES	239,132.00	11,888.80	154,693.26	84,438.74	27,523.14	56,915.60	35.3%
701.2720.54311	TRAINING/TRAVEL/	1,240.83	277.83	862.83	378.00	267.50	110.50	30.5%
701.2720.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
701.2720.54464	TAX LIEN	555.00	0.00	550.50	4.50	0.00	4.50	0.8%
701.2720.55511	PLANT EQUIPMENT	13,000.00	0.00	3,417.05	9,582.95	5,458.51	4,124.44	73.7%
701.2720.55515	WATER WELLS & WE	7,000.00	0.00	0.00	7,000.00	0.00	7,000.00	100%
701.2740.51111	DISTRIBUTION EMP	264,500.00	30,843.51	264,158.80	341.20	0.00	341.20	0.1%
701.2740.53215	METER REPAIRS &	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2740.52127	UNIFORM RENTAL	4,523.00	99.25	3,611.77	911.23	455.00	456.23	20.1%
701.2740.53111	DUES/SUPPLIES/IN	1,300.00	26.25	1,263.38	36.62	0.00	36.62	2.8%
701.2740.53113	TELEPHONE	2,910.00	172.43	1,842.82	1,067.18	95.00	972.18	36.7%
701.2740.53214	MAINTENANCE - VE	29,909.40	1,354.79	20,520.49	9,388.91	1,965.33	7,423.58	31.4%
701.2740.53312	M&R-BUILDG	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2740.53313	NEW MAINTBLDG	13,360.00	79.13	2,886.50	10,473.50	4,734.72	5,738.78	78.4%
701.2740.54111	SERVICES RECEIVE	2,278.85	0.00	532.51	1,746.34	1,500.00	246.34	76.6%
701.2740.54116	REFUSE REMOVAL	550.00	43.87	503.48	46.52	0.00	46.52	8.5%
701.2740.54118	ENVIRONMENTAL CO	220,224.82	8,655.70	126,344.36	93,880.46	11,350.00	82,530.46	42.6%
701.2740.54123	STAND PIPE ENGIN	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2740.54124	ELEVATED TANK MA	1,786,487.21	3,795.00	39,072.05	1,747,415.16	1,640.00	1,745,775.16	97.8%
701.2740.54211	DISTRIBUTION UTI	51,012.00	3,277.24	35,001.06	16,010.94	4,387.57	11,623.37	31.4%
701.2740.54311	TRAINING/TRAVEL/	2,540.83	0.00	1,352.00	1,188.83	0.00	1,188.83	46.8%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
701.2740.54423 INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
701.2740.55511 DISTRIBUTION EQU	79,300.00	0.00	8,293.05	71,006.95	52,153.90	18,853.05	89.5%
701.2740.55512 HYDRANTS	29,500.00	0.00	687.54	28,812.46	0.00	28,812.46	97.7%
701.2740.55513 LINE IMPROVE OR	1,017,309.14	132,994.83	427,185.57	590,123.57	529,256.98	60,866.59	58%
701.2740.55514 LINE MAINTENANCE	125,246.93	20,294.22	88,071.62	37,175.31	6,500.00	30,675.31	29.7%
701.2740.55521 NEW WATER/WASTEW	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2760.54489 TRANSFER TO BOND	129,500.00	4,675.45	126,214.21	3,285.79	0.00	3,285.79	2.5%
701.2760.54490 TRANSFER TO WATE	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2760.56521 PRINCIPAL	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2760.56522 INTEREST	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2760.56523 TRUSTEE FEE	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2780.51111 EMPLOYEE FINAL P	19,124.85	0.00	17,368.20	1,756.65	0.00	1,756.65	9.2%
701.2780.52121 P E R S	143,000.00	10,589.71	129,036.16	13,963.84	10,200.00	3,763.84	9.8%
701.2780.52123 WORKERS COMPENSA	22,880.00	0.00	14,916.30	7,963.70	0.00	7,963.70	34.8%
701.2780.52124 UNEMPLOYMENT COM	625.15	0.00	72.12	553.03	0.00	553.03	88.5%
701.2780.52125 EMPLOYEES INSURA	336,300.00	19,261.07	306,417.15	29,882.85	0.00	29,882.85	8.9%
701.2780.52126 MEDICARE & SOCIA	14,250.00	1,628.22	13,545.64	704.36	0.00	704.36	4.9%
701.2780.54421 INSURANCE - LIAB	6,000.00	0.00	4,803.00	1,197.00	0.00	1,197.00	20%
701.2780.54425 INSURANCE - BOIL	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2780.54426 INSURANCE - AUTO	900.00	0.00	835.00	65.00	0.00	65.00	7.2%
701.2780.54466 TRANSFER TO WATE	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2780.54483 EMERGENCY RECOVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
701.2780.54484 TRANSFER AUDITOR	4,500.00	4,500.00	4,500.00	0.00	0.00	0.00	0%
701.2780.54485 TRANSFER ENGINEE	50,000.00	50,000.00	50,000.00	0.00	0.00	0.00	0%
701.2780.54486 TRANSFER TO WATE	656,828.11	0.00	0.00	656,828.11	0.00	656,828.11	100%
TOTAL WATER FUND	6,796,766.46	465,331.39	3,230,245.24	3,566,521.22	690,165.73	2,876,355.49	52.5%
702.2700.54111 WATER SYS IMPV-C	0.00	0.00	0.00	0.00	0.00	0.00	0%
702.2700.54112 WATER SYS IMPV-E	0.00	0.00	0.00	0.00	0.00	0.00	0%
702.2700.54113 WATER SYS IMPV-C	0.00	0.00	0.00	0.00	0.00	0.00	0%
702.2700.54114 WATER SYS IMP-BO	0.00	0.00	0.00	0.00	0.00	0.00	0%
702.2700.54489 TRANSFER-BOND RE	0.00	0.00	0.00	0.00	0.00	0.00	0%
702.2700.54490 WATER SYS IMP-TR	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL WATER SYS IMPV FUND	0.00	0.00	0.00	0.00	0.00	0.00	0%
703.2700.54490 TRANSFER TO WATE	0.00	0.00	0.00	0.00	0.00	0.00	0%
703.2700.55511 WATER REPLACEMEN	983,490.18	0.00	0.00	983,490.18	0.00	983,490.18	100%
703.2700.55513 WATER IMPROVEMEN	0.00	0.00	0.00	0.00	0.00	0.00	0%
704.2700.54492 WATER SERVICE (T	14,334.59	0.00	10,597.69	3,736.90	3,736.90	0.00	26.1%
705.2700.54486 TRANSFER TO BOND	0.00	0.00	0.00	0.00	0.00	0.00	0%
705.2700.54490 TRANSFER TO WATE	31,817.22	0.00	0.00	31,817.22	0.00	31,817.22	100%
706.2800.54492 SEWER SERVICE (T	14,576.64	0.00	11,643.03	2,933.61	2,933.61	0.00	20.1%
707.2800.54490 TRANSFER TO WW F	0.00	0.00	0.00	0.00	0.00	0.00	0%
707.2800.55513 SEWER IMPROVEMEN	644,242.87	0.00	93,383.30	550,859.57	45,055.00	505,804.57	85.5%
TOTAL WW IMPROVEMENT FUND	644,242.87	0.00	93,383.30	550,859.57	45,055.00	505,804.57	85.5%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
708.2800.54492 WASTEWATER SERVI	314,710.83	0.00	241,657.93	73,052.90	36,963.33	36,089.57	23.2%
STORM WATER FUND							
710.3210.53111 MATERIALS & SUPP	0.00	0.00	0.00	0.00	0.00	0.00	0%
710.3210.54118 ENVIRONMENTAL CO	0.00	0.00	0.00	0.00	0.00	0.00	0%
710.3210.55513 LINES, CHANNELS,	0.00	0.00	0.00	0.00	0.00	0.00	0%
710.3210.55514 LINE MAINTENANCE	0.00	0.00	0.00	0.00	0.00	0.00	0%
710.3210.55520 CATCH BAIN REPAI	0.00	0.00	0.00	0.00	0.00	0.00	0%
710.3210.55521 CURB & GUTTER RE	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL STORM WATER FUND	0.00	0.00	0.00	0.00	0.00	0.00	0%
711.2800.55511 EQUIPMENT REPLAC	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.54111 WW SYSTEM IMP -	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.54112 WW SYSTEM IMP -	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.54113 WW SYS IMP - CON	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.1300.54485 TRANSFER TO DEBT	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.54490 WW SYS IMP - TRA	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.56525 WW SYSTEM IMP-NO	0.00	0.00	0.00	0.00	0.00	0.00	0%
712.2800.54491 WW SYSTEM IMPV-T	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL WW SYSTEM IMP.	0.00	0.00	0.00	0.00	0.00	0.00	0%
713.2800.54486 TRANSFER TO BOND	0.00	0.00	0.00	0.00	0.00	0.00	0%
713.2800.54487 TRANSFER TO SEWE	0.00	0.00	0.00	0.00	0.00	0.00	0%
713.2800.54490 TRANSFER TO WAST	0.00	0.00	0.00	0.00	0.00	0.00	0%
TOTAL SEWER UTILITY RESERVE	0.00	0.00	0.00	0.00	0.00	0.00	0%
715.2700.54492 WATER SERVICE-CL	15,318.29	0.00	13,263.90	2,054.39	1,899.65	154.74	13.4%
720.2800.51111 OFFICE ADMINISTR	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2800.51112 OFFICE EMPLOYEES	164,000.00	19,635.10	162,807.16	1,192.84	0.00	1,192.84	0.7%
720.2800.52124 UNEMPLOYMENT COM	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2800.52127 OFFICE UNIFORM R	834.00	0.00	674.74	159.26	0.00	159.26	19.1%
720.2800.53111 DUES/SUPPLIES/IN	57,121.00	1,887.51	48,688.61	8,432.39	3,178.00	5,254.39	14.8%
720.2800.53113 TELEPHONE	3,910.00	260.59	2,887.18	1,022.82	135.00	887.82	26.2%
720.2800.53214 MAINTENANCE VEHI	3,970.00	153.59	2,988.25	981.75	425.00	556.75	24.7%
720.2800.53215 METER REPAIRS &	1,000.00	0.00	544.90	455.10	0.00	455.10	45.5%
720.2800.54111 SERVICE RECEIVED	788.00	0.00	41.67	746.33	0.00	746.33	94.7%
720.2800.54113 COMPUTER MAINTEN	8,172.50	1,946.32	4,645.72	3,526.78	1,200.00	2,326.78	43.2%
720.2800.54311 TRAINING/TRAVEL/	1,005.83	0.00	92.50	913.33	50.00	863.33	90.8%
720.2800.54423 INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
720.2800.54452 OFFICE RENT	5,000.00	5,000.00	5,000.00	0.00	0.00	0.00	0%
720.2800.54465 OVERPAYMENT	4,905.56	0.00	4,640.34	265.22	0.00	265.22	5.4%
720.2800.55511 OFFICE EQUIPMENT	22,085.00	<1,450.00>	18,735.21	3,349.79	0.00	3,349.79	15.2%
720.2800.55521 NEW WATER/WASTEW	228,571.20	21,536.00	195,352.97	33,218.23	2,002.58	31,215.65	14.5%
720.2820.51111 PLANT EMPLOYEES	644,620.00	83,511.23	637,244.48	7,375.52	0.00	7,375.52	1.1%
720.2820.52127 PLANT UNIFORM RE	5,723.00	181.21	5,376.74	346.26	35.00	311.26	6.1%

		Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
720.2820.53111	DUES/SUPPLIES/IN	93,092.50	7,455.80	41,002.15	52,090.35	4,213.78	47,876.57	56%
720.2820.53113	TELEPHONE	3,210.00	266.90	3,152.44	57.56	10.00	47.56	1.8%
720.2820.53211	PLANT CHEMICALS	21,200.00	0.00	12,865.21	8,334.79	0.00	8,334.79	39.3%
720.2820.53214	MAINTENANCE - VE	5,000.00	272.59	2,017.99	2,982.01	560.00	2,422.01	59.6%
720.2820.53312	PLANT MAINTENANC	326,437.38	20,174.46	149,101.01	177,336.37	94,599.01	82,737.36	54.3%
720.2820.54111	SERVICES RECEIVE	19,238.00	256.00	12,234.68	7,003.32	2,765.00	4,238.32	36.4%
720.2820.54114	SLUDGE REMOVAL	97,000.00	26,746.70	57,547.62	39,452.38	0.00	39,452.38	40.7%
720.2820.54115	SEPTAGE RECEIVIN	2,500.00	0.00	1,847.77	652.23	0.00	652.23	26.1%
720.2820.54116	REFUSE REMOVAL	1,200.00	87.74	1,006.96	193.04	0.00	193.04	16.1%
720.2820.54118	ENVIRONMENTAL CO	73,000.00	1,893.00	40,307.30	32,692.70	0.00	32,692.70	44.8%
720.2820.54211	PLANT UTILITIES	280,000.00	16,557.71	203,416.10	76,583.90	28,800.00	47,783.90	27.4%
720.2820.54311	TRAINING/TRAVEL/	2,005.84	117.83	933.20	1,072.64	267.50	805.14	53.5%
720.2820.54423	PLANT INSURANCE	500.00	0.00	0.00	500.00	0.00	500.00	100%
720.2820.54464	TAX LIEN	390.00	0.00	388.50	1.50	0.00	1.50	0.4%
720.2820.55511	PLANT EQUIPMENT	60,000.00	0.00	0.00	60,000.00	55,093.17	4,906.83	100%
720.2840.51111	COLLECTION EMPLO	136,080.00	15,888.86	135,994.10	85.90	0.00	85.90	0.1%
720.2840.53215	METER REPAIRS &	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2840.52127	UNIFORM RENTAL	4,523.00	99.25	3,611.71	911.29	455.00	456.29	20.1%
720.2840.53111	DUES/SUPPLIES/IN	1,300.00	26.24	1,163.25	136.75	0.00	136.75	10.5%
720.2840.53113	TELEPHONE	4,226.00	230.00	2,527.24	1,698.76	135.00	1,563.76	40.2%
720.2840.53214	MAINTENANCE - VE	29,909.40	1,354.77	17,473.26	12,436.14	1,965.32	10,470.82	41.6%
720.2840.53312	M&R BLDG	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2840.53313	NEW MAINTBLDG	13,860.00	79.13	2,845.59	11,014.41	4,734.72	6,279.69	79.5%
720.2840.54111	SERVICES RECEIVE	2,278.84	0.00	532.50	1,746.34	0.00	1,746.34	76.6%
720.2840.54116	REFUSE REMOVAL	550.00	43.87	503.48	46.52	0.00	46.52	8.5%
720.2840.54118	ENVIRONMENTAL CO	220,332.43	12,937.50	105,426.52	114,905.91	11,500.00	103,405.91	52.2%
720.2840.54211	COLLECTION UTILI	42,312.00	1,904.78	22,457.82	19,854.18	5,437.57	14,416.61	46.9%
720.2840.54311	TRAINING/TRAVEL/	2,540.84	0.00	1,352.00	1,188.84	0.00	1,188.84	46.8%
720.2840.54423	INSURANCE DEDUCT	500.00	0.00	0.00	500.00	0.00	500.00	100%
720.2840.54424	DAMAGE CLAIMS	1,500.00	0.00	0.00	1,500.00	0.00	1,500.00	100%
720.2840.55511	COLLECTION EQUIP	59,800.00	0.00	7,548.95	52,251.05	52,153.90	97.15	87.4%
720.2840.55513	LINE IMPROVE OR	100,400.00	692.16	12,268.51	88,131.49	24,958.00	63,173.49	87.8%
720.2840.55514	LINE MAINTENANCE	202,596.92	10,464.97	173,189.17	29,407.75	17,170.24	12,237.51	14.5%
720.2840.55521	NEW WATER/WASTEW	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2860.54486	TRANSFER TO BOND	700,000.00	0.00	677,342.78	22,657.22	0.00	22,657.22	3.2%
720.2860.56521	O W D A - PRINCI	347,917.94	0.00	347,917.90	0.04	0.00	0.04	0%
720.2860.56522	O W D A - INTERE	55,283.06	0.00	55,283.06	0.00	0.00	0.00	0%
720.2860.56523	TRUSTEE FEE	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2880.51111	EMPLOYEE FINAL P	36,624.85	0.00	34,262.77	2,362.08	0.00	2,362.08	6.4%
720.2880.52121	P E R S	142,900.00	9,794.26	124,062.62	18,837.38	10,600.00	8,237.38	13.2%
720.2880.52123	WORKERS COMPENSA	21,880.00	0.00	15,952.30	5,927.70	0.00	5,927.70	27.1%
720.2880.52124	UNEMPLOYMENT COM	625.15	0.00	72.12	553.03	0.00	553.03	88.5%
720.2880.52125	EMPLOYEES INSURA	402,200.00	23,861.50	372,160.65	30,039.35	0.00	30,039.35	7.5%
720.2880.52126	MEDICARE & SOCIA	14,500.00	1,780.25	13,943.20	556.80	0.00	556.80	3.8%
720.2880.54421	INSURANCE - LIAB	5,500.00	0.00	4,512.00	988.00	0.00	988.00	18%
720.2880.54425	INSURANCE - BOIL	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2880.54426	INSURANCE - AUTO	2,750.00	0.00	2,506.00	244.00	0.00	244.00	8.9%
720.2880.54484	TRANSFER AUDITOR	4,500.00	4,500.00	4,500.00	0.00	0.00	0.00	0%
720.2880.54485	TRANSFER ENGINEE	50,000.00	50,000.00	50,000.00	0.00	0.00	0.00	0%
720.2880.54486	ADVANCE TO CAPIT	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2880.54487	SEWER TRSFR TO S	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2880.54488	TRANSFER TO BOND	0.00	0.00	0.00	0.00	0.00	0.00	0%
720.2880.54489	TRANSFER TO SEWE	116,747.27	0.00	0.00	116,747.27	0.00	116,747.27	100%

	Combined Appropriations	Combined Month-to-date Expenses	Combined Year-to-date Expenses	Combined Unexpended Balance	Combined Encumbrances	Combined Unencumbered Amount	Comb Unexp Percent
TOTAL SEWER SYSTEM REVENUE FU	4,861,117.51	340,147.82	3,804,950.90	1,056,166.61	322,443.79	733,722.82	21.7%
801.3100.56611 PERPETUAL CARE	0.00	0.00	0.00	0.00	0.00	0.00	0%
901.3600.52122 POLICE PENSION	512,396.98	30,499.14	384,882.52	127,514.46	31,000.00	96,514.46	24.9%
901.3600.54112 COUNTY AUDITOR D	1,750.00	0.00	1,532.36	217.64	0.00	217.64	12.4%
901.3600.54113 STATE INCOME TAX	50.00	0.00	3.80	46.20	0.00	46.20	92.4%
TOTAL POLICE PENSION	514,196.98	30,499.14	386,418.68	127,778.30	31,000.00	96,778.30	24.9%
902.3600.52122 FIRE PENSION	928,554.84	51,635.67	671,819.39	256,735.45	55,000.00	201,735.45	27.6%
902.3600.54112 COUNTY AUDITOR D	1,750.00	0.00	1,532.35	217.65	0.00	217.65	12.4%
902.3600.54113 STATE INCOME TAX	50.00	0.00	3.80	46.20	0.00	46.20	92.4%
TOTAL FIRE PENSION	930,354.84	51,635.67	673,355.54	256,999.30	55,000.00	201,999.30	27.6%
GRAND TOTAL ALL FUNDS	60,287,860.49	3,841,390.06	34,541,265.21	25,746,595.28	2,828,035.42	22,918,559.86	42.7%

		Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol-lected Percent	Col-lected Percent
101.1200.41503	PARKS & RECREATION PROGRAMS	$ 5,500.00	$ 0.00	$ 0.00	$ 5,500.00	100%	0%
101.1200.41701	BILLARDS & POOL LICENSES	1,500.00	1,290.00	3,005.00	<1,505.00>	-100.2%	200.3%
101.1200.41702	VEHICLE LICENSES	0.00	0.00	0.00	0.00	0%	0%
101.1200.41703	OTHER LICENSES	0.00	0.00	411.00	<411.00>	0%	0%
101.1200.41903	OTHER MISCELLANEOUS REVENUE	109,000.00	109,229.10	119,819.20	<10,819.20>	-9.8%	109.9%
101.1300.41101	ADVANCE FROM COUNTY AUDITOR	0.00	0.00	0.00	0.00	0%	0%
101.1300.41102	REAL EST. & PUB. UTIL.PROP.TAX	592,800.00	0.00	641,564.68	<48,764.68>	-8.1%	108.2%
101.1300.41103	REA PRO TAX ROLLBACK HOMESTEAD	80,700.00	0.00	80,103.84	596.16	0.7%	99.3%
101.1300.41104	TANGIBLE PERSONAL PROPERTY TAX	0.00	0.00	0.00	0.00	0%	0%
101.1300.41105	TRAILER TAX	2,500.00	0.00	2,558.98	<58.98>	-2.3%	102.4%
101.1300.41106	PERSONAL PROPERTY TAX EXEMPTION	0.00	0.00	0.00	0.00	0%	0%
101.1300.41301	LOC GOV & INTG PRO TAX COUNTY	221,993.51	19,485.96	218,976.93	3,016.58	1.4%	98.6%
101.1300.41302	LOCAL GOVERNMENT FROM STATE	60,000.00	5,981.37	65,598.54	<5,598.54>	-9.2%	109.3%
101.1300.41303	ESTATE TAX	0.00	0.00	0.00	0.00	0%	0%
101.1300.41304	CIGARETTE LICENSES	800.00	37.50	973.12	<173.12>	-21.5%	121.6%
101.1300.41305	LIQUOR & BEER PERMITS	25,000.00	0.00	24,704.05	295.95	1.2%	98.8%
101.1300.41306	LODGING TAX	6,500.00	788.10	4,502.67	1,997.33	30.7%	69.3%
101.1300.41401	FIRE SERVICE CONTRACTS	835,000.00	0.00	815,103.03	19,896.97	2.4%	97.6%
101.1300.41402	GRANT PAYMENTS	433,301.91	53,976.56	398,489.59	34,812.32	8%	92%
101.1300.41403	EMS BILLING SERVICE	800,000.00	74,965.99	838,723.44	<38,723.44>	-4.7%	104.8%
101.1300.41710	FALSE ALARMS	0.00	0.00	0.00	0.00	0%	0%
101.1300.41801	INTEREST	350,000.00	2,923.16	149,570.83	200,429.17	57.3%	42.7%
101.1300.41901	SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
101.1300.41902	RENTAL	0.00	10,590.00	13,840.00	<13,840.00>	0%	0%
101.1300.41903	BICENTENNIAL COOKBOOKS	0.00	0.00	0.00	0.00	0%	0%
101.1300.41904	BICENTENNIAL EVENT	0.00	0.00	0.00	0.00	0%	0%
101.1300.41905	BICENTENTIAL LEGACY VIDEOS	0.00	0.00	0.00	0.00	0%	0%
101.1300.42101	TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
101.1300.42102	TRANSFER TO ESCROW ACCOUNT	0.00	0.00	0.00	0.00	0%	0%
101.1300.42201	REFUNDS & REIMBURSEMENTS	0.00	455,351.45	738,530.09	<738,530.09>	0%	0%
101.1600.41201	MUN. INCOME TAX 1% (UNVOTED)	4,171,560.00	257,126.70	3,567,335.93	604,224.07	14.5%	85.5%
101.1600.41202	MUN. INCOME TAX 1/2% (VOTED)	0.00	0.00	0.00	0.00	0%	0%
101.1700.41601	COURT FINES & FORFEITURES	106,681.00	3,630.00	75,088.55	31,592.45	29.6%	70.4%
101.1700.41602	COURT COSTS	453,000.00	30,779.53	448,039.04	4,960.96	1.1%	98.9%
101.1700.41604	COURT MISCELLANEOUS REVENUE	0.00	0.00	3,201.65	<3,201.65>	0%	0%
101.1780.41601	PROB EDUC/AWARENESS	20,554.88	0.00	1,195.36	19,359.52	94.2%	5.8%
101.1785.41402	P.I.I.G. PROB. GRANT	14,400.00	0.00	62,685.00	<48,285.00>	-335.2%	435.3%
101.1788.41402	GRANT-JRIG	150,000.00	0.00	188,055.00	<38,055.00>	-25.3%	125.4%
101.1900.41501	GENERAL GOVERNMENT FEES	0.00	0.00	38.00	<38.00>	0%	0%
101.1900.41502	IMPOUND-TOWING FEES	0.00	0.00	996.00	<996.00>	0%	0%
101.1900.41503	IMPOUND-STORAGE FEES	10,000.00	48.00	3,990.70	6,009.30	60.1%	39.9%
101.1900.41504	REFUSE HAULER'S INSPECTIONS	0.00	0.00	0.00	0.00	0%	0%
101.2300.41101	SPECIAL ASSESSMENT (MOWING)	10,000.00	0.00	18,802.33	<8,802.33>	-87.9%	188%
101.2300.41709	EMERGENCY ALARM PERMITS	0.00	0.00	0.00	0.00	0%	0%
101.2400.41704	BUILDING PERMITS	9,000.00	676.00	21,859.00	<12,859.00>	-142.8%	242.9%
101.2400.41705	STREET OPENING PERMITS	5,000.00	850.00	2,900.00	2,100.00	42%	58%
101.2400.41706	ZONING PERMITS	1,000.00	189.00	1,618.00	<618.00>	-61.7%	161.8%
101.2400.41707	OTHER PERMITS	1,500.00	50.00	1,200.00	300.00	20%	80%
101.2400.41708	ZONING APPEAL FEES	500.00	225.00	1,300.00	<800.00>	-159.9%	260%
101.2500.41501	LIGHT FEE FOR PLAZA BLDG.	0.00	0.00	0.00	0.00	0%	0%
101.2500.41502	ARBOR TRUST REVENUE	0.00	0.00	0.00	0.00	0%	0%
101.3450.41502	SWIMMING POOL	238,000.00	250.00	577.00	237,423.00	99.8%	0.2%
101.3450.41503	POOL CONCESSIONS	45,000.00	0.00	0.00	45,000.00	100%	0%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol-lected Percent	Col-lected Percent
101.3450.41504 STATE SALES TAX	4,000.00	0.00	0.00	4,000.00	100%	0%
TOTAL GENERAL FUND	8,764,791.30	1,028,443.42	8,515,356.55	249,434.75	2.8%	97.2%
201.1300.41402 GRANT PAYMENTS	0.00	0.00	0.00	0.00	0%	0%
201.1300.41801 INTEREST	0.00	0.83	83.76	<83.76>	0%	0%
201.2100.42101 ADVANCE FROM GENERAL FUND	0.00	0.00	0.00	0.00	0%	0%
201.2900.41201 MUN. INCOME TAX 3% OF 1%	239,978.00	13,399.10	191,292.57	48,685.43	20.3%	79.7%
201.2900.41301 STATE GASOLINE TAX	690,744.00	65,785.29	723,601.17	<32,857.17>	-4.7%	104.8%
201.2900.41302 STATE MOTOR VEHICLE LICENSE	110,000.00	9,280.13	104,567.69	5,432.31	4.9%	95.1%
201.2900.41303 3.3 GASOLINE TAX	0.00	0.00	0.00	0.00	0%	0%
201.2900.41707 STORMWATER PERMITS	1,500.00	200.00	5,435.89	<3,935.89>	-262.3%	362.4%
201.2900.41901 SALE OF ASSETS	0.00	0.00	837.13	<837.13>	0%	0%
201.2900.42201 REFUNDS & REIMBURSEMENTS	0.00	11,206.31	37,575.49	<37,575.49>	0%	0%
TOTAL STREET FUND	1,042,222.00	99,871.66	1,063,393.70	<21,171.70>	-1.9%	102%
202.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
202.2900.41301 7 1/2% OF GASOLINE TAX	66,150.00	5,333.94	58,670.35	7,479.65	11.3%	88.7%
202.2900.41302 7 1/2% OF MOTOR VEHICLE LIC.	9,500.00	752.45	8,478.51	1,021.49	10.8%	89.2%
202.2900.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
TOTAL STATE HIGHWAY IMPROVEMENT FUND	75,650.00	6,086.39	67,148.86	8,501.14	11.2%	88.8%
203.2900.41301 PERMISSIVE AUTO TAX	75,000.00	0.00	64,267.51	10,732.49	14.3%	85.7%
	75,000.00	0.00	64,267.51	10,732.49	14.3%	85.7%
204.3100.41201 MUN. INCOME TAX 4% OF 1%	319,970.00	17,865.46	255,056.76	64,913.24	20.3%	79.7%
204.3100.41501 COLLECTIONS	55,000.00	4,670.00	78,632.00	<23,632.00>	-42.9%	143%
204.3100.41801 INTEREST EARNED ON ESCROW	0.00	0.00	0.00	0.00	0%	0%
204.3100.41901 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
204.3100.42101 INTEREST FROM PERPETUAL CARE	200.00	28.29	1,957.03	<1,757.03>	-878.4%	978.5%
204.3100.42102 TRANSFER FROM GENERAL FUND	0.00	0.00	0.00	0.00	0%	0%
204.3100.42201 REFUNDS & REIMBURSEMENTS	0.00	5,137.00	15,863.47	<15,863.47>	0%	0%
TOTAL CEMETERY FUND	375,170.00	27,700.75	351,509.26	23,660.74	6.3%	93.7%
205.1300.41402 GRANT CONTRIBUTION-OPW	0.00	0.00	0.00	0.00	0%	0%
205.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
205.2300.41502 AMERIFLORA DONATIONS	0.00	0.00	0.00	0.00	0%	0%
205.2400.41501 COLLECTIONS	1,000.00	150.00	3,250.00	<2,250.00>	-224.9%	325%
205.2600.42101 TRANSFER FROM GENERAL	1,000.00	470.00	3,250.00	<2,250.00>	-224.9%	325%
TOTAL PARK DEVELOPMENT FUND	2,000.00	620.00	6,500.00	<4,500.00>	-224.9%	325%
206.1300.41401 GRANT PAYMENTS	1,116,661.00	0.00	888,164.00	228,497.00	20.5%	79.5%
206.1300.41801 C.D.B.G.-INTEREST ON REHAB	0.00	0.60	20.89	<20.89>	0%	0%
206.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
206.1300.42202 REFUNDS & REIMB (PROGRAM)	0.00	0.00	0.00	0.00	0%	0%
206.1300.42203 REFUNDS & REIMB (HOME)	0.00	0.00	17,720.33	<17,720.33>	0%	0%
TOTAL C.D.B.G. FUND	1,116,661.00	0.60	905,905.22	210,755.78	18.9%	81.1%
207.1200.41304 PERMITS	0.00	0.00	1,825.00	<1,825.00>	0%	0%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol- lected Percent	Col- lected Percent
207.1300.41901 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
207.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	508.69	<508.69>	0%	0%
207.1900.41301 COLLECTIONS STREET	0.00	0.00	0.00	0.00	0%	0%
207.1900.41302 COLLECTIONS GARAGE	0.00	0.00	0.00	0.00	0%	0%
207.1900.41303 COLLECTIONS TICKETS	6,000.00	40.00	1,930.00	4,070.00	67.8%	32.2%
207.1900.41305 RENTAL	0.00	0.00	0.00	0.00	0%	0%
207.1900.42102 TRANSFER FROM GENERAL FUND	15,000.00	0.00	7,500.00	7,500.00	50%	50%
TOTAL PARKING FUND	21,000.00	40.00	11,763.69	9,236.31	44%	56%
208.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	15,818.16	<15,818.16>	0%	0%
208.1600.41202 MUN. INCOME TAX 1/2% (VOTED)	4,185,225.00	241,825.71	3,386,249.42	798,975.58	19.1%	80.9%
TOTAL MUNI INC TAX 1/2% FUND	4,185,225.00	241,825.71	3,402,067.58	783,157.42	18.7%	81.3%
209.1900.41901 LAW ENFORCEMENT TRUST	0.00	0.00	0.00	0.00	0%	0%
	0.00	0.00	0.00	0.00	0%	0%
210.1900.41901 DRUG ENFORCEMENT TRUST	0.00	0.00	0.00	0.00	0%	0%
	0.00	0.00	0.00	0.00	0%	0%
211.2900.41302 P L R - 50% FROM COUNTY LIC	115,000.00	7,785.00	103,624.29	11,375.71	9.9%	90.1%
211.2900.42201 P L R REFUNDS & REIMBURSEMENTS	0.00	14.40	<24.73>	24.73	0%	0%
TOTAL PERMISSIVE LICENSE REGISTRATION	115,000.00	7,799.40	103,599.56	11,400.44	9.9%	90.1%
212.1700.41610 INDIGENT DRIVERS ALCOHOL FINES	12,000.00	260.50	8,853.57	3,146.43	26.2%	73.8%
212.1700.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
213.1700.41610 DUI ENFORCE. & EDUCATE FINES	500.00	0.00	86.00	414.00	82.8%	17.2%
214.1700.41602 MUNI COURT COMPUTER COSTS	16,500.00	891.00	13,848.00	2,652.00	16.1%	83.9%
215.1780.41601 PROBATION SERVICE FUND	52,000.00	2,624.50	44,027.40	7,972.60	15.3%	84.7%
215.1780.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	4,633.43	<4,633.43>	0%	0%
216.1700.41610 SPECIAL PROJECTS FEE	24,000.00	1,270.00	20,455.30	3,544.70	14.8%	85.2%
TOTAL SPECIAL PROJECTS FUND	24,000.00	1,270.00	20,455.30	3,544.70	14.8%	85.2%
217.1300.41401 GRANT PAYMENTS	149,771.69	0.00	149,771.69	0.00	0%	100%
218.1700.41602 COURT CLERK COMPUTER COSTS	60,000.00	3,025.00	46,604.99	13,395.01	22.3%	77.7%
218.1700.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
218.1700.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
219.1300.41501 LODGING EXCISE TAX	124,000.00	4,653.96	75,881.42	48,118.58	38.8%	61.2%
TOTAL LODGING EXCISE TAX	124,000.00	4,653.96	75,881.42	48,118.58	38.8%	61.2%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol- lected Percent	Col- lected Percent
220.1700.41601 DRIVERS INTERLOCK & ALCOHOL MONI	10,000.00	572.16	13,326.23	<3,326.23>	-33.2%	133.3%
220.1700.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
TOTAL DRIVERS INTERLOCK & ALCO	10,000.00	572.16	13,326.23	<3,326.23>	-33.2%	133.3%
221.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
221.1900.41501 CAB VEHICLE LICENSES	0.00	0.00	0.00	0.00	0%	0%
221.1900.41502 CAB OPERATOR LICENSE	400.00	0.00	210.00	190.00	47.5%	52.5%
TOTAL PUBLIC SERVICE STREET RE	400.00	0.00	210.00	190.00	47.5%	52.5%
222.1300.41402 PUBLIC DONATIONS	0.00	0.00	0.00	0.00	0%	0%
TOTAL WATER PK SCHOLARSHIP FUN	0.00	0.00	0.00	0.00	0%	0%
223.1300.41501 LODGING EXCISE TAX - 10%	10,000.00	1,398.30	7,588.13	2,411.87	24.1%	75.9%
223.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	154.80	<154.80>	0%	0%
TOTAL AVAILABLE PEITION FUND	10,000.00	1,398.30	7,742.93	2,257.07	22.6%	77.4%
224.1300.41401 GRANT PAYMENTS	500.00	0.00	500.00	0.00	0%	100%
224.1300.41402 GRANT PAYMENTS	49,985.97	3,737.25	53,723.22	<3,737.25>	-7.4%	107.5%
224.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	121,561.07	242,106.00	<242,106.00>	0%	0%
224.1600.41202 INCOME TAX #2 1/2% (VOTED)	4,185,225.00	241,825.71	3,386,249.42	798,975.58	19.1%	80.9%
224.1900.41502 IMPOUND-TOWING FEES	13,000.00	180.00	4,860.00	8,140.00	62.6%	37.4%
224.1900.41504 WASTE HAULING FEE	0.00	0.00	175.00	<175.00>	0%	0%
224.1900.41505 GOLF CART INSPECTIONS	0.00	25.00	75.00	<75.00>	0%	0%
224.1900.41901 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
224.2100.41901 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
TOTAL INC TAX #2 (VOTED)	4,248,710.97	367,329.03	3,687,688.64	561,022.33	13.2%	86.8%
CORONAVIRUS RELIEF FUND						
225.1300.41401 GRANT PAYMENT	1,333,616.55	0.00	1,333,501.04	115.51	0%	100%
225.1300.41801 INTEREST	0.00	93.92	153.96	<153.96>	0%	0%
TOTAL CORONAVIRUS RELIFE FUND	1,333,616.55	93.92	1,333,655.00	<38.45>	0%	100%
301.1300.41102 PROPERTY TAX	61,500.00	0.00	40,312.79	21,187.21	34.5%	65.5%
301.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
301.1300.42101 TRANSFERS	820,017.00	27,715.50	833,022.58	<13,005.58>	-1.5%	101.6%
301.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
301.1300.42300 SALE OF BONDS	0.00	0.00	0.00	0.00	0%	0%
301.1300.42301 SALE OF NOTES	0.00	0.00	0.00	0.00	0%	0%
301.1300.42303 PREMIUM ON SALE OF NOTES/BONDS	0.00	0.00	0.00	0.00	0%	0%
TOTAL BOND RETIREMENT FUND	881,517.00	27,715.50	873,335.37	8,181.63	0.9%	99.1%
302.1300.42101 TRANSFER FROM SEWER SYSTEM	677,600.00	0.00	677,342.78	257.22	0%	100%
302.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
302.1300.42301 SALE OF BONDS	0.00	0.00	0.00	0.00	0%	0%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol- lected Percent	Col- lected Percent
TOTAL SEWER SYSTEM BOND FUND	677,600.00	0.00	677,342.78	257.22	0%	100%
303.1300.42101 TRANSFER FROM WATER SYSTEM	126,250.00	4,675.45	126,214.21	35.79	0%	100%
303.1300.42301 SALE OF BONDS	0.00	0.00	0.00	0.00	0%	0%
TOTAL WATER SYSTEM BOND FUND	126,250.00	4,675.45	126,214.21	35.79	0%	100%
304.1300.42201 REFUNDS & REIMBURSEMENTS/BONDS O	0.00	0.00	0.00	0.00	0%	0%
TOTAL WATERWORKS-1976 BOND RET	0.00	0.00	0.00	0.00	0%	0%
305.1300.41201 MUN. INCOME TAX (UNVOTED)	144,375.00	12,139.13	144,481.78	<106.78>	0%	100.1%
305.1300.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
TOTAL BOND RETIREMENT-INC TAX	144,375.00	12,139.13	144,481.78	<106.78>	0%	100.1%
401.1300.41201 MUN. INCOME TAX 10% OF 1%	1,560,000.00	87,094.15	1,243,401.70	316,598.30	20.3%	79.7%
401.1300.41401 GRANT CONTRIBUTIONS	641,599.00	4,702.03	559,575.91	82,023.09	12.8%	87.2%
401.1300.41402 PUBLIC CONTRIBUTION	0.00	0.00	0.00	0.00	0%	0%
401.1300.41403 LOAN CONTRIBUTION-OPWC	0.00	0.00	0.00	0.00	0%	0%
401.1300.41801 INTEREST ON ESCROW ACCOUNT	0.00	0.00	0.00	0.00	0%	0%
401.1300.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
401.1300.42102 ADVANCES	0.00	0.00	0.00	0.00	0%	0%
401.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
401.1300.42301 SALE OF NOTES	0.00	0.00	0.00	0.00	0%	0%
TOTAL CAPITAL IMPROVEMENT FUND	2,201,599.00	91,796.18	1,802,977.61	398,621.39	18.1%	81.9%
402.1300.41102 PROPERTY TAX	1,475,000.00	0.00	1,359,689.94	115,310.06	7.8%	92.2%
402.1300.41103 REA PRO TAX ROLLBACK HOMESTEAD	0.00	0.00	0.00	0.00	0%	0%
402.1300.41401 GRANT CONTRIBUTION-ODOT	0.00	0.00	0.00	0.00	0%	0%
402.1300.41402 GRANT CONTRIBUTION-OPW	0.00	0.00	0.00	0.00	0%	0%
402.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
402.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	12,200.00	<12,200.00>	0%	0%
402.1300.42301 SIB LOAN PROCEEDS	0.00	0.00	0.00	0.00	0%	0%
402.1300.42302 PROCEEDS OF NOTES	0.00	0.00	0.00	0.00	0%	0%
402.1300.42101 ADVANCE FROM GENERAL FUND	0.00	0.00	0.00	0.00	0%	0%
TOTAL TIF DISTRICT-COSHOCTON R	1,475,000.00	0.00	1,371,889.94	103,110.06	7%	93%
403.1300.41402 PUBLIC CONTRIBUTIONS	0.00	0.00	0.00	0.00	0%	0%
403.1300.41903 OTHER MISCELLANEOUS REVENUE	0.00	0.00	0.00	0.00	0%	0%
TOTAL B&O RAILROAD DEPOT	0.00	0.00	0.00	0.00	0%	0%
404.1300.41102 PROPERTY TAX	154,085.36	0.00	154,085.36	0.00	0%	100%
TOTAL TIF-INDUSTRIAL AREA	154,085.36	0.00	154,085.36	0.00	0%	100%
405.1300.41402 GRANT PAYMENTS	2,416,327.14	210,407.39	620,300.16	1,796,026.98	74.3%	25.7%
405.1300.41801 INTEREST	0.00	66.60	3,335.87	<3,335.87>	0%	0%
405.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	110.42	<110.42>	0%	0%
405.1300.42301 BOND PROCEEDS	0.00	0.00	0.00	0.00	0%	0%
405.1600.41201 MUN. INCOME TAX 1% (UNVOTED)	1,560,000.00	87,094.15	1,243,401.70	316,598.30	20.3%	79.7%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol- lected Percent	Col- lected Percent
TOTAL ROADS & BRIDGE FUND	3,976,327.14	297,568.14	1,867,148.15	2,109,178.99	53%	47%
406.1300.41102 PROPERTY TAX	25,000.00	0.00	11,078.15	13,921.85	55.7%	44.3%
406.1300.41401 GRANT CONTRIBUTION-ODOT	0.00	0.00	0.00	0.00	0%	0%
406.1300.41402 GRANT CONTRIBUTION-OPWC	0.00	0.00	0.00	0.00	0%	0%
406.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
406.1300.42302 PROCEEDS OF NOTES	0.00	0.00	0.00	0.00	0%	0%
TOTAL TIF-SANDUKSY ST CORRIDOR	25,000.00	0.00	11,078.15	13,921.85	55.7%	44.3%
601.1300.41801 INTEREST	0.00	0.12	7.42	<7.42>	0%	0%
601.3100.41501 COLLECTIONS	0.00	0.00	390.00	<390.00>	0%	0%
TOTAL MAUSOLEUM FUND	0.00	0.12	397.42	<397.42>	0%	0%
602.1300.41901 INSURANCE RETAINAGE	41,977.81	31,977.81	33,977.81	8,000.00	19.1%	80.9%
TOTAL INSURANCE RETAINAGE	41,977.81	31,977.81	33,977.81	8,000.00	19.1%	80.9%
603.2400.41901 BONDS POSTED	25,000.00	1,000.00	16,000.00	9,000.00	36%	64%
604.2600.41501 COLLECTIONS	500.00	0.00	350.00	150.00	30%	70%
604.2600.41801 INTEREST	50.00	3.80	271.21	<221.21>	-442.3%	542.4%
TOTAL VETERAN'S HONOR WALK	550.00	3.80	621.21	<71.21>	-12.8%	112.9%
700.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
700.2700.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
WATER REPLACE & IMPROVE FUND	0.00	0.00	0.00	0.00	0%	0%
701.1300.41801 INTEREST	0.00	17.97	214.85	<214.85>	0%	0%
701.1300.42101 TRANSFER TO ESCROW ACCOUNT	0.00	0.00	0.00	0.00	0%	0%
701.2700.41500 ON ACCOUNT COLLECTIONS (CONTRA)	0.00	<1,635.49>	18,085.19	<18,085.19>	0%	0%
701.2700.41501 USER CHARGES	4,200,000.00	329,271.25	4,124,712.16	75,287.84	1.8%	98.2%
701.2700.41502 FIRE LINE PAYMENTS	65,000.00	7,541.83	70,806.80	<5,806.80>	-8.8%	108.9%
701.2700.41503 TAPS & CONNECTIONS	35,000.00	28,396.61	65,660.54	<30,660.54>	-87.5%	187.6%
701.2700.41504 OUT-OF-CITY SURCHARGE 25%	0.00	0.00	0.00	0.00	0%	0%
701.2700.41505 WATER CAPACITY CHARGE	20,000.00	8,800.00	34,550.00	<14,550.00>	-72.7%	172.8%
701.2700.41901 OTHER REVENUE	25,000.00	<2,770.80>	23,105.37	1,894.63	7.6%	92.4%
701.2700.41902 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
701.2700.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
701.2700.42201 REFUNDS & REIMBURSEMENTS	0.00	19,905.00	64,323.92	<64,323.92>	0%	0%
701.2700.42301 PROCEEDS OF NOTE SALE	0.00	0.00	0.00	0.00	0%	0%
TOTAL WATER FUND	4,345,000.00	389,526.37	4,401,458.83	<56,458.83>	-1.2%	101.3%
702.1300.41402 GRANT PAYMENTS	0.00	0.00	0.00	0.00	0%	0%
702.2700.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
702.2700.41802 INTEREST EARNED ON ESCROW ACCOUN	0.00	0.00	0.00	0.00	0%	0%
702.2700.42101 TRANSFER FROM WATER FUND	0.00	0.00	0.00	0.00	0%	0%
702.2700.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
702.2700.42301 PROCEEDS OF BONDS	0.00	0.00	0.00	0.00	0%	0%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol-lected Percent	Col-lected Percent
TOTAL WATER SYSTEM IMPROVEMENT	0.00	0.00	0.00	0.00	0%	0%
703.2700.41501 COLLECTIONS	215,000.00	16,675.53	208,068.18	6,931.82	3.2%	96.8%
703.2700.41504 USER CHARGES	50,000.00	3,697.17	74,094.64	<24,094.64>	-48.1%	148.2%
	265,000.00	20,372.70	282,162.82	<17,162.82>	-6.4%	106.5%
704.2700.41501 COLLECTIONS 15%	9,500.00	716.02	10,480.80	<980.80>	-10.2%	110.3%
	9,500.00	716.02	10,480.80	<980.80>	-10.2%	110.3%
705.2700.42101 TRANSFERS FROM WATER FUND	0.00	0.00	0.00	0.00	0%	0%
	0.00	0.00	0.00	0.00	0%	0%
706.2800.41501 COLLECTIONS 37 1/2%	9,500.00	774.18	11,433.94	<1,933.94>	-20.3%	120.4%
707.2800.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
707.2800.41501 COLLECTIONS 62 1/2%	155,000.00	12,509.93	157,577.69	<2,577.69>	-1.6%	101.7%
TOTAL WASTEWATER IMPVT FUND	155,000.00	12,509.93	157,577.69	<2,577.69>	-1.6%	101.7%
708.2800.41501 COLLECTIONS 15%-CLINTON	260,000.00	18,312.13	223,910.43	36,089.57	13.9%	86.1%
STORM WATER						
710.2710.41500 ON ACCOUNT COLLECTIONS (CONTRA)	0.00	0.00	0.00	0.00	0%	0%
710.2710.41501 USER FEES	0.00	60,950.37	234,010.48	<234,010.48>	0%	0%
710.2710.41707 PERMITS	0.00	0.00	0.00	0.00	0%	0%
710.2710.41901 OTHER INCOME	0.00	0.00	0.00	0.00	0%	0%
TOTAL STORM WATER	0.00	60,950.37	234,010.48	<234,010.48>	0%	0%
711.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
711.2800.42101 TRANSFER FROM SEWER	0.00	0.00	0.00	0.00	0%	0%
711.2800.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
711.2800.44490 TRANSFER-SEWER EQUIP REPL RESV	0.00	0.00	0.00	0.00	0%	0%
TOTAL SEWER SYSTEM REPL & IMPROVEMENT	0.00	0.00	0.00	0.00	0%	0%
712.2800.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
712.2800.42101 TRANSFER FROM SEWER SYSTEM UTIL	0.00	0.00	0.00	0.00	0%	0%
712.2800.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
712.2800.42301 PROCEEDS OF NOTES	0.00	0.00	0.00	0.00	0%	0%
TOTAL SEWER SYSTEM CONSTRUCTION & IMPROVEMENT	0.00	0.00	0.00	0.00	0%	0%
713.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
713.1300.42101 TRANSFER FROM SEWER SYSTEM	0.00	0.00	0.00	0.00	0%	0%
TOTAL SEWER SYSTEM UTILITY RESERVE	0.00	0.00	0.00	0.00	0%	0%
715.2700.41501 WATER SERVICE-CLINTON	12,500.00	834.87	12,345.26	154.74	1.2%	98.8%

	Estimated Revenue	Month-to-date Actual Revenue	Year-to-date Actual Revenue	Uncollected Balance	Uncol- lected Percent	Col- lected Percent
720.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
720.2800.41501 USER CHARGE	3,649,000.00	293,838.89	3,657,583.03	<8,583.03>	-0.1%	100.2%
720.2800.41502 DEBT SERVICE CHARGE	0.00	0.00	0.00	0.00	0%	0%
720.2800.41503 PENALTIES	0.00	0.00	0.00	0.00	0%	0%
720.2800.41504 TAPS & CONNECTIONS	10,000.00	0.00	1,345.00	8,655.00	86.6%	13.5%
720.2800.41505 WASTEWATER CAPACITY CHARGE	10,000.00	10,230.00	24,212.10	<14,212.10>	-142%	242.1%
720.2800.41506 SEPTAGE RECEIVING FEES	45,000.00	0.00	0.00	45,000.00	100%	0%
720.2800.41901 OTHER REVENUE	11,000.00	3,146.46	17,794.74	<6,794.74>	-61.7%	161.8%
720.2800.41902 SALE OF ASSETS	0.00	0.00	0.00	0.00	0%	0%
720.2800.42101 TRANSFERS	0.00	0.00	0.00	0.00	0%	0%
720.2800.42201 REFUNDS & REIMBURSEMENTS	0.00	20,424.00	64,199.29	<64,199.29>	0%	0%
720.2800.42301 PROCEEDS OF NOTE SALE	0.00	0.00	0.00	0.00	0%	0%
720.2800.44490 TRANSFER FROM WASTEWATER FUND	0.00	0.00	0.00	0.00	0%	0%
TOTAL SEWER SYSTEM REVENUE FUND	3,725,000.00	327,639.35	3,765,134.16	<40,134.16>	-1%	101.1%
801.1300.41801 INTEREST	0.00	0.00	0.00	0.00	0%	0%
801.3100.41501 ENDOWMENTS	10,000.00	1,060.00	19,460.00	<9,460.00>	-94.5%	194.6%
TOTAL PERPETUAL CARE FUND	10,000.00	1,060.00	19,460.00	<9,460.00>	-94.5%	194.6%
901.1300.41101 REAL EST. & PUB. UTIL.PROP.TAX	68,500.00	0.00	74,370.77	<5,870.77>	-8.5%	108.6%
901.1300.41103 REA PRO TAX ROLLBACK HOMESTEAD	9,400.00	0.00	9,361.60	38.40	0.4%	99.6%
901.1300.41201 MUN. INCOME TAX 1% OF 1%	80,000.00	4,466.37	63,764.19	16,235.81	20.3%	79.7%
901.1300.42101 TRANSFERS FROM 1/2% VOTED #2	286,405.00	65,000.00	245,000.00	41,405.00	14.5%	85.5%
901.1300.42102 TRANSFER FROM C.O.P.S. FUND	0.00	0.00	0.00	0.00	0%	0%
901.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	2,667.18	<2,667.18>	0%	0%
TOTAL POLICE PENSION FUND	444,305.00	69,466.37	395,163.74	49,141.26	11.1%	88.9%
902.1300.41101 REAL EST. & PUB. UTIL.PROP.TAX	68,500.00	0.00	74,370.77	<5,870.77>	-8.5%	108.6%
902.1300.41103 REA PRO TAX ROLLBACK HOMESTEAD	9,400.00	0.00	9,361.59	38.41	0.4%	99.6%
902.1300.41201 MUN. INCOME TAX 1% OF 1%	80,000.00	4,466.37	63,764.19	16,235.81	20.3%	79.7%
902.1300.42101 TRANSFERS FROM 1/2% VOTED #2	591,405.00	180,000.00	500,000.00	91,405.00	15.5%	84.5%
902.1300.42201 REFUNDS & REIMBURSEMENTS	0.00	0.00	0.00	0.00	0%	0%
TOTAL FIRE PENSION FUND	749,305.00	184,466.37	647,496.55	101,808.45	13.6%	86.4%
GRAND TOTAL ALL FUNDS	41,528,609.82	3,348,011.09	37,138,481.02	4,390,128.80	10.6%	89.4%

City of Mount Vernon - Wastewater Service Charges
Effective MARCH 1, 2021

			IN CITY	OUT OF CITY
	Wastewater Service Availability Charge			
	Meter Size	**Capacity Factor**	**Monthly Meter Charge**	**Monthly Meter Charge**
Monthly	*5/8"-3/4"*	1.00	$22.56	$31.58
	1"	1.35	$30.46	$42.64
	1½"	3.10	$69.94	$97.92
	2"	5.40	$121.82	$170.55
	3"	12.30	$277.49	$388.49
	4"	21.90	$494.06	$691.68
	6"	49.10	$1,107.70	$1,550.78
	8"	87.20	$1,967.23	$2,754.12

Notes: IN CITY
Usage computed as WWSAC charge for first 400 cubic feet and $5.64 per 100 cubic feet charged for all over 400 cubic feet.

In City flat rate connected without water access = $33.29

Notes: OUT OF CITY
Usage computed as WWSAC charge for first 400 cubic feet and $7.90 per 100 cubic feet charged for all over 400 cubic feet.

Out of City flat rate charge per unit is $46.61 (sewer connected, not metered)

Clinton Township charge is either minimum, metered or flat rate plus Clinton charge of $15.40
Services may also be billed by meter size minimums or by number of existing units.

City of Mount Vernon, 40 Public Square, Mount Vernon, Ohio 43050

City Council Ordinance 2020-39

25-Jan-21

Wastewater, Water, and Stormwater Rate Information

Wastewater

In November 2020, the City of Mount Vernon Utilities Commission recommended a wastewater rate increase to City Council; it was passed by council on January 25th, 2021 and will take effect on March 1st, 2021. The increase will be 15% of the current cubic feet charge for the next three years. Rates will be reviewed annually by City Council and adjusted if necessary. The rate increase is needed to help reduce budgetary deficits, fund much needed infrastructure updates, and address costs associated with the Ohio EPA-mandated phosphorus removal and Clinton Road SSO elimination projects.

Effective Date	Rate Increase % per 100 cubic feet	Rate Increase $ amount per 100 cubic feet	Minimum fee for 400 cubic feet
March 1, 2021	15%	$0.74	$22.56
January 1, 2022	15%	$0.84	$25.92
January 1, 2023	15%	$0.97	$29.80

Water

The minimum water fee in the city limits is $23.76 (400 cubic feet at a rate of $5.94/100 cubic feet). The water fees collected are used to operate the water treatment plant and fund water infrastructure projects. In 2020 the revenue from fees collected ensured the completion of the Newark Road and Dixie Drive waterline extension, the Venture Drive waterline extension, and the Northwest neighborhood waterline improvements projects. The department is now kicking off 2021 by replacing a water line along N Sandusky Street.

Stormwater

The Stormwater Utility went into effect in July 2020 at $4.00/month per 1 ERU (Equivalent Residential Unit). This charge increased to $5.00/ERU in January 2021, and will increase to $6.00/ERU in January 2022, where it will remain unless adjusted by City Council. Residential landowners pay for 1 ERU per month, and commercial properties pay based on their square footage over 1 ERU (1 ERU=2,900 square feet). This charge allows the City to have a consistent budget that is allocated strictly to projects related to stormwater infrastructure. Before this utility, Stormwater projects took approximately 40% of the Street department budget. Stormwater charges will be used to meet stormwater regulatory requirements and provide drainage and flooding mitigation improvements. The key aspect of this utility is that it will allow the City to become proactive instead of reactive when it comes to the repair and maintenance of the stormwater system.

Want to Learn More?

- Information and updates can be found at *The City of Mount Vernon* Facebook page, on Twitter @*CityMV1805*, and at MountVernonOhio.org.

REGULATORY AGENCY CORRESPONDENCE

June 25th, 2021

Natural Heritage Program
Department of Environmental Review
Division of Natural Resources
2045 Morse Rd, Building D
Columbus, OH 43229

Submitted Via Email: Environmentalreviewrequest@dnr.ohio.gov

To Whom It May Concern:

Subject: City of Mount Vernon – Wastewater Treatment Plant Improvements
Mount Vernon, Knox County, Ohio
CEC Project 310-731

The City of Mount Vernon Ohio (Knox County) are preparing to submit funding applications through USACE and OEPA for a Wastewater Treatment Plant improvement project. Parts of the Wastewater Treatment Plant are nearing the end of their useful life and are in need of replacement.

This Project will involve the replacement of the existing Digester Mixing and roofing systems, existing digester heat exchangers, the addition of solids handling and dewatering equipment, and the addition of chemical phosphorus removal in the primary influent and process sidestreams. The proposed project will take place solely on property currently owned by the Wastewater Trreatment plant and the city and no additional land purchases are to be expected with this project. No Stream Crossings or land clearings are expected to be completed with this project.

Civil & Environmental Consultants, Inc. requests that the Division of Natural Resources retrieve and compile information pertaining to rare/threatened/endangered species and wetlands for the indicated areas.

Please invoice our client at the address shown below:

City of Mount Vernon
40 Public Square
Mount Vernon, Ohio 43050

Should you have any questions or require additional information, please contact our office. Your assistance is greatly appreciated.

Sincerely,
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Zach Weaver, EI
Project Consultant

Travis W. Adams
Senior Project Manager

June 25, 2021

Ms. Patrice Ashfield
Field Supervisor
U.S. Fish and Wildlife Service
4625 Morse Road, Suite 104
Columbus, OH 43230

Dear Ms. Douglas:

Subject: City of Mount Vernon – Wastewater Treatment Plant Improvements
Mount Vernon, Knox County, Ohio
CEC Project 310-731

The City of Mount Vernon Ohio (Knox County) are preparing to submit funding applications through USACE and OEPA for a Wastewater Treatment Plant improvement project. Parts of the Wastewater Treatment Plant are nearing the end of their useful life and are in need of replacement.

This Project will involve the replacement of the existing Digester Mixing and roofing systems, existing digester heat exchangers, the addition of solids handling and dewatering equipment, and the addition of chemical phosphorus removal in the primary influent and process sidestreams. The proposed project will take place solely on property currently owned by the Wastewater Trreatment plant and the city and no additional land purchases are to be expected with this project. No Stream Crossings or land clearings are expected to be completed with this project.

Civil & Environmental Consultants, Inc. requests that U.S Fish and Wildlife Service retrieve and compile information pertaining to rare/threatened/endangered species and wetlands for the indicated areas.

Should you have any questions or require additional information, please contact our office. Your assistance is greatly appreciated.

Sincerely,
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Zach Weaver, EI
Project Consultant

Travis W. Adams
Senior Project Manager

June 25, 2021

Huntington District Corps of Engineers
502 8th Street
Regulatory Branch
Huntington, WV 25701

Subject: City of Mount Vernon – Wastewater Treatment Plant Improvements
Mount Vernon, Knox County, Ohio
CEC Project 310-731

The City of Mount Vernon Ohio (Knox County) are preparing to submit funding applications through USACE and OEPA for a Wastewater Treatment Plant improvement project. Parts of the Wastewater Treatment Plant are nearing the end of their useful life and are in need of replacement.

This Project will involve the replacement of the existing Digester Mixing and roofing systems, existing digester heat exchangers, the addition of solids handling and dewatering equipment, and the addition of chemical phosphorus removal in the primary influent and process sidestreams. The proposed project will take place solely on property currently owned by the Wastewater Trreatment plant and the city and no additional land purchases are to be expected with this project. No Stream Crossings or land clearings are expected to be completed with this project.

Civil & Environmental Consultants, Inc. requests that the U.S. Army Corps of Engineers review the project areas to determine if any wetlands, etc. might be affected and provide guidance as to whether any specific permits will be required.

Should you have any questions or require additional information, please contact our office. Your assistance is greatly appreciated.

Sincerely,
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Zach Weaver, EI
Project Consultant

Travis W. Adams
Senior Project Manager

PRIMARY SLUDGE

&

DIGESTER EFFLUENT INFORMATION

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.

600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
Associated Process Piping Modifications	1	**LS**	$ 40,000.00	**$/LS**	$ 50.00
Strainpress/Sludge Screen (Huber SP 290)	1	**EA**	$ 140,000.00	**$/EA**	$ 140,000.00
Primary Sludge Pumps Upgrades	1	**LS**	$ 80,000.00	**$/LS**	$ 80,000.00
New Strain Press Installation Cost	1	**LS**	$ 42,000.00	**$/LS**	$ 42,000.00
					$ -
					$ -
Sub-Total					**$ 292,050.00**

SUBTOTAL	**$**	**292,050.00**
Contingency (10%)	$	29,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**321,050.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**96,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**417,050.00**
SAY	**$**	**418,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Assumed Headworks Electrical Cost	$	4,000.00
Replacement and Repair Costs (Pumps, Replacement Part, Etc.)	$	11,050.00
Sub-Total	**$**	**15,050.00**

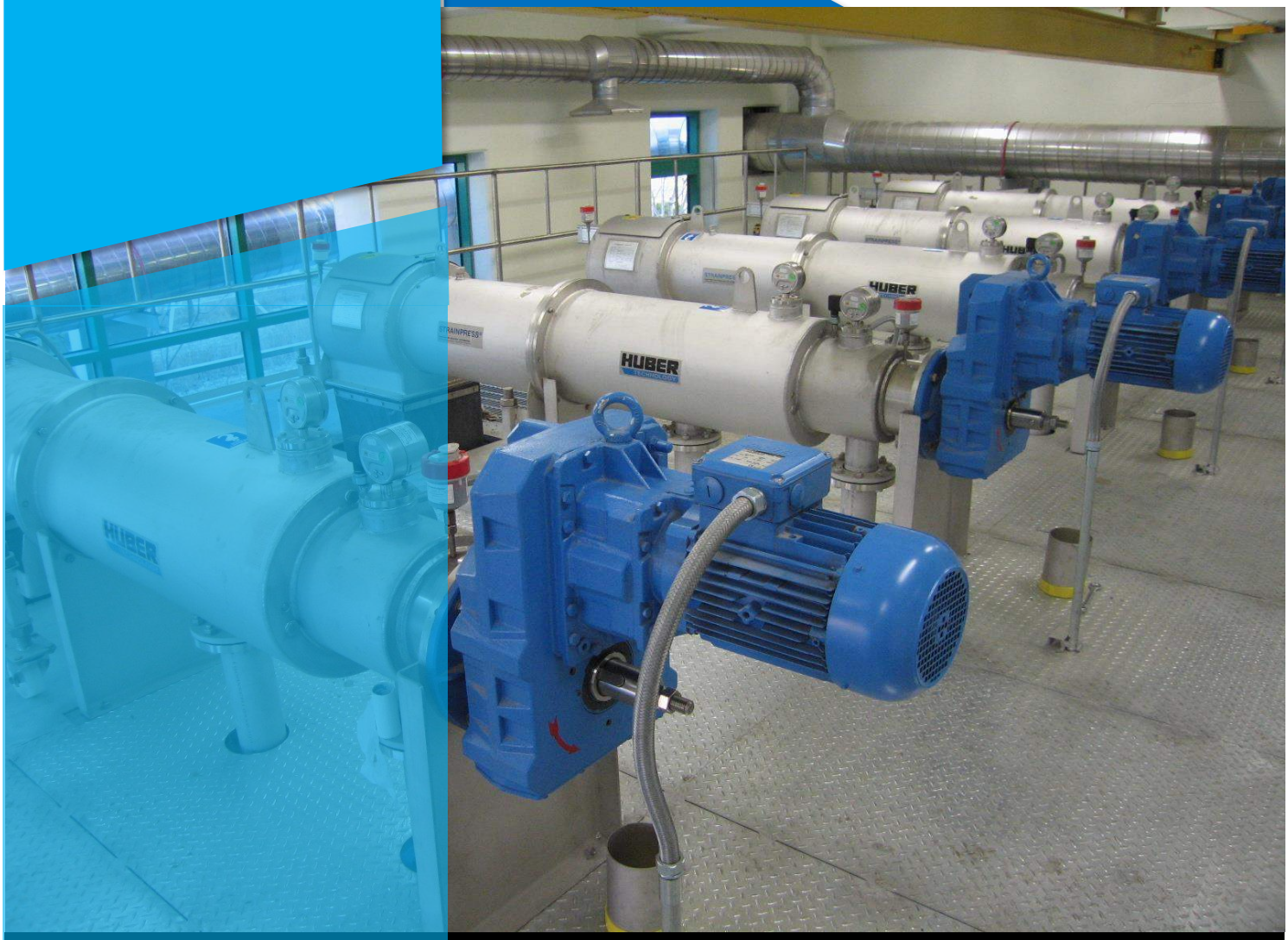
Total Yearly O&M Costs	$	15,050.00
Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	418,000.00
Annual O&M Cost	$	15,050.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718
Equilavlent Annual Operating Cost (EAOC)	$	41,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	418,000.00
Annual O&M Cost	$	15,050.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334
Present Worth of Annual O&M Cost	$	246,089.07
Net Present Value	$	664,089.07

NPV = Total Capital Cost + Present Worth of Annual O&M

HUBER TECHNOLOGY
WASTE WATER Solutions



Budgetary Proposal

Huber Technology, Inc.
9735 Northcross Center Court
Suite A
Huntersville, NC 28078
Office 704-949-1010
Fax 704-949-1020

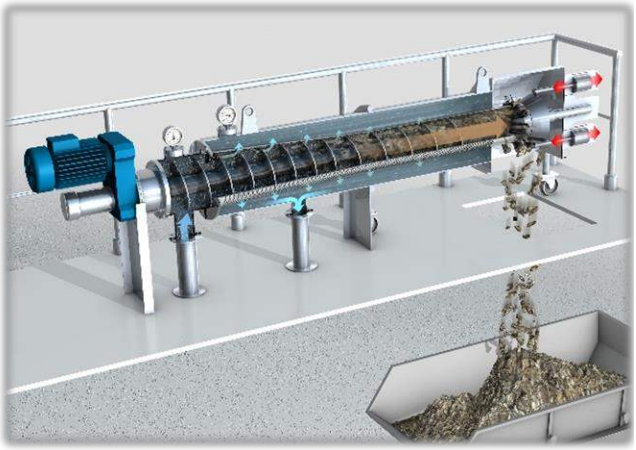
Project: Mt. Vernon, WV
Equipment: Strainpress SP 290
Proposal Date: May 11, 2020
Revision: 0

Scope of Supply

Strainpress Design Information

Strainpress Technical Data

	Waste Activated Sludge	
Sludge Type		
Design Feed Rate	120	*gpm*
Inlet Sludge Concentration	2.0	*% TS*
Design Hydraulic Loading (per unit)	120	*gpm*
Maximum Hydraulic Loading (per unit)	375 at 2%	*gpm*
Alternate Hydraulic Loading (per unit)	375 at 2%	*gpm*
Typical Inlet Pressure	17.0	*psi*
Headloss @ Design Flow Rate	6.0	*psi*
Estimated Screenings Dryness	35-45	*% DS*
Maximum Screenings Removal Rate	35	*ft³/hr*
Maximum Air Requirement	102	*psi*
ANSI Sludge Inlet Diameter	4	*inch*
ANSI Screened Sludge Outlet Diameter	4	*inch*
ANSI Dewatering Zone Outlet Diameter	--	*lbs*
Approximate Empty Weight	1,520	*lbs*
Approximate Loaded Weight	2,420	*lbs*



Strainpress Details

Model	***Strainpress SP 290***
Quantity	1
Frame Material	304L stainless steel construction; picked and passivated in acid bath
Screen Size	Conical screening basket, 5mm perforation
Auger	304L SS stellite tipped screening zone screw for wear protection
Pressure Sensor	IFM pressure sensor
Moisture Sensor	Baumer moisture sensor
Motor Data	5.0 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15
Supports	304L stainless steel
Anchor Bolts	M12, 316L
Control Panel(s)	NEMA 4X stainless steel enclosure, Allen Bradley MicroLogix PLC
	Allen Bradley PanelView 800, 4-inch color OIT
	Preprogrammed and factory tested
	Pneumatic control panel for pneumatic end cone

Pricing

EQUIPMENT	MODEL	QUANTITY	PRICE
Strainpress	SP 290	1	Included
Standard Manufacturer's Services & Freight		3 days, 1 trip	Included
TOTAL:			**$140,000.00**

Thank you for your interest in Huber Technology, Inc.'s Strainpress Sludge Screening unit. If you have any questions, please do not hesitate to contact our Regional Sales Director or our local sales representative.

Huber Sales

Name: Brian Baker
Title: Regional Sales Director - Northeast
Phone: 704-840-3085
Email: Brian.Baker@hhusa.net

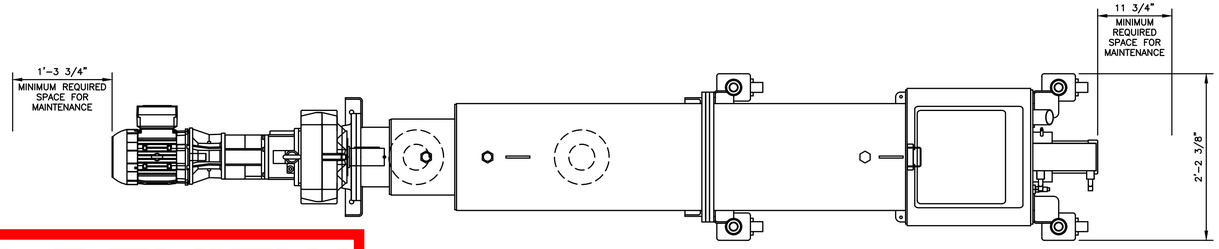
Representative

Firm: Nichols Environmental
Name: Ed Nichols
Phone: (412) 420-9144
Email: ed.nichols@nicholsenv.com

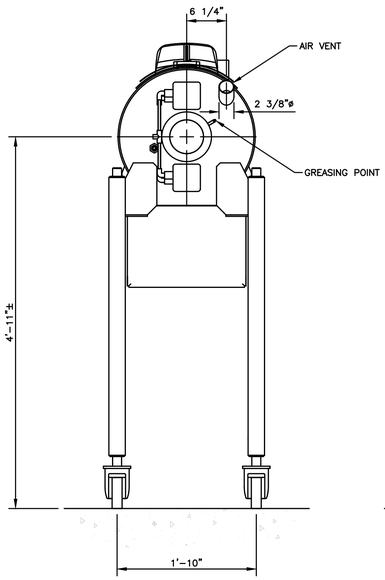
Technical Clarifications

1. Equipment specification is available upon request.
2. If there are site-specific hydraulic constraints that must be applied, please consult the manufacturer's representative to ensure compatibility with the proposed system.
3. Electrical disconnects required per local NEC code are not included in this proposal.
4. Huber Technology warrants all components of the system against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment whichever occurs first.
5. Budget estimate is based on Huber Technology's standard equipment and is quoted in US$ unless otherwise stated.
6. Huber has estimated the Control Panel cost based Huber's standard control panel configuration. Huber reserves the right to change the scope, price, and delivery times at time of bid based on the final plans and specifications.
7. Standard units are available for 8-10 week delivery.

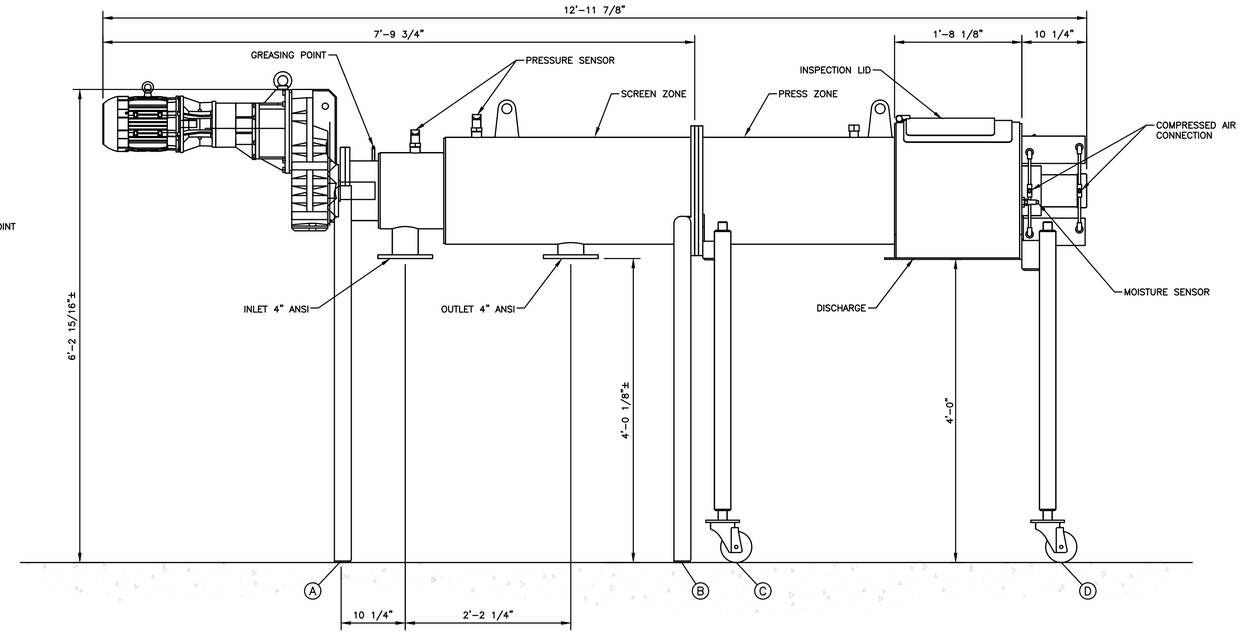
DRAFT - FOR REVIEW ONLY



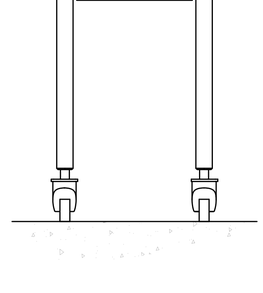
PLAN VIEW
NOT TO SCALE



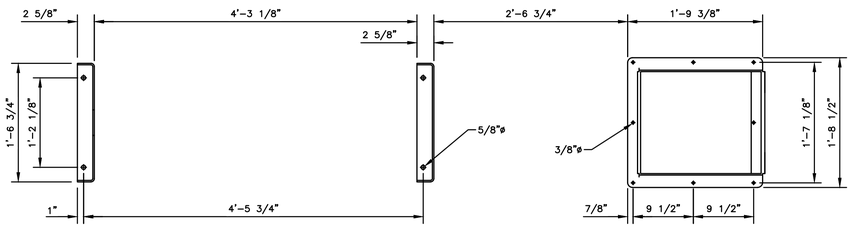
LEFT SIDE ELEVATION
NOT TO SCALE



REAR ELEVATION
NOT TO SCALE



RIGHT SIDE ELEVATION
NOT TO SCALE



BOTTOM MOUNTING VIEW
NOT TO SCALE

EMPTY WEIGHT: 1518 LBS.
WEIGHT WITH FILLING: 2420 LBS.

LOAD DISTRIBUTION AT POINT:

A	B	C	D
≈ 35%	≈ 20%	≈ 20%	≈ 25%

INLET/OUTLET FLANGE DRILLED ACCORDING TO DIN AND ANSI (4")

HUBER SLUDGE CLEANER
(STRAINPRESS 290)
NOT TO SCALE

EQUIPMENT MANUFACTURER:
HUBER TECHNOLOGY
WASTE WATER Solutions
9735-A Northcross Center Ct, Huntersville, NC

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

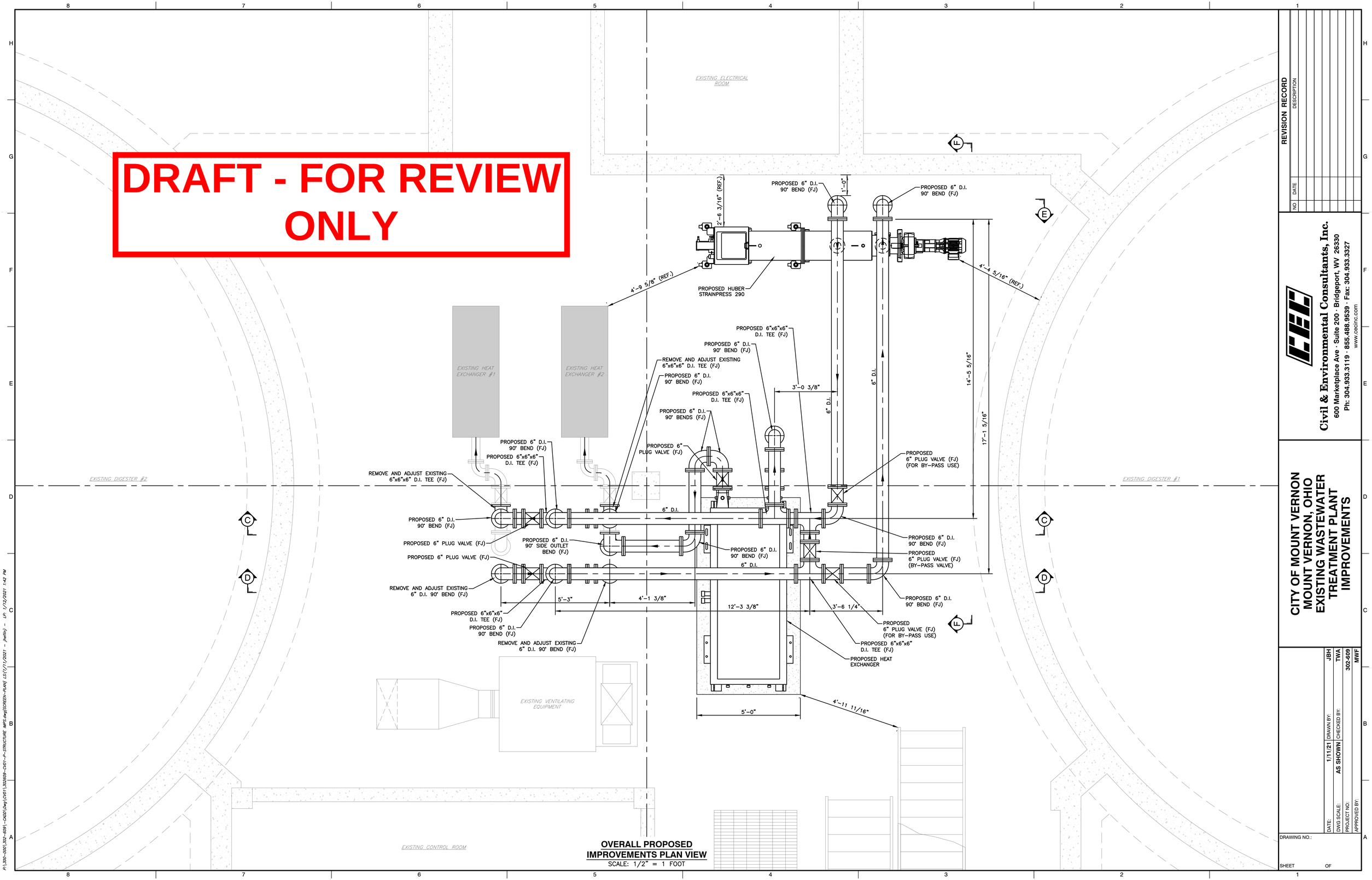
CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DRAWN BY:	JBH
DATE:	1/11/21
CHECKED BY:	TWA
DWG SCALE:	AS SHOWN
PROJECT NO.:	302-609
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF

DRAFT - FOR REVIEW ONLY



OVERALL PROPOSED IMPROVEMENTS PLAN VIEW
SCALE: 1/2" = 1 FOOT

REVISION RECORD

NO	DATE	DESCRIPTION

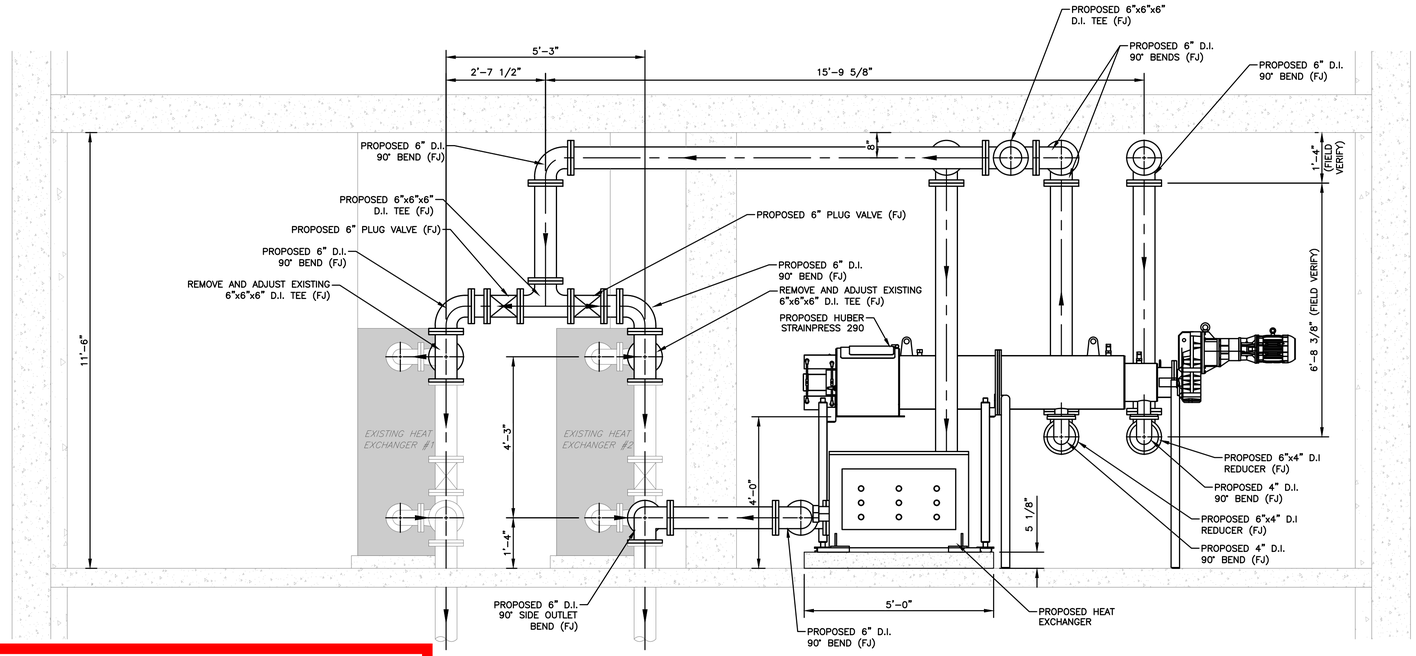
Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

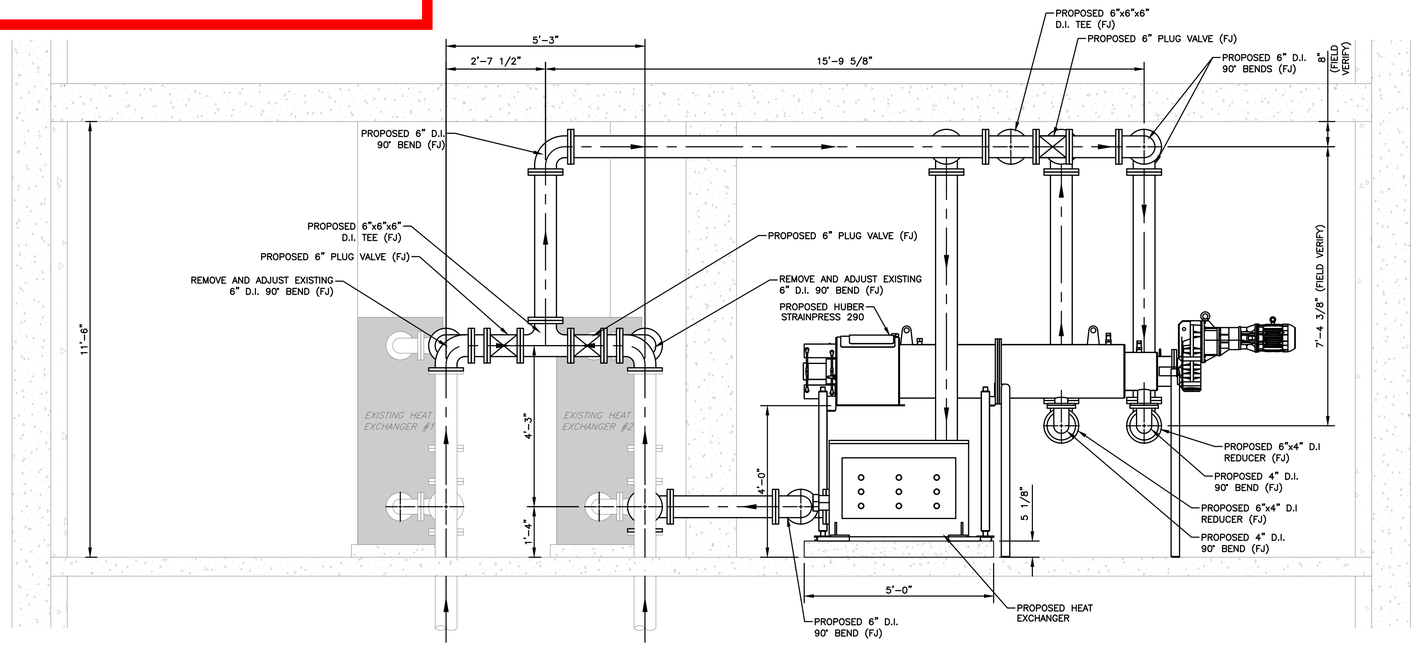
DATE:	1/11/21
DWG SCALE:	AS SHOWN
PROJECT NO:	302-609
DRAWN BY:	JBH
CHECKED BY:	TWA
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF



PROPOSED IMPROVEMENTS
SECTION C-C
SCALE: 1/2" = 1 FOOT



PROPOSED IMPROVEMENTS
SECTION D-D
SCALE: 1/2" = 1 FOOT

DRAFT - FOR REVIEW ONLY

REVISION RECORD

NO	DATE	DESCRIPTION

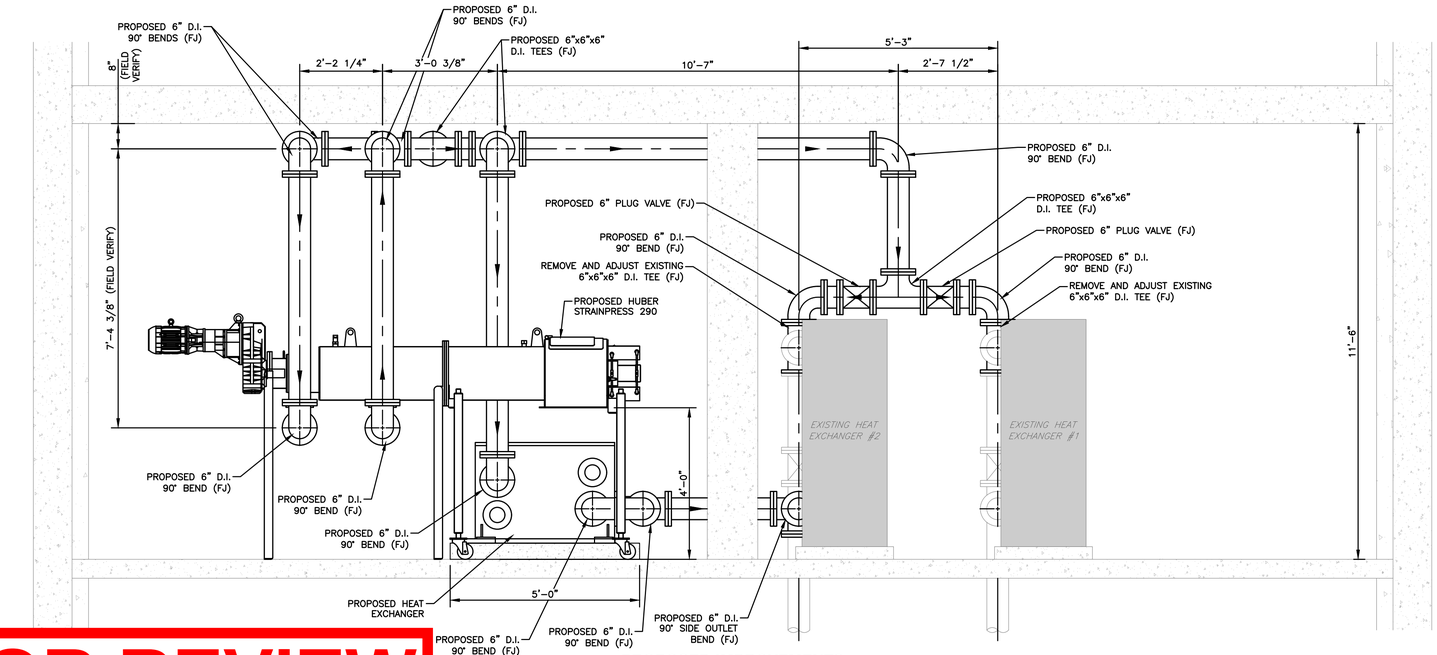
Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT
IMPROVEMENTS

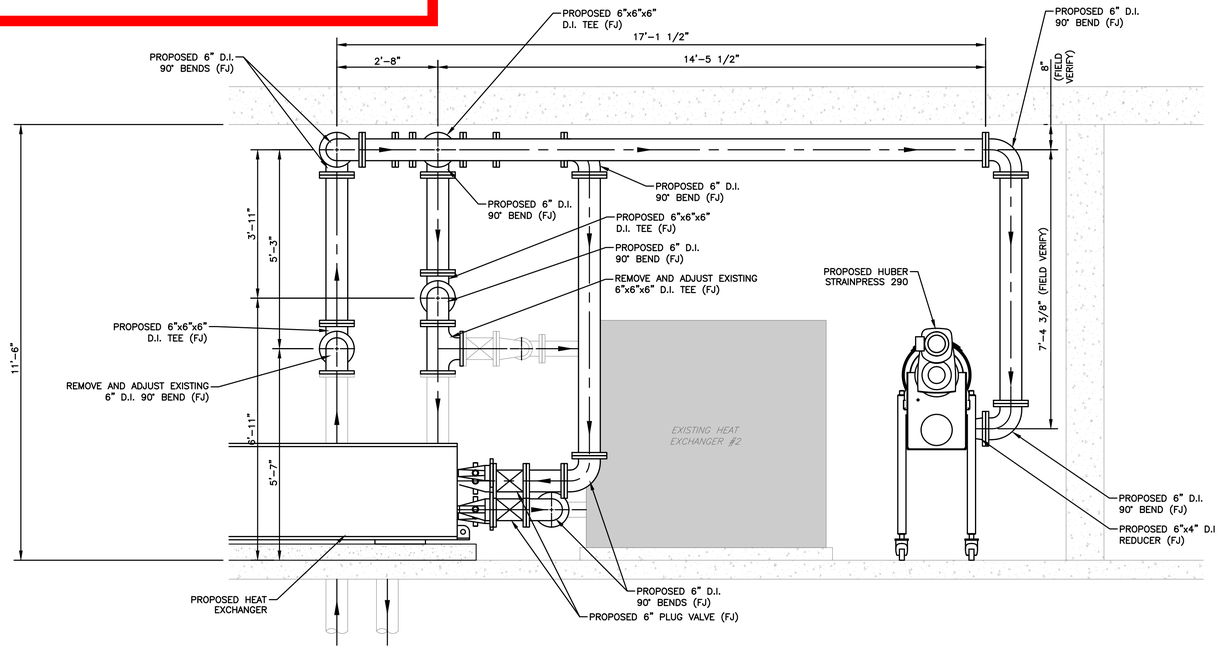
DATE:	1/11/21
DRAWN BY:	JBH
CHECKED BY:	TWA
DWG SCALE:	AS SHOWN
PROJECT NO:	302-609
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF



PROPOSED IMPROVEMENTS
SECTION E-E
SCALE: 1/2" = 1 FOOT



PROPOSED IMPROVEMENTS
SECTION F-F
SCALE: 1/2" = 1 FOOT

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT
IMPROVEMENTS

DATE:	1/11/21	JBH
DWG SCALE:	AS SHOWN	DRAWN BY: TWA
PROJECT NO:	302-609	CHECKED BY:
APPROVED BY:	MWF	

DRAWING NO.:

SHEET OF

ROOFING SYSTEMS MODIFICATION

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.

600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Anaerobic Digester New Steel Floating Covers					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New Vertical Guided Steel Digester Cover (Ovivo 40 G1VF), Complete	2	**EA**	$ 162,000.00	**$/EA**	$ 324,000.00
New Digester Cover Installation Cost	2	**EA**	$ 48,750.00	**$/EA**	$ 97,500.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Removal and Disposal of Existing Digester Covers	2	**EA**	$ 15,000.00	**$/EA**	$ 30,000.00
Sub-Total					**$ 501,500.00**

SUBTOTAL	**$**	**501,500.00**
Contingency (10%)	$	50,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**551,500.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**165,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**716,500.00**
SAY	**$**	**717,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Roofing System O&M	$	22,000.00
Sub-Total	**$**	**22,000.00**

Total Yearly O&M Costs	$	22,000.00
Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	717,000.00
Annual O&M Cost	$	22,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718
Equilavlent Annual Operating Cost (EAOC)	$	66,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	717,000.00
Annual O&M Cost	$	22,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334
Present Worth of Annual O&M Cost	$	359,731.53
Net Present Value	$	1,076,731.53

NPV = Total Capital Cost + Present Worth of Annual O&M

OVIVO Worldwide Experts in Water Treatment

BUDGETARY PROPOSAL

MAY 11, 2020

MOUNT VERNON WWTP

MOUNT VERNON, OH

Ovivo® Steel Covers & Sludge Mixing Systems

PREPARED FOR

MOUNT VERNON WWTP, OH

AREA REPRESENTATIVE

Nichols Environmental
Ed Nichols
Ed.Nichols@nicholsenv.com

PREPARED BY

Nimesh Patel
c/o Bryen Woo
Phone: (801) 931-3000
Bryen.Woo@ovivowater.com

Ovivo USA, LLC
4246 Riverboat Road – Suite 300
Salt Lake City, Utah 84123-2583
http://www.ovivowater.com

COST SUMMARY[1]

ITEM 1 Two (2) Ovivo® Vertical Guided Steel Covers (40 G1VF)	**$324,000**
ITEM 2 Two (2) Steel Cover Observations	**$19,000**
ITEM 3 Two (2) LM™ Linear Motion Mixers (LM12/7.5/72)	**$380,000**
ITEM 4 Two (2) Eimix® Roof Mounted Draft Tube Mixers RDT-T/7.5/24)	**$245,000**
ITEM 5 Four (4) Eimix® External Mounted Draft Tube Mixers (EDT-T/5/24)	**$490,000**

[1] *All prices in US Dollars.*

Note: The mixers quantity and size are based on the design parameter listed below any modification could change the preliminary estimates and design.

DESIGN PARAMETERS

Number of Digester	Two (2)
Cover Type	Floating-Steel
Tank Diameter	40.00 ft
Top of Tank Elevation	1001.67 ft
Maximum Liquid Level Elevation	999.67 ft
Minimum Liquid Level Elevation*	992.67 ft
Corbel Elevation	991.67 ft
Bottom of Wall Elevation	974.00 ft
Bottom of Cone Elevation	970.00 ft
Tank Height	27.67 ft
Cone Height	4.00 ft
Volume Approx.	254,000 gal
Concentration	2-6%
Design Pressure*	16 in w.c
Operating Pressure*	10 in w.c
Live Load*	50 psf
Wind Load*	20 psf

** Assumed Parameters. Please confirm.*

PRODUCT HIGHLIGHTS

Ovivo provides a variety of digester steel covers. Each digester cover is constructed as a dome-shaped segment of a sphere, offering maximum strength and structural integrity.

The digester steel covers are radial beam designed to be erected quickly and efficiently, this is a simple, rigged structural design. The thrust ring is installed at the periphery of each cover to absorb all design loads without transmitting excessive forces to the concrete digester wall. During erection, the cover is supported by radial beams attached to a center ring and the thrust ring which add strength to the complete unit.

OVIVO® GASHOLDER STEEL COVER

Ovivo's radial beam design uses an added side sheet and ballast for digester gas storage. Submerged ballast blocks are used to maximize cover stability and maintain adequate gas pressure. The vertical guides are attached to the tank wall. Guide devices, spanning from the top to the bottom of the cover side-sheet, are engaged to stabilize the cover and protect the cover from substantial wind loads.

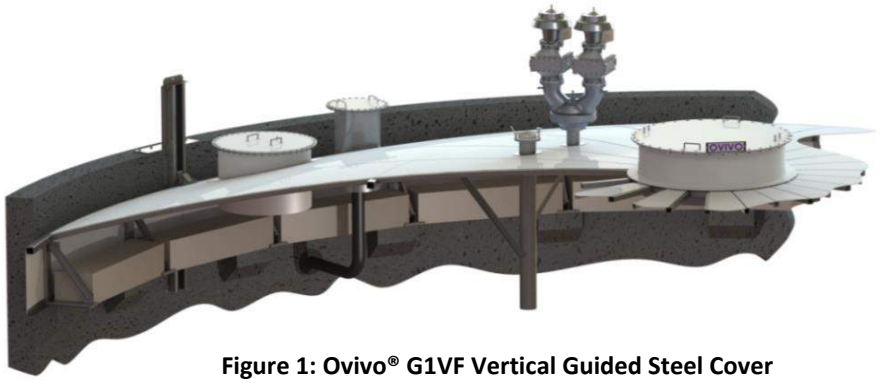


Figure 1: Ovivo® G1VF Vertical Guided Steel Cover

TECHNICAL DATA

For this application and based on the design parameters, Ovivo recommends one (1) Ovivo® 40 G1VF Vertical Guided Steel Covers to be installed on each digester.

Model	**40 G1VF**
Size	40'Ø
Max Side Sheet Length	48 in
Gas Storage[1]	500 ft^3
Total Weight [2]	30,900 lbs
Estimated Field Welding[2]	1,000 ln ft
Estimated Field Painting (Inside and Outside)[2]	3,800 sq. ft

[1] The gas storage capacity is based on the operating pressure and the side sheet length. Any modification to the skirt length will change the estimate cost and gas capacity.

[2] The weights and loads are estimates only, these values will be updated with final values after approved submittals.

Ovivo's scope of supply does not include installation. We provide the estimate weight, welding and painting requirements only. The final values will be provided after approved submittals. The above field welding estimate was based on the overall welding requirements on Figure 2.

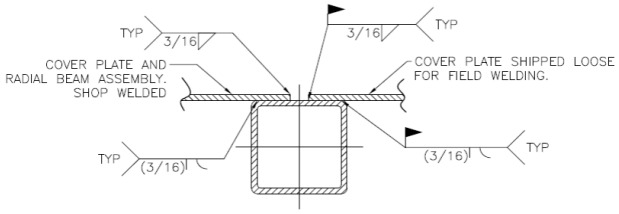


Figure 2: Typical Weld Detail for Radial Beam Connections

BUDGET INFORMATION[1]

Model	**40 G1VF**
Quantity	Two (2)
Scope of Supply	Table No. 1
Total Price	**$324,000**

[1] *All prices in US Dollars.*

ADDITIONAL INFORMATION

FIELD SERVICE:

Ovivo's scope includes the service of a qualified service engineer for the following:

One (1) trip of two (2) days total of service, per digester, for the supervision of equipment start-up, testing supervision, and instructing the operators

Additional service days can be purchased at the current rate.

ESTIMATED LEAD TIMES:

Submittals: Eight (8) weeks after Purchaser's receipt of Ovivo's written acknowledgement of an approved purchase order.
Shipping: Twenty-four (24) weeks after receipt of approved drawings from Purchaser.

TESTING:

After field erection is complete, the Contractor shall test the covers for gas tight construction by filling the tank with water and trapping air under the cover plates. All welded seams and appurtenances shall be checked for leaks by means of a soap suds solution.
The air pressure underneath the dome during the test shall be not less than 14" W.C.

FINISHES:

Steel plates, structural shapes and fabricated assemblies shall be shipped unpainted, for field painting by others. After erection, welding, testing and final inspection of erection by manufacturer's representative, the covers shall be painted (not by Ovivo).

GENERAL:

The design of the digester steel cover does not fall under any specific code or standard for the design analysis. The current codes and standards are be used as guide lines for the design and analysis of the equipment. The analysis will result with a conservative approach that meets the intent of the present codes and standards.

EZ-RECT™ SYSTEM:

The EZ-RECT™ cover erection system is a feature with the digester cover. Ovivo will provide the digester cover with cover plate/radial beam sections pre-assembled and finish welded in the shop to facilitate the erection of the cover. Each assembly will consist of two (2) beams and one (1) cover plate.

Ovivo offers this option to reduce the amount of field welding required to erect a cover of this diameter. **This will reduce the total amount of field welding for the digester steel cover.** Furthermore, this will reduce the number of pieces to be handled during erection.

Ovivo suggests a careful consideration of the various offerings in regards to the amount of field welding disclosed by the cover manufacturers. The variance in the various estimates should be within a reasonable amount of the quantity expressed in this proposal. Ultimately, the Contractor is required to make their own estimate of welding requirements.

Painting: The cover side sheets are shipped unpainted, so all necessary cleaning, sandblasting and painting must be done progressively as the assembly proceeds. Be aware that the side sheets will be difficult to paint if they are installed inside the tank. Do not paint within 3 inches of all areas to be welded. It is also imperative that all welds are per the erection drawings and gas tight. Therefore, the erector must be able to certify that no leaks exist prior to painting.

Cover erection is completed in five steps:

1- Side Sheet Assembly
2- Center Ring and Erection Beam Installation
3- EZ-Rect Cover Plate Assembly Installation
4- Remaining Cover Plate Installation
5- Manholes, Spools, Tubes, Etc., Installation

COVER OBSERVATION

Ovivo offers the site visit to observe the existing two (2) 40 ft covers and the observations' report by a qualified service engineer.

SCOPE OF SUPPLY

Items Included
Cover Observation, including: - Measurement of members - One (1) trip and two (2) days
Report of visit and observations: - Recommendations for any necessary repair work
Service as noted in the "Field Service" and "Additional Field Service" segments
Items Not Included (But Not Limited to The Following)
Preparation of site for site visit and cover inspection: - Access equipment into the digester for the inspection of the cover. Scaffolding where required. - Any safety equipment required for safe entry into the digester, including and not limited to gas and air monitoring equipment. - Ventilation if required. - Cleaned out digester.
Tank or concrete inspection
Coatings inspection (a visual only inspection will be performed. Should an inspection be required, it is recommended to bring in a NACE certified inspector).
Weld inspection (a visual only inspection will be performed. Should an inspection be required, it is recommended to bring in a CWI certified inspector).
Operation and Maintenance manuals
Equipment or accessories other than those listed above
Drawings showing required cover modifications and weld requirements (if applicable)
Cover modifications. Ovivo will provide recommendations only. All material and labor to provide the modification is to be provided by others
Any items not specifically listed in the "Items Included" table

General

Ovivo does not take responsibility for the cover removal method and will not be responsible for any costs associated with damage resulting from improper removal or securing methods. Ovivo's observation does not include any type of concrete inspection.

PRODUCT HIGHLIGHTS

LM™ MIXERS

LM™ (Linear Motion) Mixers offer solutions to the challenges of mixing wastewater in both thin sludge and thick sludge applications, providing homogeneous mixing by creating a turbulent liquid-core of micro and macro eddy currents. These currents are accelerated rapidly through the central opening of an oscillating ring-shaped hydro-disk, which moves up and down through the mix, creating the distinctive linear motion mixing action of the LM™ Mixer.

The frequency, stroke and size of the hydro-disk control the force and velocity of the liquid-core. The LM™ Mixer's oscillating motion produces a flow pattern that approaches nearly isotropic (uniform) mixing. Additionally, LM™ Mixers use pulsating pressure waves in conjunction with the oscillating velocity. In this type of concurrent action the oscillating pressure wave and velocity are coupled together to enhance mass transfer and produce a uniform mixture of the tank's contents.

Figure 3: LM™ Mixer

TECHNICAL DATA

For this application and based on the design parameters, Ovivo recommends One (1) LM™ Mixer per digester as follows:

Model	**LM12/7.5/72**
Motor Size	7.5 hp
Estimated Dead Weight	4,900 lbs
Estimated Max. Dynamic Load	2,700 lbs
Number of Mixers per Tank	One (1)

ENERGY CONSUMPTION COMPARISON

LM™ Mixer vs. Conventional Mixing System

Motor Size	Years			
(hp)	1	5	10	20
7.5	$3,307	$19,169	$44,443	$119,456
20	$8,819	$51,116	$118,515	$318,549
Difference	**$5,512**	**$31,948**	**$74,072**	**$199,093**

The operation cost estimated is based on 0.09 $/kW-h, running the mixer at 75% of the total motor horsepower continuously.

BUDGET INFORMATION[1]

Model	**LM12/7.5/72**
Total Quantity	Two (2)
Scope of Supply	Table No. 2
Estimated Yearly Energy Cost[23]	$3,300
Price[4]	**$380,000**

[1] *All prices in US Dollars.*
[2] *Estimated per Digester.*
[3] *The energy cost estimate based on 0.09 $/kW-hr, running the mixer at 75% of the horse power continuously.*

ADDITIONAL INFORMATION

SURFACE PREPARATION AND PAINTING

Ovivo will ship all fabricated steel painted as listed below:

Submerged Surface	
Surface Preparation:	SSPC-SP-10, near-white blast cleaning
Prime Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Finish Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Non-Submerged Surface	
Surface Preparation:	SSPC-SP-10, near-white blast cleaning
Prime Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Intermediate Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Finish Coat:	Tnemec Series 73 or equal @ 3-5 mils DFT.

Stainless steel components will not be painted. The Field touchup is not included.

FIELD SERVICE:

Ovivo's scope includes the service of a qualified service engineer for the following:

One (1) trip of two (2) days total of service, per digester at the site for the supervision of equipment start-up, testing supervision, and instructing the operators.

Additional service days can be purchased at the current rate.

ESTIMATED LEAD TIMES:

Submittals: Eight (8) weeks after Purchaser's receipt of Ovivo's written acknowledgement of an approved purchase order.
Shipping: Twenty four (24) weeks after receipt of approved drawings from Purchaser.

WATEREXPERT™ SYSTEM:

Ovivo offers a mobile-based platform (Water Expert) allowing to reserve workforce's expertise by uploading media and procedures, access itemized OEM operator manuals for all of your Ovivo Installations, create and update service logs, maintenance schedules, performance alerts.

The Water Expert platform is unique in the industry and allows the end user to any new content in addition to getting instant access to expert support and monitor equipment performance with live data readings with any cellphone, tablet or PC. See the link below for additional information:

https://www.youtube.com/watch?v=qWvU6fjlypY&feature=youtu.be

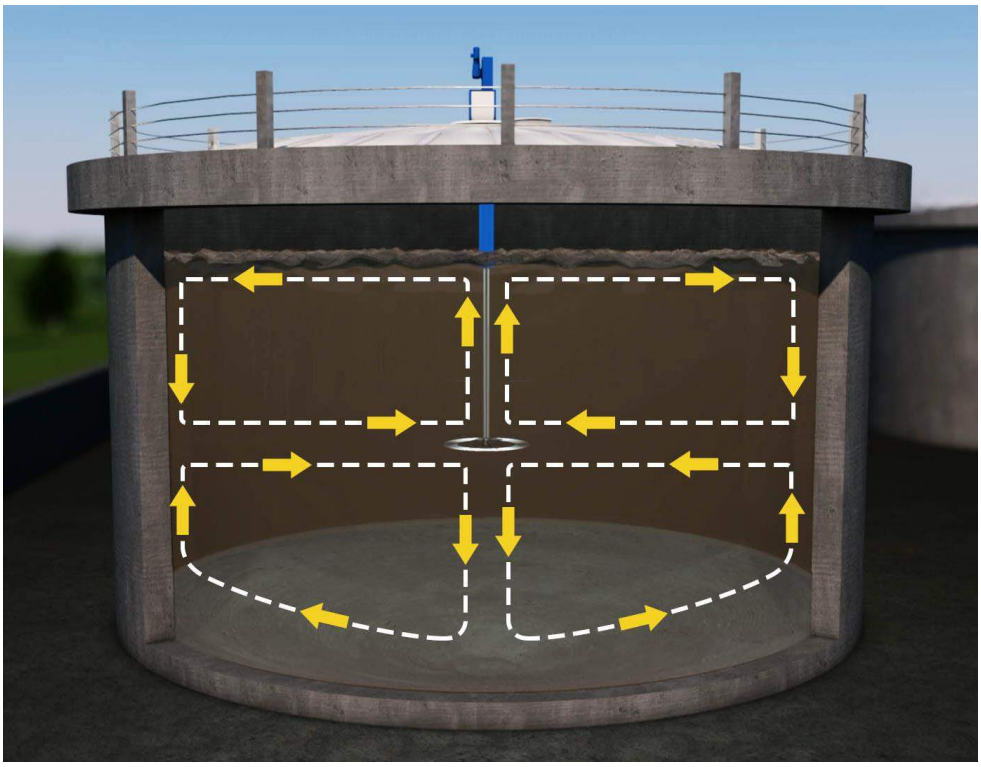


Figure 4: LM™ Mixer (showing flow pattern inside Digester)
(Click Link to Watch Video)

PRODUCT HIGHLIGHTS

EIMIX® DRAFT TUBE SLUDGE MIXERS

The Eimix® Mechanical Sludge Mixers create a tangential, spiralling flow pattern within the tank. The Eimix® propeller is symmetrical about both axes and can pump sludge with equivalent capacity in both directions. The reversible direction of flow (up or down) allows the adjustments in the mixing dynamics of the digester.

The performance of the Eimix® Mechanical Sludge Mixers varies between 0.20 to 0.30 hp/1,000 ft^3 per ASCE/WEF Design of Municipal Wastewater Treatment Plants, Manual of Practice (MOP 8) Recommendations and Design Parameters to achieve 30 to 45 minute turnover time.

Figure 5: Eimix® External Mounted Tube Mixer

Figure 6: Eimix® Roof Mounted Tube Mixer

TECHNICAL DATA

For this application and based on the design parameters, Ovivo recommends following options:

- One (1) Eimix® RDT (Roof Mounted) Per Digester. **(RDT-T-7.5-24)**
- Two (2) Eimix® EDT (External Draft Tube) Per Digester. **(EDT-T-5-24)**

Model	RDT-T/7.5/24	EDT-T/5/24
Motor Size	7.5 hp	5 hp
Turnover Time[1]	28 min	17 min
Power to Volume Ratio[1]	0.22 hp/1,000 ft³	0.29 hp/1,000 ft³
Estimated Dead Weight[2]	6,400 lbs	7,700 lbs
Quantity per Tank	**One (1)**	**Two (2)**

[1]These parameters comply with the recommendations of the ASCE /WEF MOP # 8 1998 Ed. for digester mixing.
[2]Estimate per unit.

BUDGET INFORMATION[1]

Model	RDT-T/7.5/24	EDT-T/5/24
Total Quantity	Two (2)	Four (4)
Scope of Supply	Table No. 3	Table No. 4
Estimated Yearly Energy Cost [23]	**$3,300**	**$2,200**
Total Price	**$245,000**	**$490,000**

[1] All prices in US Dollars.
[2] Estimated energy cost per mixer.
[3]The Operation cost estimate based on 0.09 $/kW-hr, running the mixer at 75% of the horse power continuously.

ADDITIONAL INFORMATION

SURFACE PREPARATION AND PAINTING

Ovivo will ship all fabricated steel painted as listed below:

Submerged Surface	
Surface Preparation:	SSPC-SP-10, near-white blast cleaning
Prime Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Finish Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Non-Submerged Surface	
Surface Preparation:	SSPC-SP-10, near-white blast cleaning
Prime Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Intermediate Coat:	Tnemec Series 66HS or equal @ 4-6 mils DFT.
Finish Coat:	Tnemec Series 73 or equal @ 3-5 mils DFT.

Stainless steel components will not be painted. The Field touchup is not included.

FIELD SERVICE:

Ovivo's scope includes the service of a qualified service engineer for the following:

One (1) trip of two (2) days total of service, per digester at the site for the supervision of equipment start-up, testing supervision, and instructing the operators in maintenance, troubleshooting, and repair of the equipment.

Additional service days can be purchased at the current rate.

ESTIMATED LEAD TIMES:

Submittals: Eight (8) weeks after Purchaser's receipt of Ovivo's written acknowledgement of an approved purchase order.
Shipping: Twenty-four (24) weeks after receipt of approved drawings from Purchaser.

TABLE No. 1
40 G1VF GASHOLDER COVER - SCOPE OF SUPPLY

Items Included
One (1) 79"Ø center ring with cover plate, flange bolts, nuts and gasket
Two (2) 36"Ø manhole(s) with bolts, gaskets and cover flange. Covers provided by others
One (1) 24"Ø Gas bonnet
Two (2) 6"Ø sample tubes. Covers provided by others
Two (2) 4"Ø flanged open nozzle for PRVB assembly. Valves provided by others
Necessary Steel Cover Components such as: - Erection Beams - Cover Plates - Epoxy anchoring assemblies - Side Skirt Sections including ballast support brackets
Four (4) Slide Guides, with chemical type anchors, as follows: - Slide guides mounted to the concrete tank, HDG - Slide guides mounted to the cover, 304 Stainless Steel - UHMW wear strips on three sides
Side skirt with 4 ft long side sheet plates
Mild Steel construction except as noted
EZ Rect™ System
Operation and Maintenance manuals
Service as noted in the "Field Service" segment of this proposal section
FCA Factory, Freight allowed to the jobsite

Items Not Included (But Not Limited To The Following)
Ballast blocks
Gas handling equipment, unless included above
Valves, unless included above
Sample tube covers
Cover position indicators
Sight glasses
Walkways, stairs, steps, ladders, unless included above
Handrails grates, platforms, grating, unless included above
Piping, fittings, tubing and pipe supports
Coating, prime paint, field touch up or finishing painting
Flange bolts, nuts and gaskets
Grout
Insulation or Roofing
Cover sealant, filling material, caulking, oakum or asphalt
Modifications digester tank or other equipment
Installation
Testing, testing materials and / or testing equipment
Conduit, wiring, or any other control or electrical items
Any items not specifically listed in the “Items Included” table

TABLE No. 2
LM12 MIXER - SCOPE OF SUPPLY

Items Included
7.5 hp Explosion proof, 1800 rpm 230/460 V, 3 Ø, 60 Hz
Mounting plate matching mounting port bolt pattern
Seal tube
Fasteners for mounting plate, 304 stainless steel
Hydro-disk, 304L stainless steel
Lower shaft, 304L stainless steel
Drive system including: - Drive mechanism stand, - Drive mechanism enclosure, - Driver mechanism (scotch yoke design), - Driving shaft with seals, - Gearbox and motor (as listed above)
Local control station, NEMA 7: - Hand/Off/Auto - Remote/local operation

Motor Control Panel: - NEMA 4X - Motor starter - Monitoring instrumentation for vibration, temperature and power draw. *Note:* - *The data collection shall be transmittable to the plant SCADA through an Ethernet gateway.* - *Wiring between instrumentation and control panel not included.*
One (1) Year subscription to WaterExpert™ System
Spare Parts per Digester: - Four (4) Mixer Sliding Blocks - Two (2) Mixer Rails - Four (4) Auto Greasers - One (1) CAM Follower Assembly
Mild Steel construction except as noted
Coating as noted in the "Surface Preparation and Painting" segment
Service as noted in the "Field Service" segment
FCA Factory, Freight allowed to the jobsite
Items Not Included (But Not Limited To The Following)
Main control panel
VFD's
Mixer port
Cover modifications/reinforcement
Piping, fittings, tubing and pipe supports
Digester cleaning and temporary dewatering
Wiring, conduit
Finish or field touch-up paint
Handrail, grating, ladder or any other platform item not specifically listed above
Sealant, insulation, lubricants
Unloading, storage, Installation
Any items not specifically listed in the "Items Included" table

TABLE No. 3
RDT MIXER - SCOPE OF SUPPLY

Items Included
24 inch Ø Eimix® propeller, Cast Iron
7.5 hp Explosion proof, 1800 rpm 230/460 V, 3 Ø, 60 Hz
Drive belts and sheaves
FRP belt guard w/ fasteners

Mounting flange
Neoprene mounting gasket
Adjustable centering device
Drive shaft
Shaft housing with flow deflector
Upper / lower drive shaft bearings w/ seals
Upper / lower draft tubes
Local control station, NEMA 7: - On/Off/Auto, - Remote/local operation, - FWD/REV operation
Spare Parts per Digester: - One (1) Set of Mechanical Seal - One (1) Set of upper bearing - One (1) Set of lower bearing - Two (2) Sets of drive belts
Mild Steel construction except as noted
Coating as noted in the "Surface Preparation and Painting" segment
Service as noted in the "Field Service" segment
FCA Factory, Freight allowed to the jobsite
Items Not Included (But Not Limited To The Following)
Main control panel
VFD's or Motor Starters
Mixer port
Cover modifications/ reinforcement
Piping, fittings, tubing and pipe supports
Digester cleaning and temporary dewatering
Wiring / conduit
Finish or field touch-up paint
Flooring walkways, stairs, steps, ladders, etc.
Sealant, insulation, lubricants
Unloading, storage
Installation
Any items not specifically listed in the "Items Included" table

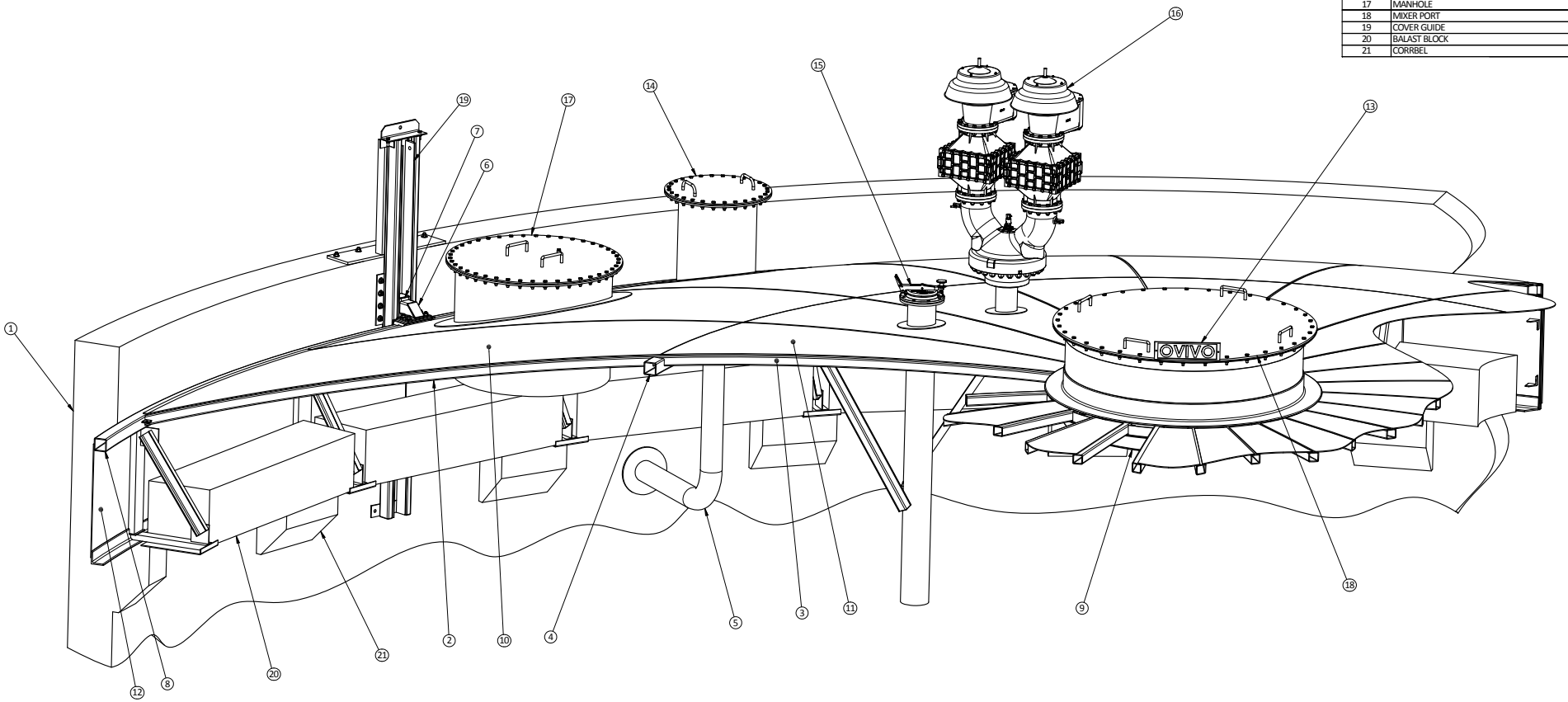
TABLE No. 4
EDT MIXER - SCOPE OF SUPPLY

Items Included
24 inch Ø Eimix® propeller, Cast Iron

5 hp Explosion proof, 1800 rpm, 220/440 V, 3 Ø, 60 Hz
Drive belts and sheaves
FRP belt guard w/ fasteners
Mounting flange
Neoprene mounting gasket
Adjustable centering device
Drive shaft, shaft housing with flow deflector
Upper / lower drive shaft bearings w/ seals
Upper / lower draft tubes with segmented elbow construction
Inlet / discharge wall pieces
Service platform structural members with handrails and gratings
Spare Parts per Digester: - One (1) Set of Mechanical Seal - One (1) Set of upper bearing - One (1) Set of lower bearing - Two (2) Sets of drive belts
Local control station, NEMA 7: - On/Off/Auto, - Remote/local operation, - FWD/REV operation
Mild Steel construction except as noted
Coating as noted in the "Surface Preparation and Painting" segment
Service as noted in the "Field Service" segment
FCA Factory, Freight allowed to the jobsite
Items Not Included (But Not Limited To The Following)
Main control panel
VFD’s or Motor Starters
Digester modifications/ reinforcement
Piping, fittings, tubing and pipe supports
Digester cleaning and temporary dewatering
Wiring / conduit
Finish or field touch-up paint
Flooring walkways, stairs, steps, ladders, etc.
Sealant, insulation, lubricants
Unloading, storage
Installation
Any items not specifically listed in the “Items Included” table

EQUIPMENT LAYOUT

ITEM	DESCRIPTION
1	DIGESTER TANK WALL
2	OUTER ERRECTION BEAM
3	INNER ERRECTION BEAM
4	INTERMEDIATE THRUST RING
5	GAS TAKE-OFF PIPE
6	COVER SUPPORT
7	COVER SLIDE
8	THRUST RING
9	CENTER COMPRESSION RING
10	OUTER COVER PLATE
11	INNER COVER PLATE
12	SIDE SKIRT
13	NAME PLATE
14	GAS BONNET
15	SAMPLE TUBE
16	PRESSURE RELIEF - VACUUM BREAKER
17	MANHOLE
18	MIXER PORT
19	COVER GUIDE
20	BALAST BLOCK
21	CORRBEL



D

THIRD ANGLE PROJECTION

REF. FROM		DO NOT SCALE PRINTS
DATE [month/day/year]	3/13/2014	WORKMANSHIP STANDARD ISO9001 APPLIES
DRAWN	JLQ	ORIGINAL S.O.
CHECK'D	EMH	

OVIVO
Bringing water to life

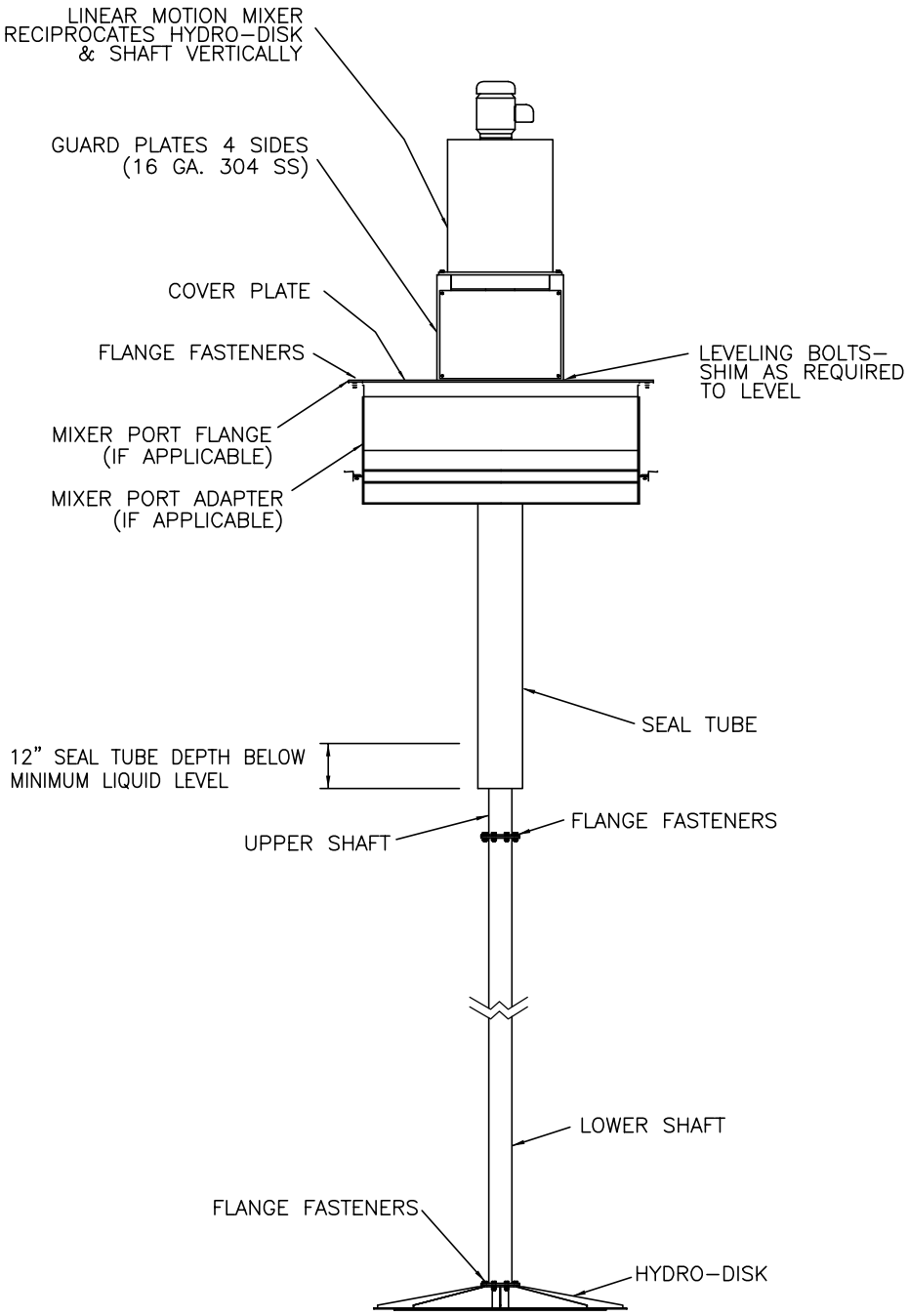
TYPE G1V
FLOATING
DIGESTER COVER

REVISION DESCRIPTION	EN/ECO	BY	CHECK'D	DATE	REV
INITIAL RELEASE					A

DWG. NO. -

SHEET 1 OF 1

REV



REVISION DESCRIPTION	EN/ECO	BY	CHECK'D	DATE	REV
INITIAL RELEASE				11/22/2016	A

A

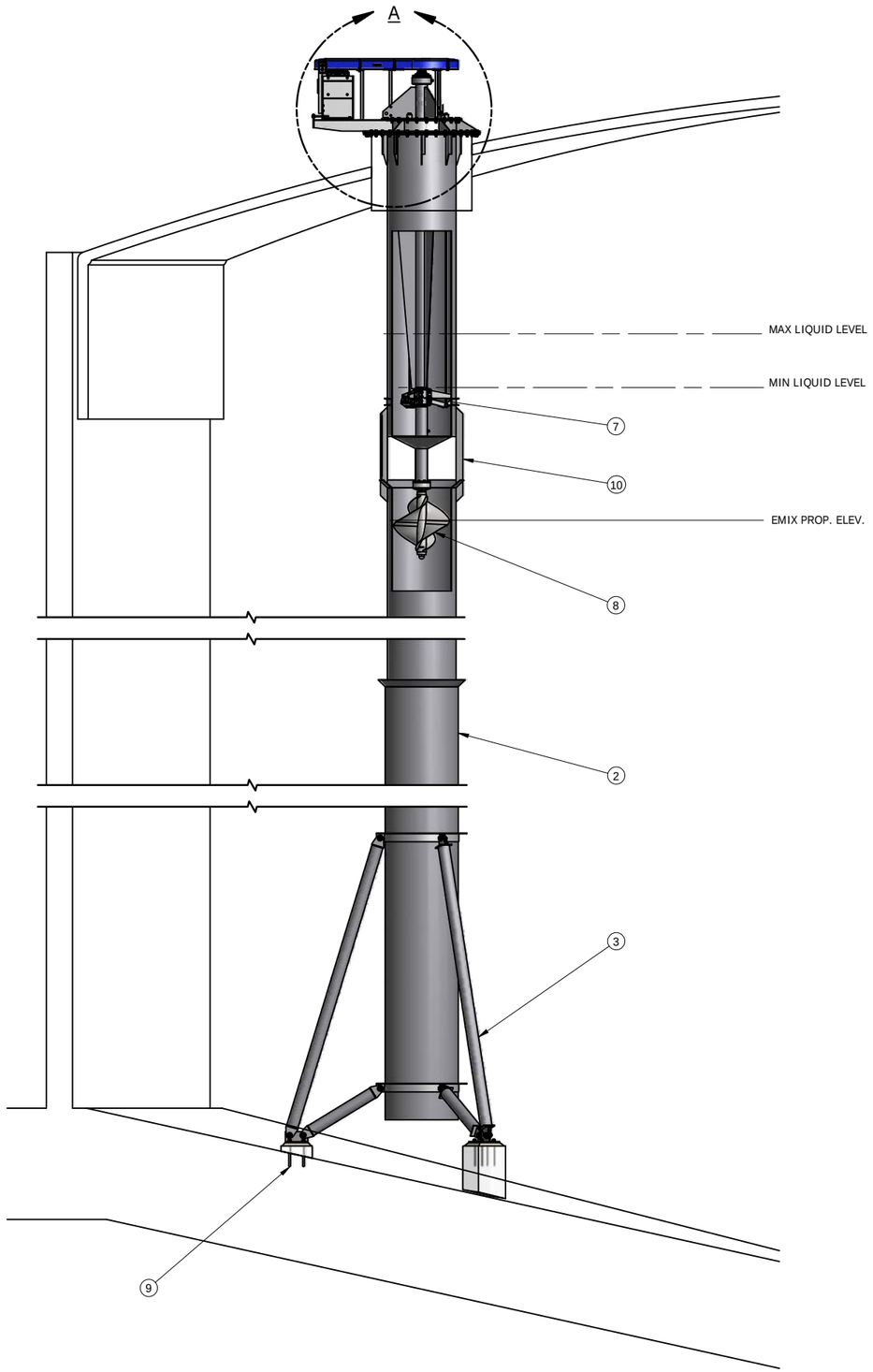
THIRD ANGLE PROJECTION

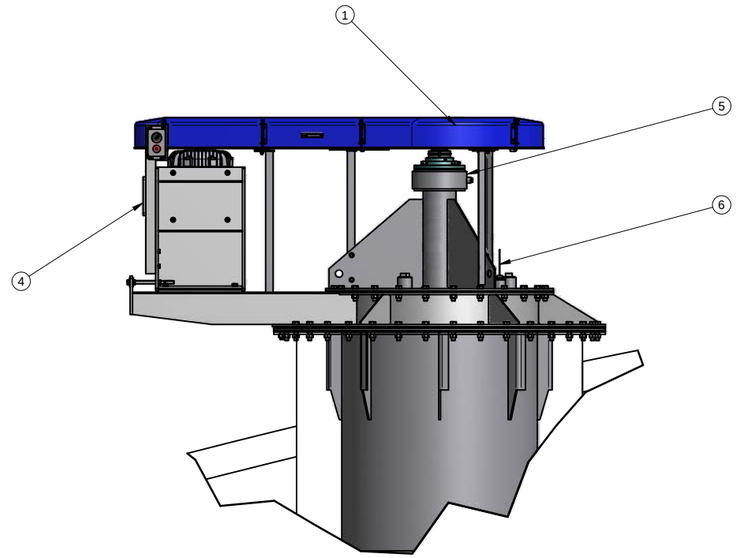
OVIVO
Worldwide Experts in Water Treatment

LINEAR MOTION MIXER
GENERAL ARRANGEMENT

REF. FROM		DO NOT SCALE PRINTS				
DATE (mm/dd/yyyy)	11/22/2016	WORKMANSHIP STANDARD ES0001 APPLIES				
DRAWN	NP	ORIGINAL S.O.	DWG. NO.	LM MIXER	SHEET 1 OF 1	REV A
CHECK'D	JAG	-				

ITEM	DESCRIPTION
1	SLUDGE MIXER ASSEMBLY
2	DRAFT TUBE ASSEMBLY
3	TRI-POD LEG ASSEMBLY
4	REVERSIBLE EXPLOSION PROOF MOTOR
5	UPPER BEARING
6	OIL DIPSTICK
7	CENTERING DEVICE
8	EIMIX RAGLESS PROPELLER
9	ANCHOR ASSEMBLY
10	OUTLET/INLET SUPPORT BAFFLES





DETAIL A

THIRD ANGLE PROJECTION

REF. FROM	-	DO NOT SCALE PRINTS
DATE (mm/dd/yyyy)	7/16/2014	WORKMANSHIP STANDARD ES0001 APPLIES
DRAWN	EMH	ORIGINAL S.O.
CHECK'D	JAG	-

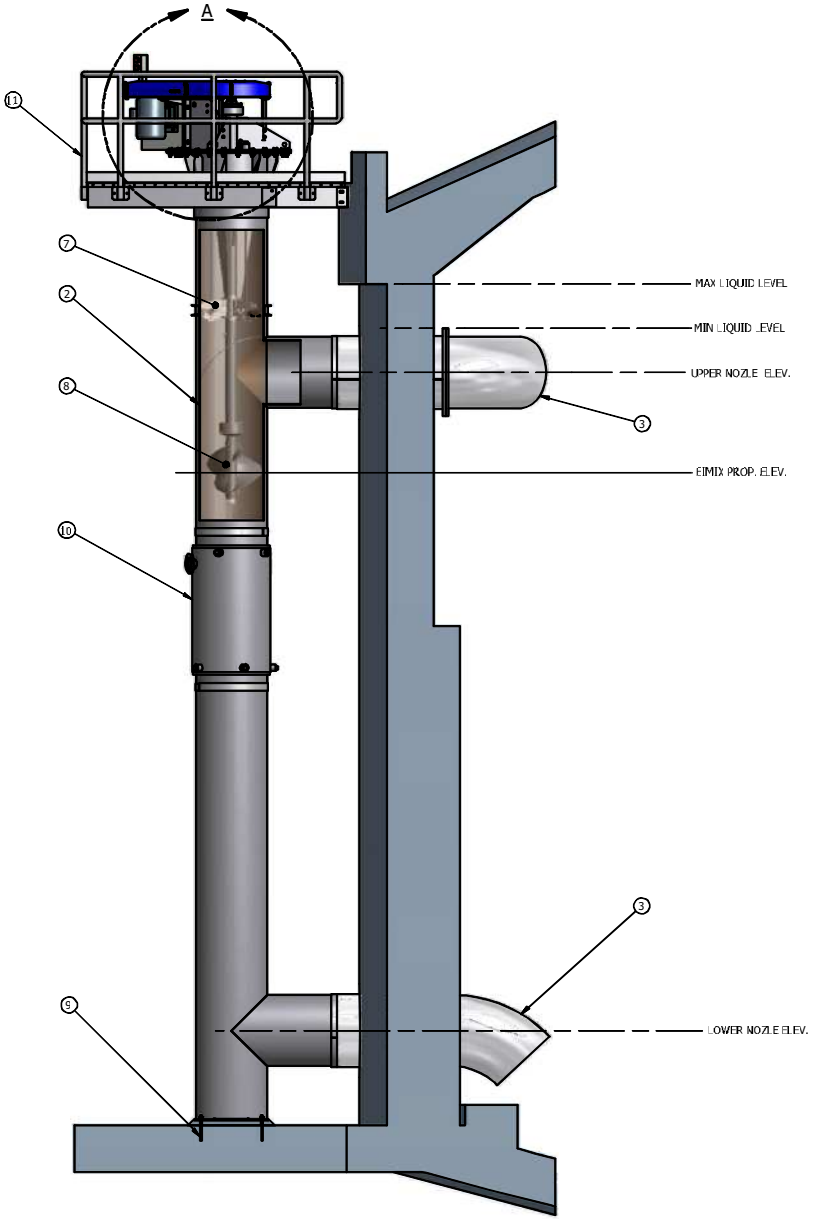
OVIVO
Bringing water to life

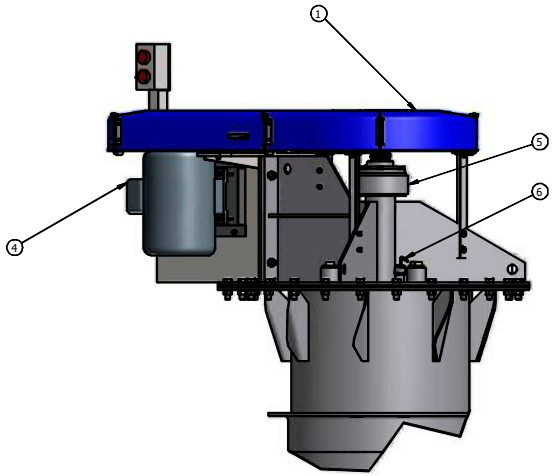
RDT DRAFT TUBE MIXER
EIMIX SLUDGE MIXER

DWG. NO.	-	SHEET 1 OF 1	REV A

REVISION DESCRIPTION	EN/ECO	BY	CHECK'D	DATE	REV
INITIAL RELEASE					A

ITEM	DESCRIPTION
1	SLUDGE MIXER ASSEMBLY
2	DRAFT TUBE ASSEMBLY
3	OUTLET/INLET NOZZLE
4	REVERSIBLE EXP. OSION PROOF MOTOR
5	UPPER BEARING
6	OIL DIPSTICK
7	CENTERING DEVICE
8	EIMIX RAGLESS PROPELLER
9	ANCHOR ASSEMBLY
10	HEAT EXCHANGER (OPTIONAL)
11	PLATFORM (OPTIONAL)





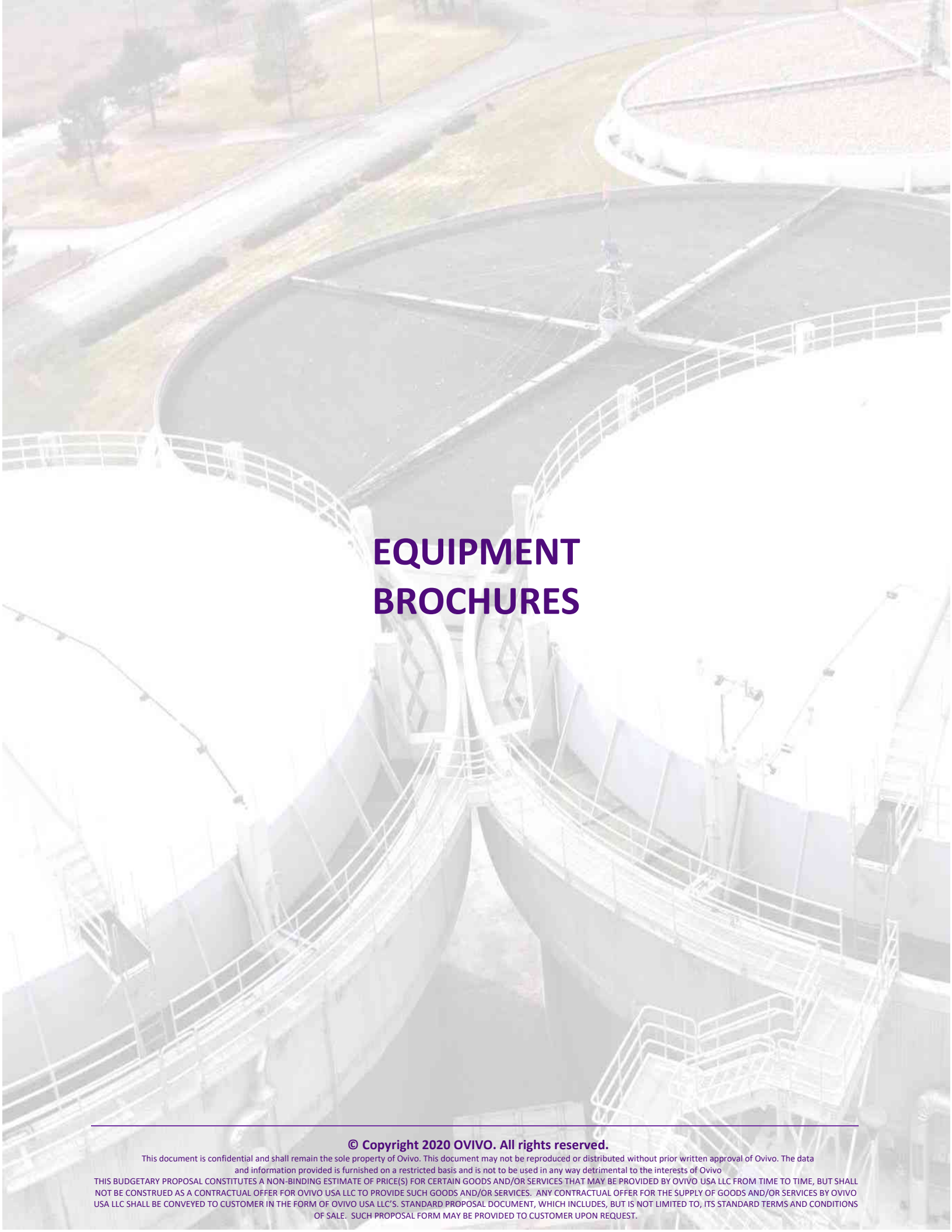
DETAIL A

INITIAL RELEASE					A
REVISION DESCRIPTION	EN/ECO	BY	CHECK'D	DATE	REV

D	THIRD ANGLE PROJECTION	OVIVO Bringing water to life
REF. FROM	-	DO NOT SCALE PRINTS
DATE	7/16/2014	EDT DRAFT TUBE MIXER EIMIX SLUDGE MIXER
DRAWN	EMH	ORIGINAL S.O.
CHECK'D	JAG	-

DWG. NO. -

SHEET 1 OF 1 REV A



EQUIPMENT BROCHURES

OVIVO

MUNICIPAL WATEWATER
ANAEROBIC DIGESTION

COST EFFECTIVE SLUDGE STABILIZATION

- Simple installation operation & maintenance
- Flexible design to suit many applications
- Variable sludge storage capabilities
- No moving parts for simplified maintenance
- 30+ year life span

Easy to insulate using commonly available roofing materials. Call us at 1.855.GO.OVIVO to learn more!

OVIVO® ANAEROBIC DIGESTER STEEL COVERS

A VARIETY OF STEEL DIGESTER COVERS

Ovivo provides a variety of steel digester covers. Each cover is constructed as a dome-shaped segment of a sphere, offering maximum strength and structural integrity. The steel digester covers are radial beam designed to be erected quickly and efficiently. A thrust ring is installed at the periphery of each cover to absorb all design loads without transmitting excessive forces to the digester wall. During erection, the cover is supported by radial beams attached to a center ring and the thrust ring which add strength to the complete unit.

Our radial beam design includes the following configurations: Fixed, Gasholder, HydroSeal® type and Buoyant steel cover. Ovivo will provide the best option for each application based on the customer needs.

Spanish Fork STP, UT (50' F1) :

Fixed Steel Cover Installation

Salt Lake City WRF, UT (90' G2VL) :

Gasholder Steel Cover Installation

Honouliuli WWTP, HI (90' G2VL):

Gasholder Steel Cover

DC WASA, DC (98.5' F2) :

Fixed Steel Cover

A NUMBER OF BENEFITS

- The use of radial beams allows the cover to be erected quickly and efficiently.
- Ovivo's cover design is compatible with all our available mixing systems to ensure adequate anaerobic digestion process.
- The covers are designed based on the requirements specified for each application, using the latest structural standards.
- A variety of accessories are available with our covers to effectively interface with the consulting engineer's design and comply with the customer requirements.

FIXED STEEL COVER (TYPE F)

The Type F cover is the most economical steel cover. The main application is on digesters with constant water level (primary or first stage digesters). The Fixed covers can be sealed against the tank to combat odors. For this design, the side sheet should be extended below the minimum liquid level. Otherwise, two options are recommended: 1) the supplier of the filler material should confirm that it can withstand the operating pressure 2) an independent clean liquid launder should be provided that allows for a pressure seal at any given sludge level (Contact Ovivo for additional details for this option).

GASHOLDER STEEL COVER (TYPE GV)

The Type GV uses the radial beam design structure with added side sheet and ballast for digester gas storage. Submerged ballast blocks are used to maximize cover stability and maintain adequate gas pressure. The design includes a vertical guide arrangement with guides attached to the tank wall. Guide devices, spanning from the top to the bottom of the cover side sheet, are engaged to stabilize the cover.

HYDROSEAL® STEEL COVER (TYPE GVL)

The separate launder and liquid seal between the digester tank and the cover eliminates gas and VOC emissions, improves service access and improves the maintenance access.

This design allows variable sludge storage capabilities since the side sheet operates independent of sludge storage in clean area. No components come in contact with the sludge.

BUOYANT STEEL COVER (TYPE B)

The Type B uses the radial beam design structure including a peripheral buoyant chamber. The cover floats directly on the digester contents. Precast concrete ballast blocks are placed to maintain a specified gas pressure. A major portion of the buoyant volume which keeps the cover afloat is located at the cover periphery; this feature provides an excellent resistance to tipping. The slide guide system will provide vertical movement without rotation or binding.

EZ-RECT™ SYSTEM

The EZ-RECT™ cover erection system is a feature with the digester cover. Ovivo offers this option to reduce the amount of field welding.

Ovivo will provide the digester cover with cover plate/radial beam sections pre-assembled and finish welding in the shop to facilitate the erection of the cover. Each assembly will consist of two (2) beams and one (1) cover plate.

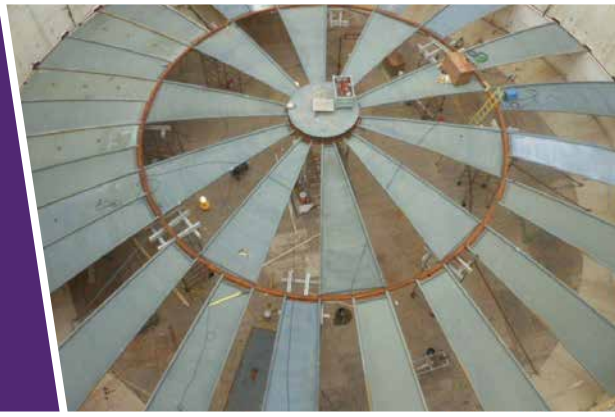
COVER ERECTION IS COMPLETED IN FIVE STEPS:

1. Side Sheet Assembly
2. Center Ring and Erection Beam Installation
3. EZ-Rect Cover Plate Assembly Installation
4. Remaining Cover Plate Installation
5. Manholes, Spools, Tubes, Etc., Installation

ANCILLARY EQUIPMENT

Ovivo can supply all plant required equipment for a complete Sludge Treatment / Anaerobic Digestion plant, including but not limited to:

- Ultrastore™ Membrane Gasholder
- Eimix® Mechanical Sludge Mixer
- LM™ Mixer
- Sonolyzer™ Ultrasound Sludge Disintegrator



ovivo®connect℠

Ovivo® Connect℠ portal is an innovative and intuitive application that allows our customers to use 'SmartTags' installed on our equipment (or a web URL) to access a personalized customer zone. Access your equipment documentation, find contract references, track service logs, manage spare parts, and plan your next maintenance to get the most out of your equipment.

NEED **ACCESS** TO YOUR **O&M MANUAL**?
NEED **SPARE PARTS**?
WANT THE **LATEST TIPS AND NEWS** ON YOUR ASSET?

GET CONNECTED!
ovivo.co

LEARN MORE!
Scan to view online.

1.855.GO.OVIVO

info@ovivowater.com
ovivowater.com

OVIVO

MUNICIPAL WATEWATER
ANAEROBIC DIGESTION

EFFICIENT LOW ENERGY SLUDGE MIXING

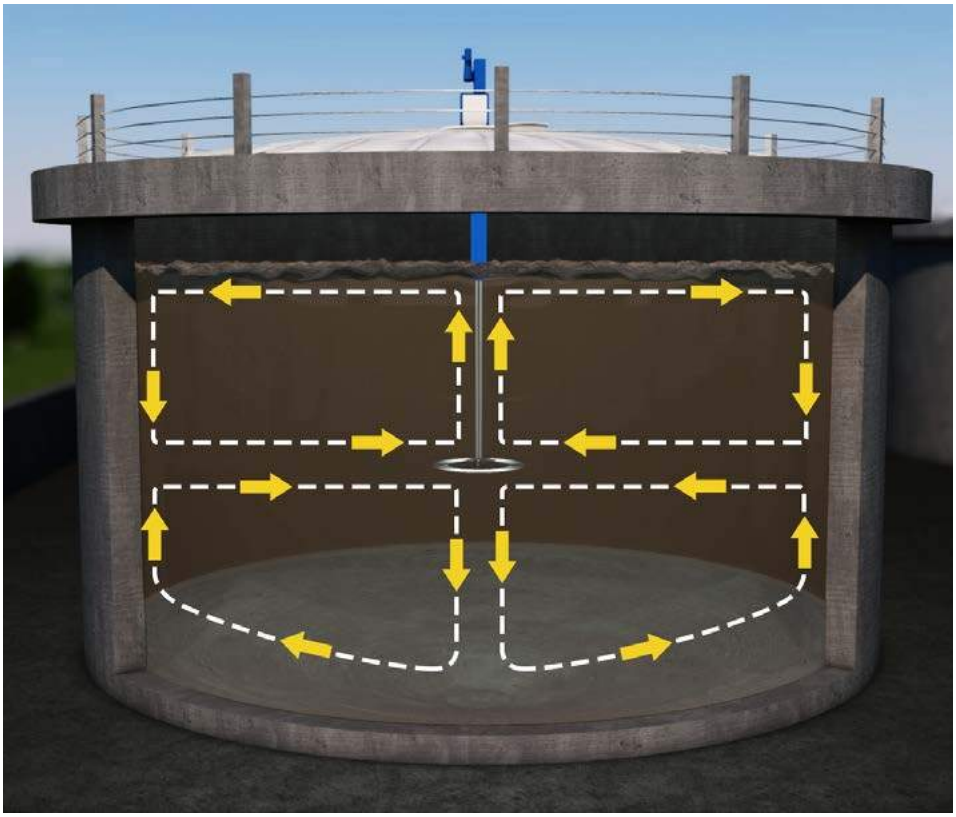
- Capable of mixing viscous fats, oils and greases
- Ragless design and low cost maintenance
- Significant energy savings compared to conventional mixing systems
- Installation and Capital cost savings
- Suitable for both new and existing tanks

Proven to achieve over 90% active tank volume! Give us a call at 1.855.GO.OVIVO to learn more.

LM™ MIXER

YouTube www.ovivowater.com

1.855.GO.OVIVO



ANAEROBIC DIGESTION

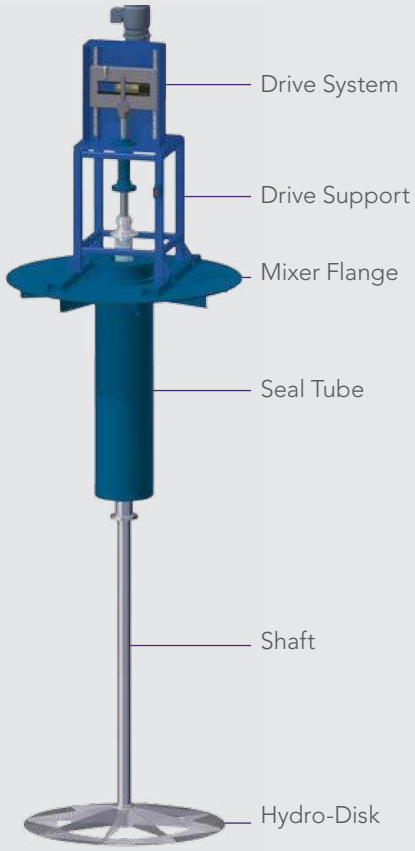
Anaerobic Digestion is highly dependent upon effective sludge mixing. When tank content is inadequately mixed, stratification occurs and the tank volume is not properly utilized. Most wastewater treatment facilities require thorough and complete mixing to ensure uniform temperature, solids distribution and microorganism contact with incoming sludge, to increase gas production and maximize the solids destruction.

MAJOR ENERGY SAVINGS

- Efficient mixing is critical; therefore, the goal is to achieve the optimal mixing efficiency with the least amount of power.
- Achieving a unique mixing pattern allows for efficient mixing while keeping the energy requirements lower (allowing for the amount saved to be used elsewhere at the plant).
- Independent full scale testing has proven the lower energy needs compared to conventional mixing systems.

ENGINEERING

DESIGNED FOR PERFORMANCE



MAIN CONFIGURATIONS FOR THE LM™ MIXER:

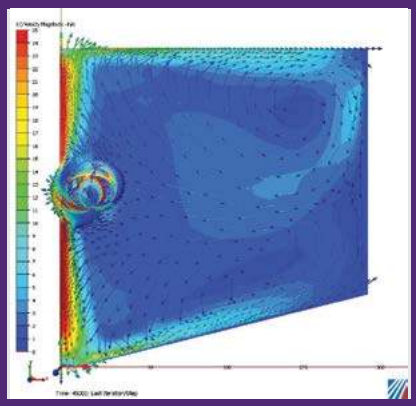
- Operating Speed:
  30 CPM (cycles per minute)
- Stroke Length:
  12 inches, 16 inches or 20 inches
- Disk Size:
  72 inches, 84 inches or 96 inches

LESS HP, MORE SAVINGS

Motor Size	1 Year	5 Years	10 Years	20 Years
10HP	$4,409	$25,558	$59,258	$159,275
90HP	$39,684	$230,023	$533,319	$1,433,471
Difference	$35,275	$204,465	$474,061	$1,274,197

Assuming $ 0.09/kWh, 75% nameplate power and 3% appreciation per year

HOW IT WORKS
UNIFORM MIXING



The LM™ mixer is designed to mix the viscous slurries in order to achieve a homogeneous mixture in the tank while using less energy at the same time. The LM mixer offers solutions to the challenges of mixing wastewater in both thin and thick sludge applications.

The frequency, stroke and size of the hydro-disk control the force and velocity of the liquid core. The LM mixer's oscillating motion produces a flow pattern that approaches nearly isotropic (uniform) mixing and does not display the turbulence intensity or vortices of rotary mixers. Additionally, LM mixers operate by using pulsating pressure waves in conjunction with the oscillating velocity. In this type of concurrent action the oscillating pressure wave and velocity are coupled together to enhance mass transfer and produce a uniform mixture of the tank's contents.

Each tank configuration is different and therefore the LM mixer is custom designed to meet a variety of mixing demands by varying the frequency, stroke and disk size. Utilizing the power of Computational Fluid Dynamics (CFD), tanks can be modeled and analyzed for proper mixer sizing.

KEY BENEFITS

EFFICIENT MIXING TO HELP IMPROVE THE DIGESTION PROCESS

- Does not rely on induced flow to create the necessary mixing.
- Rags do not build up on disk
- Uniform mixing throughout the tank

PROVEN TECHNOLOGY

- Multiple LiCl tests performed by third parties demonstrate an active volume of 90% or greater.

INSTALLATION COST SAVINGS

- Installation of a single mixer can be completed in a day or less.
- No additional piping needed.
- No core drilling necessary

SUITABLE FOR BOTH NEW AND EXISTING TANKS

- Little to no changes are needed on existing structures

THE **OVIVO** DIFFERENCE

200+ YEARS OF HERITAGE • 100% FOCUSED ON WATER

OUR EXPERTISE

Anaerobic Digestion is highly dependent upon effective sludge mixing. Ovivo sludge mixers are designed to provide powerful mixing, without accumulating stringy or fibrous material. Highly efficient and featuring low maintenance requirements, they can be used for existing or new digesters. Their configuration is adpated to suit best the specific tank design and application.

ANCILLARY EQUIPMENT

Ovivo can supply all plant required equipment for a complete Sludge Treatment / Anaerobic Digestion plant, including but not limited to:

- Ultrastore™ Membrane Gasholder
- Eimix® Mechanical Sludge Mixer
- Ovivo® Anaerobic Digester Steel Cover
- Sonolyzer™ Ultrasound Sludge Disintegrator

ovivo®connect℠

Ovivo® Connect℠ portal is an innovative and intuitive application that allows our customers to use 'SmartTags' installed on our equipment (or a web URL) to access a personalized customer zone. Access your equipment documentation, find contract references, track service logs, manage spare parts, and plan your next maintenance to get the most out of your equipment.

NEED **ACCESS** TO YOUR **O&M MANUAL**?
NEED **SPARE PARTS**?
WANT THE **LATEST TIPS AND NEWS** ON YOUR ASSET?

GET CONNECTED!
ovivo.co

LEARN MORE!
Scan to view online.

1.855.GO.OVIVO

info@ovivowater.com
ovivowater.com

OVIVO

MUNICIPAL WATEWATER
ANAEROBIC DIGESTION

AUTOMATIC TROUBLE-FREE, EFFECTIVE SLUDGE MIXING

- Ease of operation and maintenance
- Heat exchanger jacket compatibility
- Ragless propeller design
- Improved uptime & long continuous service periods
- Removable mixing mechanism to avoid de-gassing or de-watering the digester

Interested in preventing fouling while retaining high efficiency? Call us at 1.855.GO.OVIVO to learn more!

EIMIX® MECHANICAL SLUDGE MIXER

DC WASA, DC: (5) RDT-T-25-36
Largest RDT-T In USA

ANAEROBIC DIGESTION

Anaerobic Digestion is highly dependent upon effective sludge mixing. When tank content is inadequately mixed, stratification occurs and the tank volume is not properly utilized. Most wastewater treatment facilities require thorough and complete mixing to ensure uniform temperature, solids distribution and microorganism contact with incoming sludge, to increase gas production and maximize the solids destruction.

Reversing motor

BUT WHY CHOOSE THE EIMIX® MIXER?

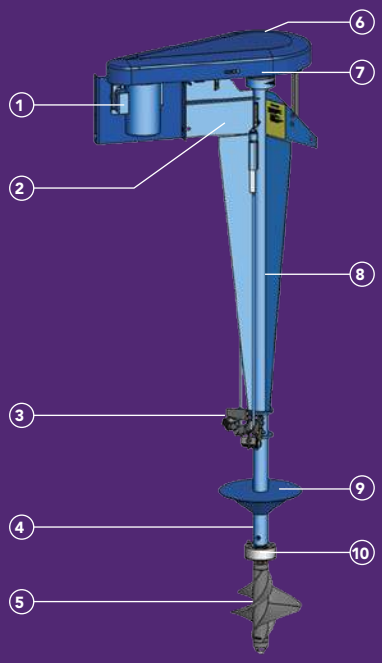
MECHANISM

- Eimix® ragless propellers have been designed to run clean without accumulation of stringy and fibrous material. This design prevents fouling while retaining high efficiency and low maintenance requirements.
- Positive Lower Lubrication:
  - Oil lubrication provides a positive pressure to the lower bearing
  - Dipstick for manual inspection and monitoring
  - Electronic oil level sensor available (SCADA compatible)
- Upper bearing is located well above liquid level, next to the motor, with the lower bearing next to the propeller. This increases bearing span and minimizes overhung loads for extended bearing life.

BENEFITS

- Use of a reversing motor enables to pump sludge with equivalent capacity in both directions, which maximizes system flexibility by altering mixing dynamics.
- Mixer assembly can be removed without dewatering or degassing the digester.

ENGINEERING
DESIGNED FOR PERFORMANCE



1. Reversible, Explosion-Proof, Inverter Duty Motor
2. Oil Dipstick
3. Adjustable Centering Device
4. Lower Shaft Housing
5. EIMIX® Ragless Reversible Propeller
6. Belt Guard (FRP / Stainless Steel)
7. Upper Bearing
8. Upper Shaft Housing
9. Flow Deflector
10. Mechanical Seal and Lower Bearing

DRAFT TUBE MIXERS

- Internal roof mounted (RDT) or external (EDT) draft tube design.
- Available for installation on existing, new, primary or secondary digesters.
- One or more units can be installed to suit specific mixing needs.
- Optional heat exchanger jackets reduce maintenance, installation and operational costs while providing effective, uniform heating for the digester.

EIMIX® RDT TYPE MIXERS

Mounted on the tank cover, this design allows the upper draft tube and mixer mechanism to be easily removed.

One or more RDT mixers can be distributed across the tank or can be installed in conjunction with an EDT mixer for additional scum breaking and mixing capacity.

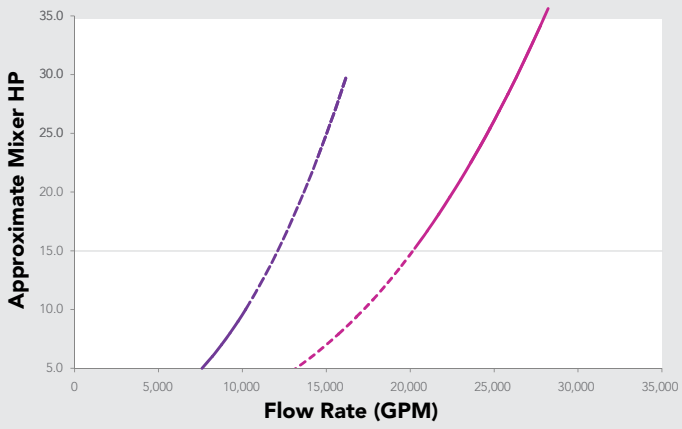
EIMIX® EDT TYPE MIXERS

Easy access for maintenance is achieved by mounting the mixer outside of the tank.

Maximum energy input occurs at the periphery of the tank near the surface and at the bottom of the tank, creating a tangential, spiral flow pattern within the tank. Includes a maintenance platform for easy access.

HONOULIULI WWTP, HI:
(3) EDT-TJ-10-24

CERTIFIED CURVES



24" PROPELLER
< 10 hp (Recommended)
> 10 hp

36" PROPELLER
< 15 hp (Recommended)
> 15 hp

The Eimix propellers are offered in two diameters:

- 24" diameter, typically recommended for mixers between 5 and 10 hp
- 36" diameter, typically used for mixers greater than 15 hp.

This performance graph included the pump up operation. Ovivo's design offers equivalent capacity.

THE **OVIVO** DIFFERENCE

200+ YEARS OF HERITAGE • 100% FOCUSED ON WATER

OUR EXPERTISE

Anaerobic Digestion is highly dependent upon effective sludge mixing. Ovivo sludge mixers are designed to provide powerful mixing, without accumulating stringy or fibrous material. Highly efficient and featuring low maintenance requirements, they can be used for existing or new digesters. Their configuration is adpated to suit best the specific tank design and application.

ANCILLARY EQUIPMENT

Ovivo can supply all plant required equipment for a complete Sludge Treatment / Anaerobic Digestion plant, including but not limited to:

- Ultrastore™ Membrane Gasholder
- LM™ Mixer
- Ovivo® Anaerobic Digester Steel Cover
- Sonolyzer™ Ultrasound Sludge Disintegrator

ATOTONILCO PTAR, MEXICO:
(1) RDT-T-75-36 with over 60' long Draft tubes.

ovivo®connect℠

Ovivo® Connect℠ portal is an innovative and intuitive application that allows our customers to use 'SmartTags' installed on our equipment (or a web URL) to access a personalized customer zone. Access your equipment documentation, find contract references, track service logs, manage spare parts, and plan your next maintenance to get the most out of your equipment.

NEED **ACCESS** TO YOUR **O&M MANUAL**?
NEED **SPARE PARTS**?
WANT THE **LATEST TIPS AND NEWS** ON YOUR ASSET?

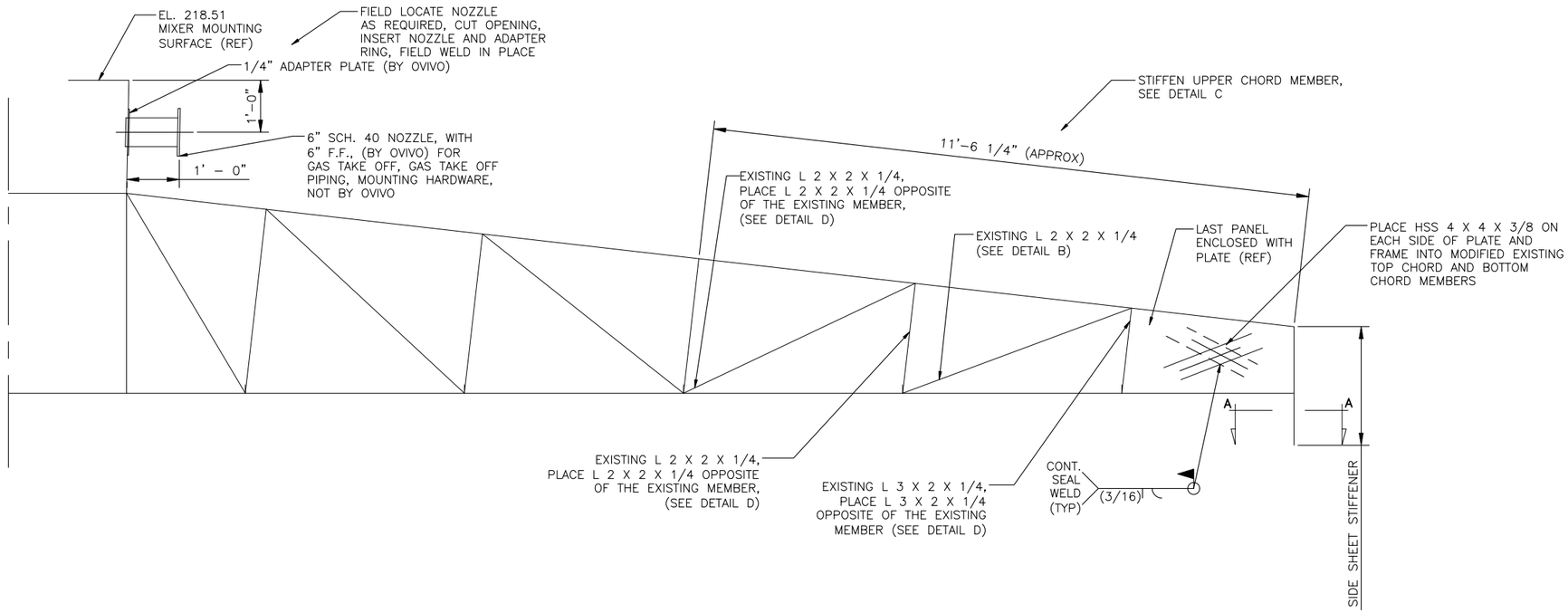
GET CONNECTED!
ovivo.co

EIMIX® RAGLESS PROPELLER

LEARN MORE!
Scan to view online.

1.855.GO.OVIVO

info@ovivowater.com
ovivowater.com



EXISTING RADIAL TRUSS

(TYPICAL (10) PLACES)

NOTES:

1. OVIVO WILL SUPPLY ONE (1) LOT OF STEEL SHAPES TO MODIFY EXISTING TRUSS COVER TO WITHSTAND THE IMPOSED LOADS OF THE NEW LM MIXER UNIT.
2. THE SUPPLIED STRUCTURAL SHAPES ARE ASTM A36 STRUCTURAL STEEL, ASTM A500C STRUCTURAL TUBING AND ASTM A53 PIPING.
3. AT ALL LOCATIONS WHERE FIELD MODIFICATION OF EXISTING MEMBERS ARE REQUIRED, THE EXISTING CONCRETE INSULATION MUST BE REMOVED TO INSURE PROPER WELDING OF THE NEW MEMBERS TO THE EXISTING BOTTOM CHORD MEMBER.
4. WHEN REMOVING THE EXISTING CONCRETE INSULATION, PLEASE CONFIRM DIMENSIONS OF THE EXISTING BOTTOM CHORD MEMBER.
5. EXISTING MEMBERS REQUIRE FIELD SURFACE PREPARATION AND PAINTING TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE CONNECTION AND MEMBERS.
6. AFTER THE FIELD MODIFICATION OF THE EXISTING TRUSS MEMBERS HAVE BEEN COMPLETED AND THE INSTALLATION OF THE NEW MIXER ASSEMBLY HAS BEEN INSTALLED, THE COVER MUST BE CHECKED / TESTED FOR AIR TIGHT CONDITION. TESTING IS NOT BY OVIVO.
7. ALL FIELD WELDING IS NOT BY OVIVO. FIELD WELDING TO CONFORM TO THE LATEST EDITION OF THE AWS STANDARDS D1.1. ALL FIELD WELDING IS TO BE SHIELDED ARC, WITH WELDER QUALIFICATIONS PER THE LATEST EDITION OF THE AWS STANDARDS D1.1.
8. ALL STEEL TO BE U.S.A DOMESTIC STEEL WITH MIL CERTIFICATION.
9. STEEL SHAPES WILL BE SUPPLIED IN STANDARD LENGTHS TO BE FIELD CUT TO FIT EXISTING FIELD CONDITIONS
10. AFTER THE COVER MODIFICATIONS IS COMPLETED AND MIXER ASSEMBLY IS INSTALLED AND THE DIGESTER COVER IS PRESSURE TESTED, THE COMPLETED DIGESTER COVER ASSEMBLY MUST BE BALANCED AND LEVELED TO INSURE PROPER COVER TRAVEL.

DRAFT - FOR REVIEW ONLY

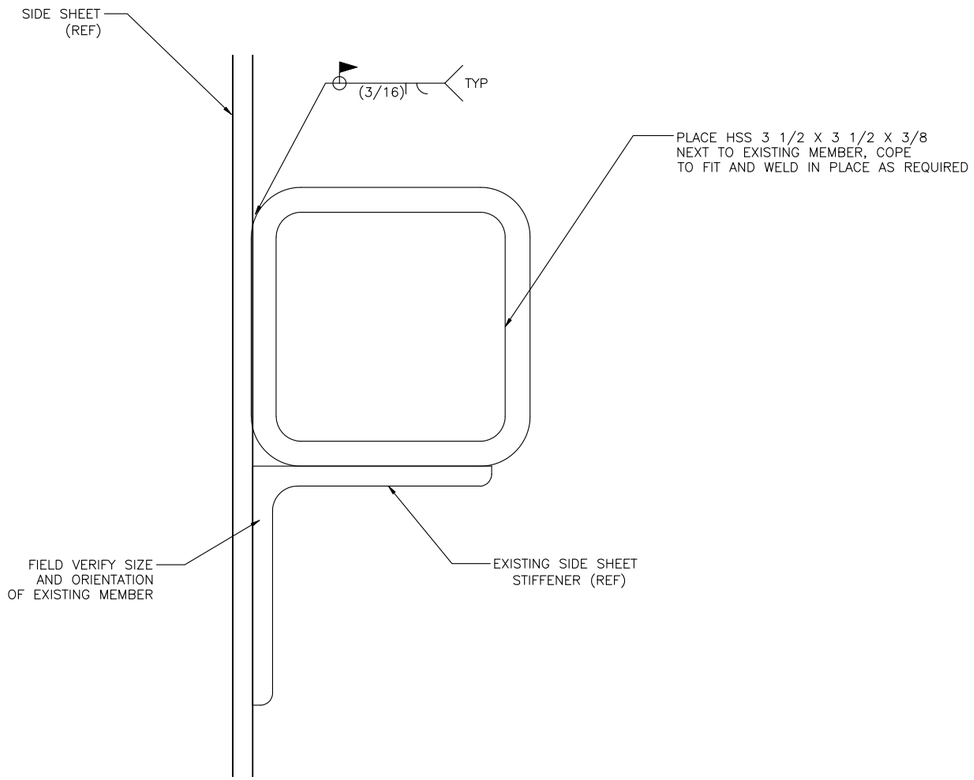
THIS DRAWING IS CERTIFIED FOR:

CUSTOMER:	SHERWOOD-LOGAN & ASSOC. INC.
CUSTOMER ORDER NO.:	16-145-1
OVIVO ORDER NUMBER:	CSW0001084-02
PROJECT:	WYOMISSING VALLEY, STP.
PROJECT LOCATION:	READING, PA
CONSULTING ENGINEER:	ARRO CONSULTING
BY: JAMES R. SEALE, P.E.	DATE: JUNE 24, 2016

OVIVO
Bringing water to life

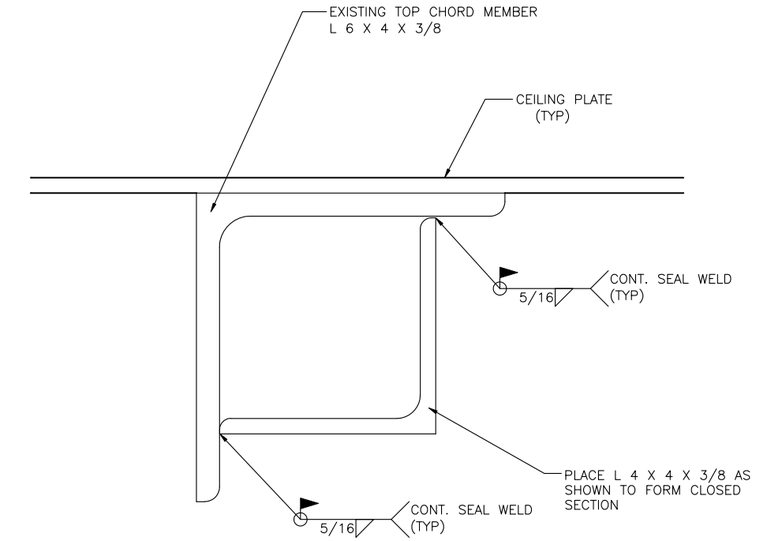
RADIAL TRUSS MODIFICATION
FOR
EXISTING TRUSS COVER

INITIAL RELEASE	-	-	-	--/--	A	REF. FROM:	-	DO NOT SCALE PRINTS	DWG. NO.	CSW1084-201	SHEET 1 OF 2	REV A
REVISION	EN/ECO	BY	CHECK'D	DATE		DATE (mm/dd/yyyy)	6-21-2016	WORKMANSHIP STANDARD ES0001 APPLIES				
						DRAWN	JRS	ORIGINAL S.O.				
						CHECK'D	JLQ	-				



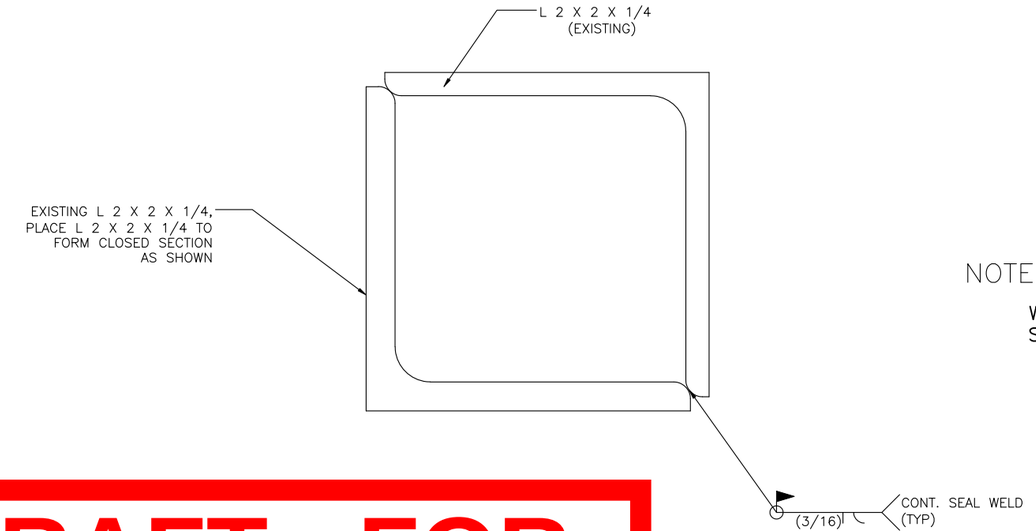
SECTION A – A

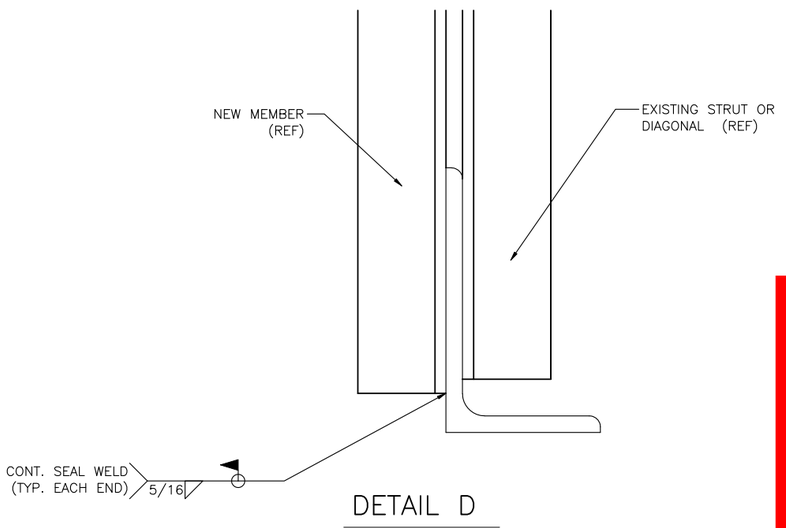
(ROTATED 90°)



DETAIL C

(UPPER CHORD STIFFENING DETAIL)





DETAIL D

NOTE :

WORK WITH DRAWING CSW1084–201,
SHEET 1 OF 2

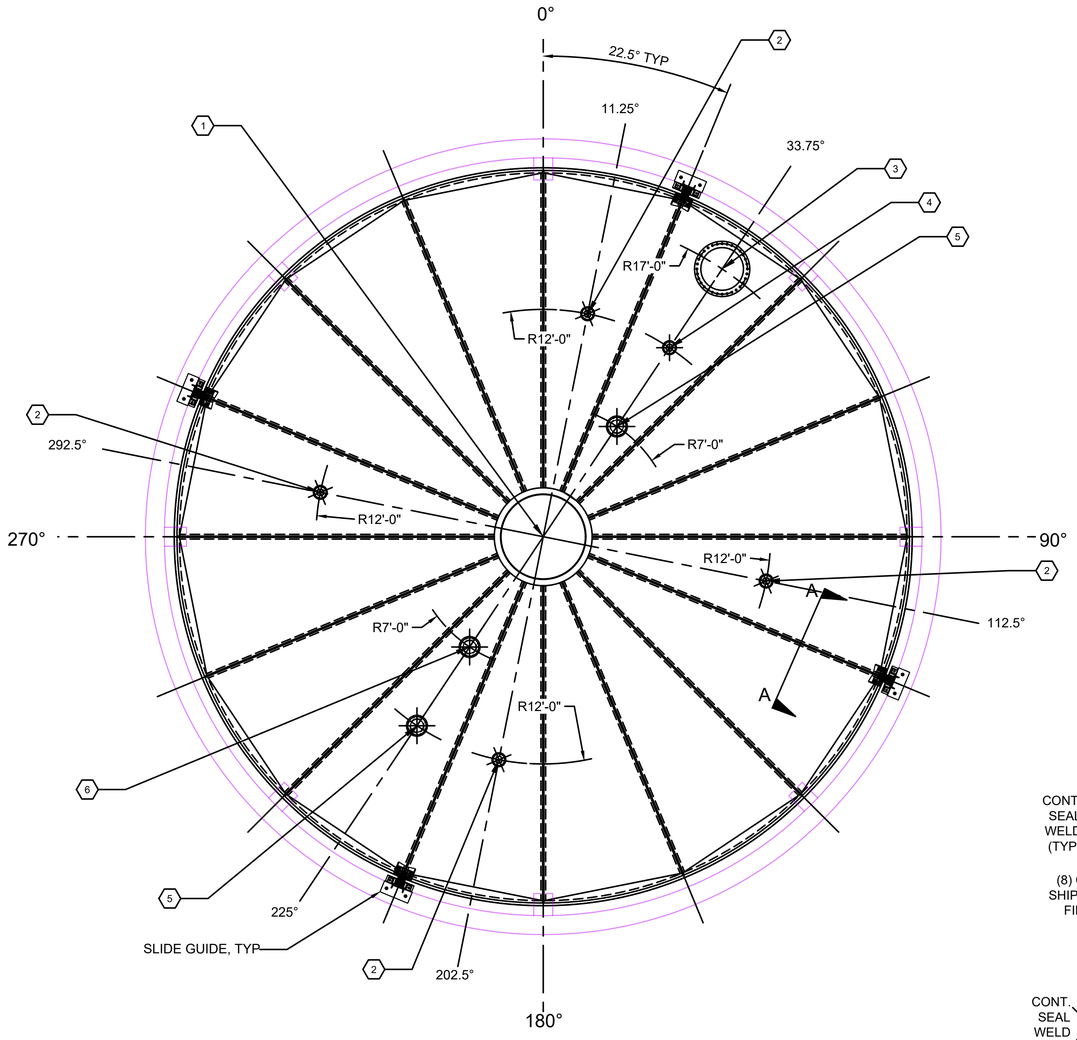
THIS DRAWING IS CERTIFIED FOR:

CUSTOMER:	SHERWOOD-LOGAN & ASSOC. INC.
CUSTOMER ORDER NO.:	16-145-1
OVIVO ORDER NUMBER:	CSW0001084-02
PROJECT:	WYOMISSING VALLEY, STP.
PROJECT LOCATION:	READING, PA
CONSULTING ENGINEER:	ARRO CONSULTING
BY: JAMES R. SEALE, P.E.	DATE: JUNE 24, 2016

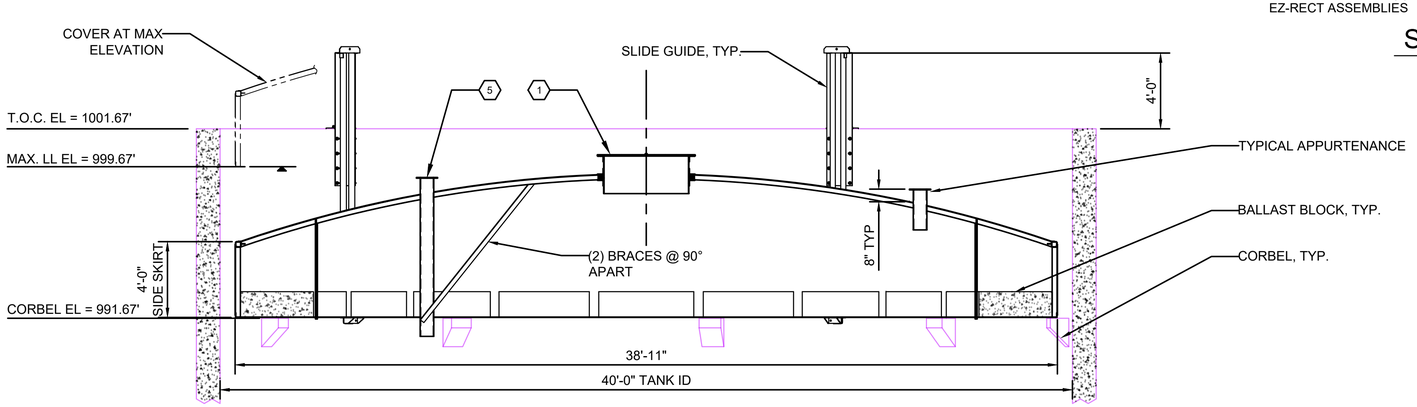
OVIVO
Bringing water to life

D	DO NOT SCALE PRINTS	DWG. NO.	CSW1084-201	SHEET 2 OF 2	REV A

WORKMANSHIP STANDARD ES0001 APPLIES



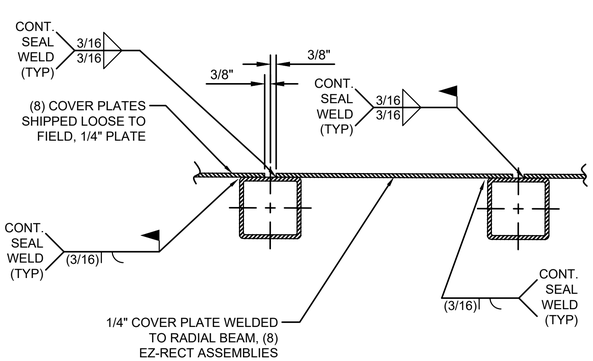
PLAN VIEW



ILLUSTRATIVE SECTION

APPURTENANCES:

1. (1) 4'–5½" I.D. STEEL CENTER COMPRESSION FOR MOUNTING LM MIXER ASSEMBLY. GASKET AND 316SS MOUNTING HARDWARE BY OVIVO.
2. (4) 4" DIA. SCH. 40 DISCHARGE LANCE PORTS, 150# F.F. GASKETS AND 316SS MOUNTING HARDWARE BY OVIVO.
3. (1) 28" DIA. MANHOLE, 150 # F.F. GASKET AND 316SS MOUNTING HARDWARE BY OVIVO. MANHOLE COVER NOT BY OVIVO.
4. (1) 4" SCH. 40 GAS WITHDRAWL, 150# F.F. GASKET AND 316SS MOUNTING HARDWARE BY OVIVO.
5. (2) 8" SCH. 40 SAMPLING WELL PORTS, 150# F.F. GASKET AND 316SS MOUNTING HARDWARE BY OVIVO. PORT COVER NOT BY OVIVO.
6. (1) ONE, 8" SCH. 40 GAS SAFETY EQUIPMENT NOZZLE, 150# F.F. GASKET AND 316SS MOUNTING HARDWARE BY OVIVO.



SECTION A - A

NOTES:

1. OVIVO WILL PROVIDE TWO (2) 40' – 0" TYPE G1V GAS HOLDER DIGESTER COVERS AS SHOWN AND NOTED.
2. MINIMUM PLATE THICKNESS IS 1/4" , UNLESS NOTED OTHERWISE.
3. ALL EPOXY ANCHOR BOLTS ARE 316 S.S. AND FLANGE FASTENERS ARE 316 S.S. FASTENERS AND ASSEMBLY BOLTS ARE BLACK STEEL. ALL ASSEMBLY BOLTS AND TABS TO BE REMOVED WHEN FIELD WELDING IS COMPLETED.
4. COVER ERECTION REQUIRES FIELD WELDING. FIELD WELDING IS NOT BY OVIVO. SHOP WELDING AND FIELD WELDING TO CONFORM TO THE LATEST EDITION OF THE AWS STANDARDS D1.1. ALL SHOP AND FIELD WELDING TO BE SHIELDED ARC, WITH WELDER QUALIFICATIONS PER LATEST EDITION OF THE AWS STANDARDS D1.1.
5. HOLES FOR ALL APPURTENANCES ARE TO BE FIELD CUT, SOME FIELD CUTTING / TRIMMING MAY BE REQUIRED, TRIMMING / CUTTING IS NOT BY OVIVO.
6. THE TOTAL WEIGHT OF EACH COVER IS APPROXIMATELY 31,000 LBS.
7. THE COVER IS FABRICATED WITH ASTM A36 STRUCTURAL STEEL PLATE, ASTM A53 PIPES AND ASTM A500B STRUCTURAL TUBING. THE COVER IS DESIGNED TO WITHSTAND ALL NORMAL OPERATING DEAD LOADS, INCLUDING THE WEIGHT OF THE INSULATION. IN ADDITION TO THE NORMAL OPERATING DEAD LOADS, THE COVER WILL WITHSTAND THE

   12 MIXER DEAD LOAD
   VATER COLUMN (10.4 PSF)
   THE OPERATIONAL FORCE, EQUIVALENT STATIC FORCE

   ELOCITY OF 120 MPH, EXP. C
   RE DUE TO 16" W.C.

   ND EXTREME CARE SHOULD BE EXERCISED WHEN
   T. OVIVO WILL NOT BE RESPONSIBLE FOR ANY LOSS
   IS EQUIPMENT.

9. SURFACE PREPARATION: NONE
   SHOP PAINTING: NONE, SHIPPED BARE METAL
10. ROOFING, INSULATION, FIELD WELDING, SLIP RESISTANT SURFACES, HANDRAIL, WALKWAYS, ACCESS LADDERS, FIELD PAINTING, AND SEALANTS ARE NOT BY OVIVO, UNLESS NOTED OTHERWISE.
11. OVIVO WILL PROVIDE ONE SAFETY SIGN AS SHOWN. THE SIGN SHALL BE INSTALLED IN A CONSPICUOUS AND NON–HAZARDOUS LOCATION ON THE COVER AS DETERMINED BY THE CUSTOMER. OVIVO WILL SUPPLY THE MOUNTING BRACKET AND HARDWARE FOR THE SIGN.
12. TO ENSURE PROPER OPERATION OF THE COVER, THE TANK MUST BE ROUND AND PLUMB WITHIN ±1/2" ON RADIUS FOR THE ENTIRE TANK WALL. THIS REQUIREMENT IS TO BE FIELD VERIFIED BY THE CONTRACTOR. IF THE TANK IS FOUND TO BE OUT OF TOLERANCE OVIVO IS TO BE NOTIFIED IMMEDIATELY PRIOR TO THE COVER FABRICATION. OVIVO WILL NOT BE RESPONSIBLE FOR ANY ISSUES ASSOCIATED WITH A TANK THAT IS OUT OF TOLERANCE.
13. ALL EQUIPMENT IS TO BE TAGGED WITH THE CLIENT'S P.O. NUMBER. SEE TAGGING NSTRUCTIONS.
14. AN (*) ASTERISK WHEN SHOWN DENOTES A VARIANCE FROM THE CONTRACT DOCUMENTS AND SHOULD BE PARTICULARLY NOTED.
15. SOME FIELD TRIMMING AND ADJUSTING MAY BE REQUIRED TO ENSURE PROPER FIT UP. FIELD TRIMMING AND WELDING IS NOT BY OVIVO.
16. THE COVER IS DESIGNED FOR A MAXIMUM PRESSURE OF 16" W.C. THE MAXIMUM OPERATING PRESSURE IS 10" W.C. THE PRESSURE RELIEF VACUUM BREAKER VALVE IS TO BE SET AT THE FOLLOWING:
    RELIEF PRESSURE: 11" W.C.
    VACUUM PRESSURE: 2" W.C.
17. CONTRACTOR / ENGINEER TO CONFIRM TANK DIMENSIONS, SIZE, WALL THICKNESS, ELEVATIONS, AND ORIENTATION RELATIVE TO TRUE NORTH.

RELEASED FOR INFORMATION		ADM		8/21/20	A	DRAWN	ADM	ORIGINAL S.O.	DWG. NO.	MT_VERNON-201	SHEET 1 OF 1	REV D
REVISION	EN/ECO	BY	CHECK'D	DATE		CHECK'D	ECH	CSW000				

OVIVO
Worldwide Experts in Water Treatment

GENERAL ARRANGEMENT
40' - 0" DIA. (G1V) EZ-RECT
DIGESTER COVER

MIXING SYSTEMS MODIFICATION

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
LM™ Mixer Option					
Mobilization/Demobilization	1	LS	$ 25,000.00	$/LS	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New LM™ Linear Motion Mixer (Ovivo LM12/7.5/72), Complete	2	**EA**	$ 190,000.00	**$/EA**	$ 380,000.00
New LM™ Mixer Installation Cost	2	**EA**	$ 25,000.00	**$/EA**	$ 50,000.00
Demolition & Removal of Existing Digester Structures and Relocation of Existing Supernatant Screen	1	**LS**	$ 75,000.00	**$/LS**	$ 75,000.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Sub-Total					**$ 555,000.00**

SUBTOTAL	**$**	**555,000.00**
Contingency (10%)	$	56,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**611,000.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**183,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**794,000.00**
SAY	**$**	**794,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Estimated Yearly O&M (LM Mixer)	$	22,000.00
Sub-Total	**$**	**22,000.00**

Total Yearly O&M Costs	$	22,000.00
Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	794,000.00
Annual O&M Cost	$	22,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718
Equilavlent Annual Operating Cost (EAOC)	$	71,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	794,000.00
Annual O&M Cost	$	22,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334
Present Worth of Annual O&M Cost	$	359,731.53
Net Present Value	$	1,153,731.53

NPV = Total Capital Cost + Present Worth of Annual O&M

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Eimix® External Draft Tube Mixer Option					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New Eimix® External-Mounted Draft Tube Mixer (Ovivo EDT-T/5/24), Complete	4	**EA**	$ 122,500.00	**$/EA**	$ 490,000.00
New Eimix® External-Mounted Draft Tube Mixer Installation Cost	4	**EA**	$ 75,000.00	**$/EA**	$ 300,000.00
EDT Platform Access Stairs	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Sub-Total					**$ 865,000.00**

SUBTOTAL	**$**	**865,000.00**
Contingency (10%)	$	87,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**952,000.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**286,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**1,238,000.00**
SAY	**$**	**1,238,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Estimated Yearly O&M (Eimix Draft Tube & Access)	$	41,000.00
Sub-Total	**$**	**41,000.00**

Total Yearly O&M Costs	$	41,000.00
Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	1,238,000.00
Annual O&M Cost	$	41,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718
Equilavlent Annual Operating Cost (EAOC)	$	117,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	1,238,000.00
Annual O&M Cost	$	41,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334
Present Worth of Annual O&M Cost	$	670,408.77
Net Present Value	$	1,908,408.77

NPV = Total Capital Cost + Present Worth of Annual O&M

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Eimix® Roof-Mounted Draft Tube Mixer Option					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New Eimix® Roof-Mounted Draft Tube Mixer (Ovivo EDT-T/7.5/24), Complete	2	**EA**	$ 122,500.00	**$/EA**	$ 245,000.00
New Eimix® Roof-Mounted Draft Tube Mixer Installation Cost	2	**EA**	$ 75,000.00	**$/EA**	$ 150,000.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Demolition & Removal of Existing Digester Structures and Relocation of Existing Supernatant Screen	1	**LS**	$ 75,000.00	**$/LS**	$ 75,000.00
Sub-Total					**$ 520,000.00**

SUBTOTAL	**$**	**520,000.00**
Contingency (10%)	$	52,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**572,000.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**172,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**744,000.00**
	SAY $	**744,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY	Yearly Operations Cost
Estimated Yearly O&M (Eimix Roof Mounted)	$ 20,000.00
Sub-Total	**$ 20,000.00**

Total Yearly O&M Costs	$	20,000.00
Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	744,000.00
Annual O&M Cost	$	20,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718
Equilavlent Annual Operating Cost (EAOC)	$	66,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02
Planning Period (n = Life Expectancy)		20
Total Capital Cost	$	744,000.00
Annual O&M Cost	$	20,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334
Present Worth of Annual O&M Cost	$	327,028.67
Net Present Value	$	1,071,028.67

NPV = Total Capital Cost + Present Worth of Annual O&M

Ovivo USA, LLC
4246 Riverboat Road, Suite 300
Salt Lake City, Utah
84123-2583
USA

Telephone: 801.931.3000
Facsimile: 801.931.3080

www.ovivowater.com

OVIVO
Worldwide Experts in Water Treatment

Mt. Vernon WWTP, OH – LM™ vs. Draft Tube Mixer Life Cycle

The following study illustrates the difference between the Linear Motion (LM™) Mixer and Draft Tube Mixers for upgrading the **two (2) 40 ft diameter anaerobic digesters** at the Mt. Vernon WWTP, OH. Below are some of the cost data and assumptions on energy costs and rates utilized in the calculations.

Assumptions:

Parameter	Units	Value
Energy Cost	$/kWh	$0.06
Energy Cost Escalation	%/year	3%
Evaluation Timeframe	Years	20
Discount Rate	%/year	2%

Capital Cost Information:

Parameter	LM™ Mixer	EDT Draft Tube	RDT Draft Tube
Quantity	2	4	2
Equipment Cost	$380,000	$490,000	$245,000
Power Consumption per Mixer	7.5	5	7.5
Utilization	50%	75%	75%
Total HP	15	20	320

Based on the above assumptions and cost estimates, following were the results obtained for the costs for installation, operation and maintenance of the different mixing systems.

Energy Consumption Comparison:

The tables below show comparisons with different scenarios to show the amount of energy savings that can be achieved:

LM™ Mixer Vs EDT Draft Tube Mixing System				
Motor Size	Years			
	1	5	10	20
LM 7.5 HP @ 50%	$1,470	$7,347	$15,062	$31,668
DT 5 HP @ 75%	$2,940	$14,695	$30,124	$63,336
Difference	**$1,470**	**$7,347**	**$15,062**	**$31,668**
Total Difference	***$2,940***	***$14,695***	***$30,124***	***$63,336***

LM™ Mixer Vs RDT Draft Tube Mixing System				
Motor Size	Years			
	1	5	10	20
LM 7.5 HP@ 50%	$1,470	$7,347	$15,062	$31,668
DT 7.5 HP@ 75%	$2,205	$11,021	$22,593	$47,502
Difference	**$735**	**$3,674**	**$7,531**	**$15,834**
Total Difference	***$1,470***	***$7,347***	***$15,062***	***$31,668***

The analysis showed Operational Cost Savings of **$30-65k** over a 20 year evaluation in favor of the LM™ Mixer over a Draft Tube Mixing System.

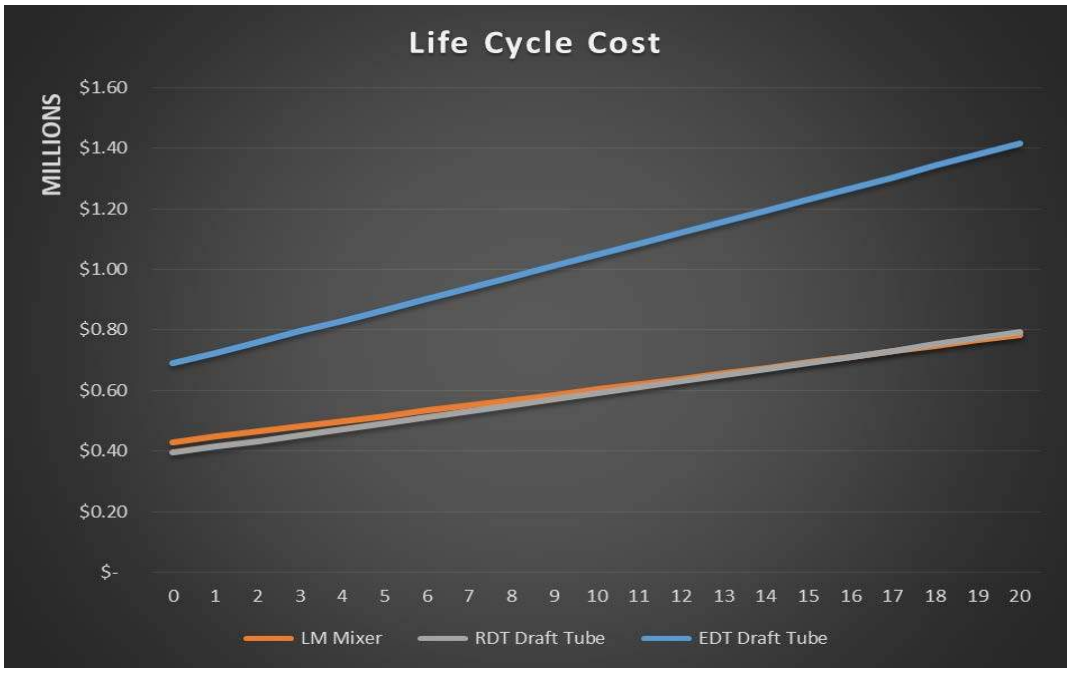
If Installation and Maintenance Costs are also included in the evaluation, the analysis further strengthens the case of the superiority of the LM™ Mixers over the alternatives, as seen below.

	LM™ Mixer	EDT Draft Tube	RDT Draft Tube
Quantity	2	4	2
Equipment Cost	$380,000	$490,000	$245,000
Estimated Install Costs	$50,000	$200,000	$150,000
Yearly O&M	$17,050	$35,050	$19,000
20 Year Life Cycle Cost (NPV)	**$783,538**	**$1,416,436**	**$793,950**

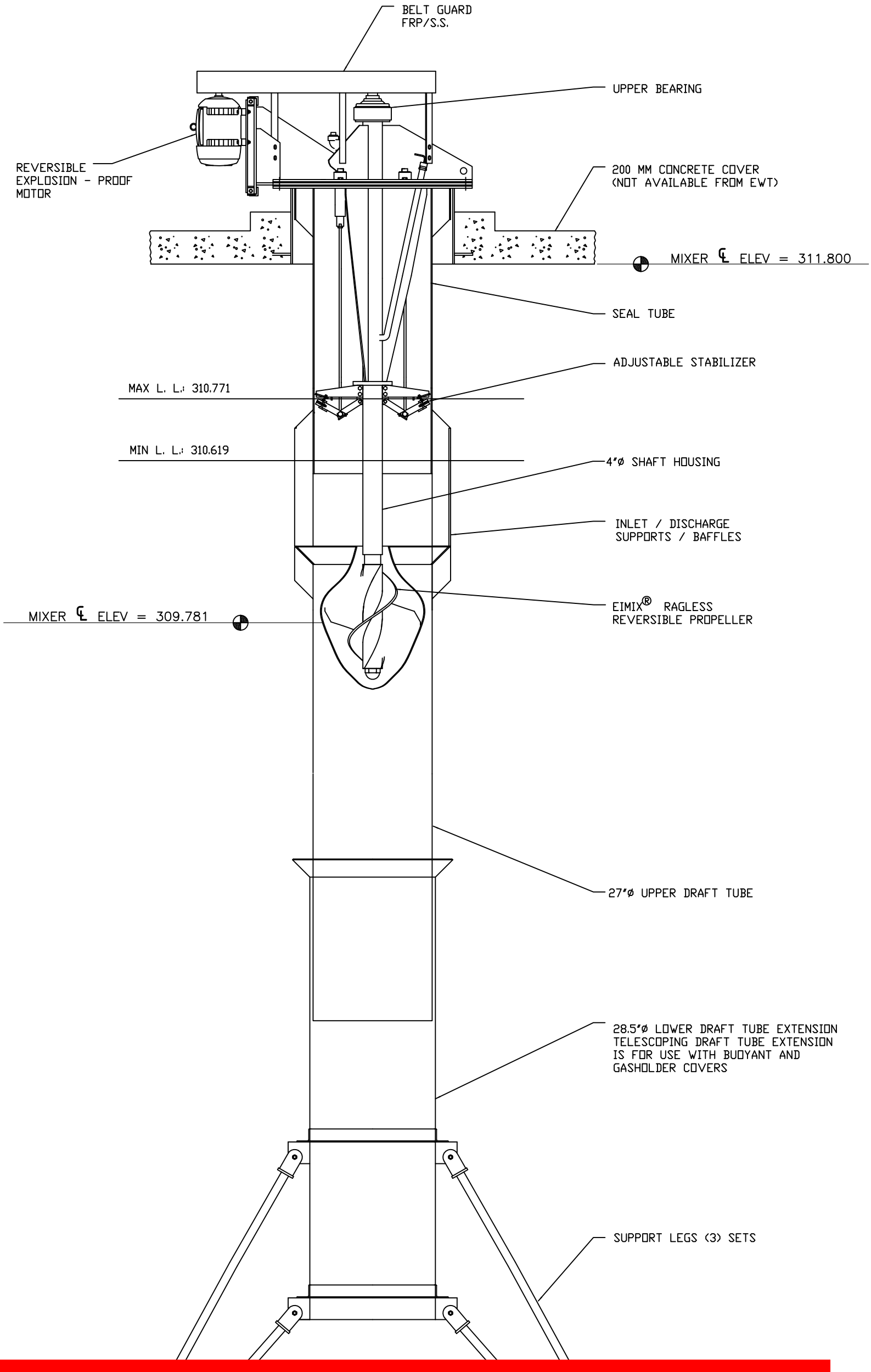
Conclusions:

Based on our experience, Ovivo recommends the use of our LM™ Mixers as it offers the following advantages:

- Less capital costs
- Less energy/operation costs (as shown in the tables above)
- Lower installation costs
- Lower maintenance costs



With the above advantages, it can be found that the **LM™ Mixer will be the most cost effective option from a life cycle (NPV) analysis** for the Mt. Vernon WWTP, OH Upgrade as can also be seen in the table and graph above.



ECO	BY	CHECK'D	DATE
A			

INITIAL RELEASE

REVISION

EIMCO WATER TECHNOLOGIES

ORIGINAL S.O.

	DATE
DRAWN	4-8-99
CHECK'D	RLJ
JW	-

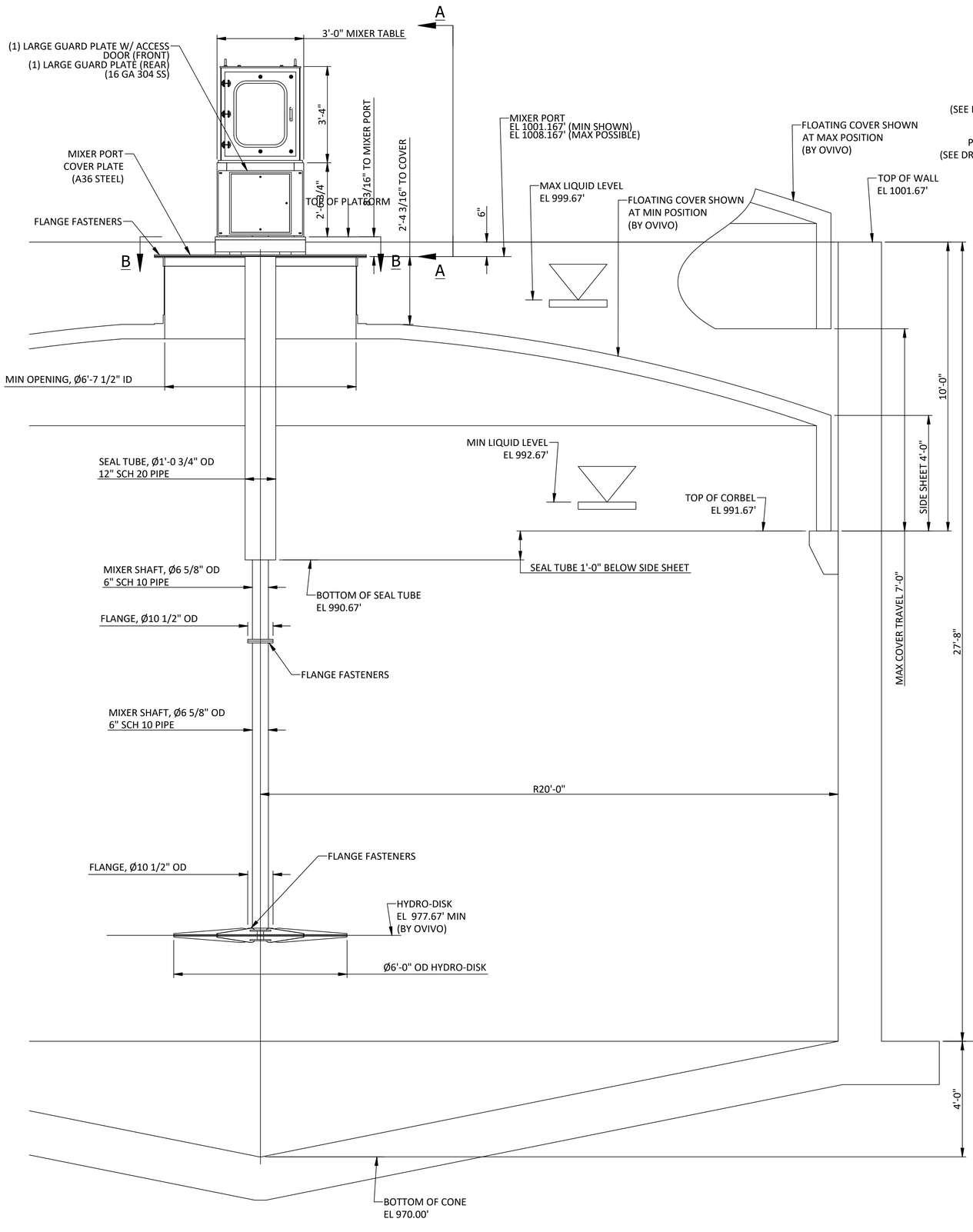
EIMIX® SLUDGE MIXER
TYPES RDT-7 & RDT-JT
GENERAL ARRANGEMENT

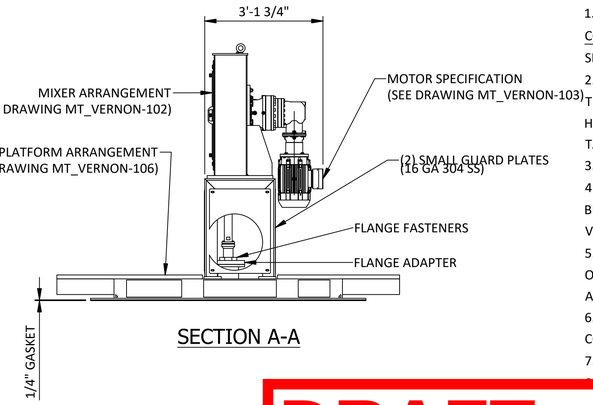
DWG. NO. 906100

REV A

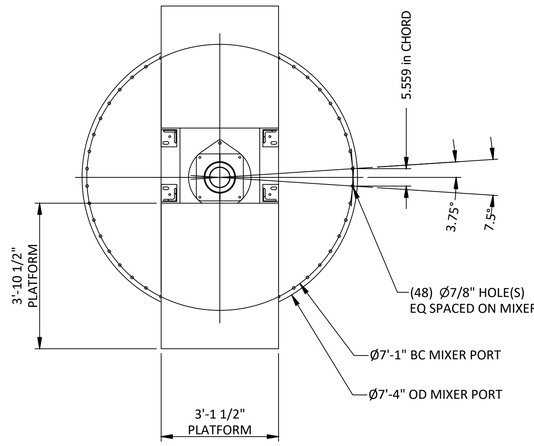
REF. FROM: -

SHEET 1 OF 1





SECTION A-A



SECTION B-B
MIXER PORT COVER PLATE

NOTES

1. OVIVO WILL SUPPLY ONE (1) LINEAR MOTION (LM) MIXER MECHANISM(S) FOR MOUNTING ON NEW TANK COVER(S). THE LM MIXER SHALL BE SUPPORTED FROM THE TANK COVER AND SHALL BE CAPABLE OF MIXING SLUDGE WITHIN THE DIGESTION TANK.
2. OVIVO WILL SUPPLY ONE (1) SOLID HYDRO-DISK PER LM MIXER MECHANISM MOUNTED AT THE END OF THE VERTICAL MIXER SHAFT. THE DESIGN SHALL CREATE A VERTICAL "UP AND DOWN" MOTION OF THE HYDRO-DISK PRODUCING A TURBULENT "LIQUID-CORE" ABOVE AND BELOW THE HYDRO-DISK THAT MIXES THE TANK.
3. THE SHAFT AND HYDRO-DISK WILL RECIPROCATE 12 INCHES AT APPROXIMATELY 30 CYCLES PER MINUTE.
4. AN ASTERISK (*) WHERE SHOWN DENOTES A VARIANCE FROM THE CONTRACT DOCUMENTS AND SHOULD BE PARTICULARLY NOTED OR ADDRESSED. DIMENSIONS OR ELEVATIONS MARKED WITH "CLOUDS" REQUIRE VERIFICATION BEFORE FABRICATION CAN PROCEED.
5. HYDRO-DISK MUST BE SUBMERGED BY AT LEAST FOUR (4) FEET OF LIQUID DURING LM MIXER OPERATION. OVIVO WILL NOT BE RESPONSIBLE FOR DAMAGE INCURRED IF HYDRO-DISK IS NOT SUBMERGED AS SPECIFIED ABOVE.
6. ALL STRUCTURAL STEEL TO BE ASTM A36 OR A53 UNLESS OTHERWISE NOTED. SHOP WELDING IS TO CONFORM TO THE LATEST EDITION OF THE A.W.S. STANDARDS D1.1.
7. SURFACE PREPARATION AND PAINT SPECIFICATION (SEE DRAWING MT_VERNON-104).

ATION.
FITTINGS; LUBRICATING
EMOLITION,
PECIFICALLY MARKED

14. HYDRO-DISK AND MIXER SHAFT MATERIAL TO BE 304L SS
15. SEAL TUBE MATERIAL TO BE A36
16. PLATFORM DETAILS OMITTED FOR CLARITY, SEE DRAWING MT_VERNON-106 FOR MORE INFORMATION.
17. LM MIXER MECHANISM LOCATION(S): DIGESTERS #X, & #X
18. LM MIXER ASSEMBLY LOCATION TAG(S): XXXXX & XXXXX
19. TANK SOLIDS CONCENTRATION < 6%
20. ALL STEEL TO COMPLY WITH THE AMERICAN IRON AND STEEL (AIS) ACT - "BUY AMERICAN CONSTRUCTION MATERIALS", PENNSYLVANIA STEEL PRODUCTS PROCUREMENT ACT, ALL STEEL TO BE USA DOMESTIC STEEL AND ALL STEEL MUST HAVE MILL CERTIFICATES. <DELETE NOTE IF N/A>
21. SPECIAL TOOLS: ONE (1) SHAFT CLAMP, ONE (1) SHAFT LIFTING TOOL, & ONE (1) SET MANUAL CRANK ROTATION TOOLS
22. SPARE PARTS: (TO BE PACKED IN WOODEN BOX FOR LONG TERM STORAGE AND LABELED WITH CONTENTS)
    - TWO (2) LINEAR RAILS
    - FOUR (4) LINEAR SLIDING BLOCKS
    - ONE (1) CAM FOLLOWER ASSEMBLY
    - FOUR (4) AUTO GREASERS

EQUIPMENT WEIGHT AND DYNAMIC LOAD

UNFACTORED EQUIPMENT WEIGHT (APPROX): 6,000 LB
(LM MIXER, MOUNTING TABLE, PORT COVER, SHAFTS, HYDRO-DISK, SEAL TUBE, PLATFORM)

MAX DYNAMIC LOAD (APPROX): 2626 LBF
(FORCE OF 7.5 HP AT 30 RPM AT 6 INCH RADIUS)

DRAWING INDEX

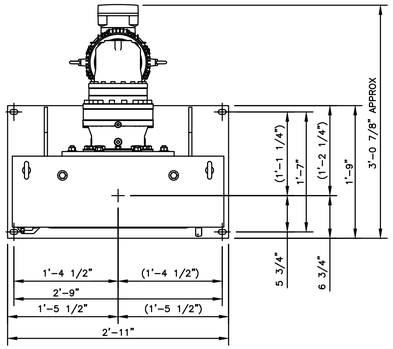
THIS DRAWING IS CERTIFIED FOR:	
CUSTOMER:	
CUSTOMER ORDER NO.:	
OVIVO ORDER NUMBER:	MT_000VERNON-01
PROJECT:	MT VERNON WWTP
PROJECT LOCATION:	MT VERNON, OH
CONSULTING ENGINEER:	
BY: HAYDON CHRISTIANSEN	DATE: 8/18/2020

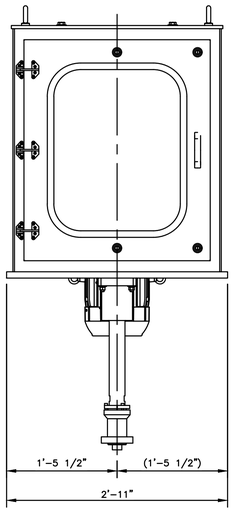
OVIVO
Worldwide Experts in Water Treatment

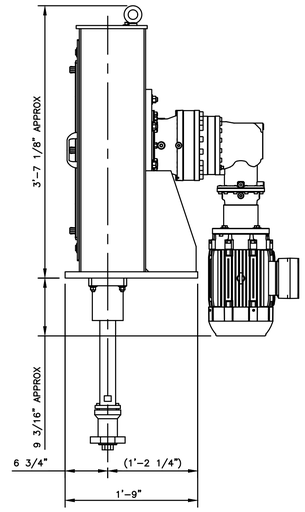
GENERAL ARRANGEMENT
LM12 MIXER / Ø40' TANK
MT VERNON WWTP, MT VERNON, OH

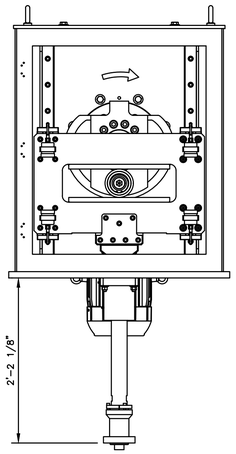
REF. FROM	-	DO NOT SCALE PRINTS
DATE (mm/dd/yyyy)	8/18/2020	WORKMANSHIP STANDARD ES0001 APPLIES

REVISION DESCRIPTION	EN/ECO	BY	CHECK'D	DATE	REV	DRAWN	CHECK'D	DWG. NO.	SHEET	REV
INITIAL RELEASE					A	HCC	SANDRA	MT_VERNON-101	1 OF 1	A
						ORIGINAL S.O.	MT_000VERNON-01			

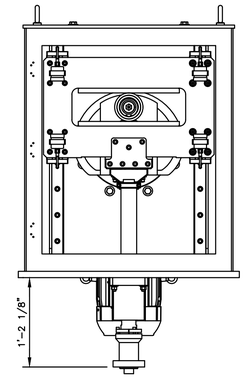




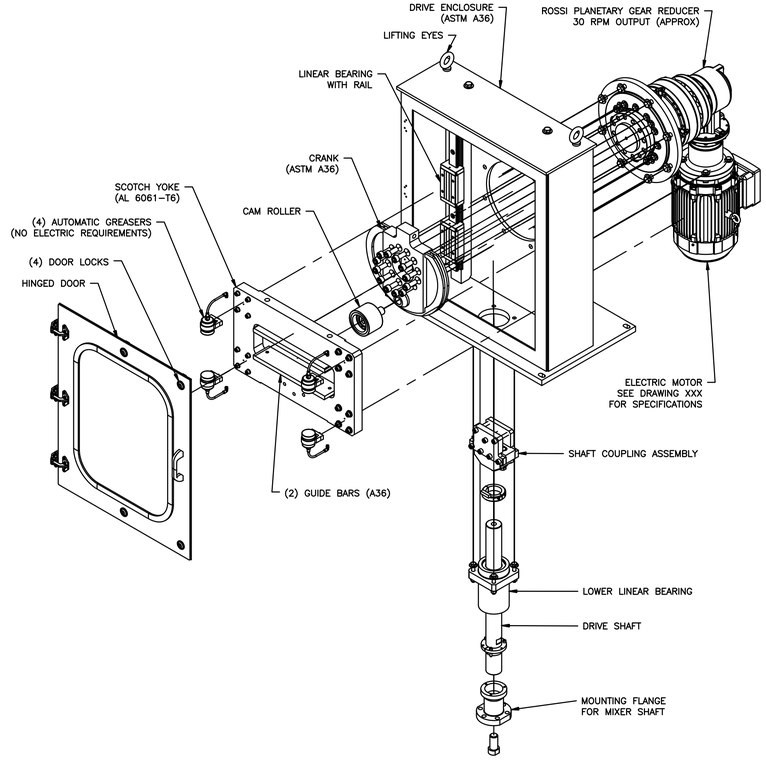




BOTTOM OF STROKE
(DOOR NOT SHOWN)



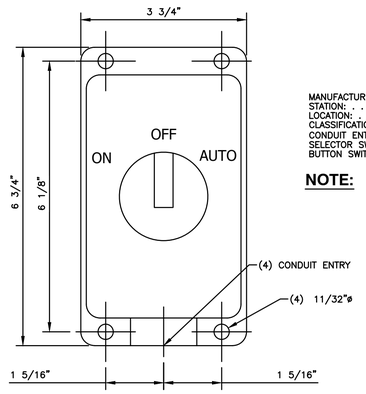
TOP OF STROKE
(DOOR NOT SHOWN)



EXPLODED VIEW
NOT TO SCALE

NOTES:

DRAFT - FOR REVIEW ONLY



SWITCH DETAIL
NOT TO SCALE

MANUFACTURER: . . . . . ALLEN BRADLEY
STATION: . . . . . 800H TYPE 7 & 9 EXPLOSION PROOF
LOCATION: . . . . . HAZARDOUS
CLASSIFICATION: . . . . . CLASSES I, II, & III – DIVISION 1 & 2
CONDUIT ENTRY: . . . . . 3/4 – 14 NPT ■ 1–11 1/2 NPT □
SELECTOR SWITCHES: . . . . . NONE □ HAND □ ON ■ OFF ■ AUTO ■
BUTTON SWITCHES: . . . . . NONE ■ START □ STOP □ RESET □

NOTE:

EQUIPMENT MANUFACTURER:
OVIVO
Worldwide Experts in Water Treatment

REVISION RECORD		
NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DATE:	1/11/21	JBH
DWG SCALE:	AS SHOWN	DRAWN BY: TWA
PROJECT NO:	302-609	CHECKED BY:
APPROVED BY:	MWF	

DRAWING NO.:
SHEET OF

PLATFORM SPECIFICATIONS

PLATFORM FRAME MATERIAL:
A36 ■ ALUMINUM □ HDG □

GRATING THICKNESS & MATERIAL:
1 1/2" ALUMINUM I-BAR □ 1 1/4" ALUMINUM SERRATED I-BAR ■ NOT BY OVIVO □

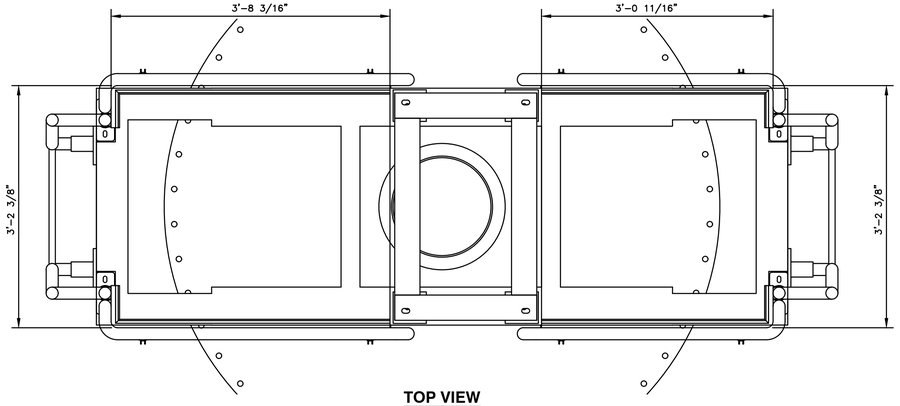
HANDRAIL & POST MATERIAL:
1 1/2" SCH 40 ALUMINUM 6005A COMPONENT STYLE ■ NOT BY OVIVO □

TOE PLATE (ATTACHED TO POSTS):
4" ALUMINUM ■ NOT BY OVIVO □

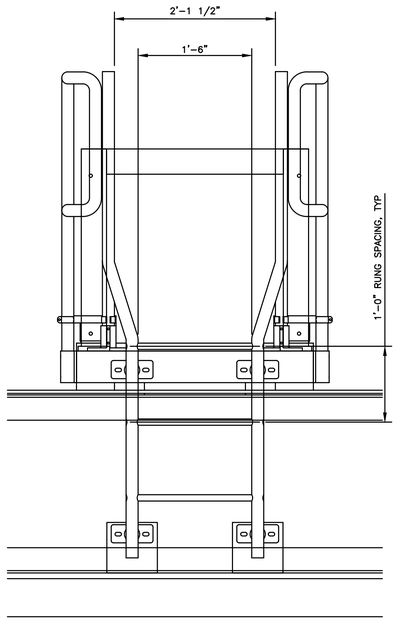
LADDER W/ WALK-THRU:
304L SS □ 316L SS □ 1 1/2" SCH 40 ALUMINUM ■ N/A □

STAIR STRINGER MATERIAL:
A36 □ ALUMINUM □ HDG □ N/A ■

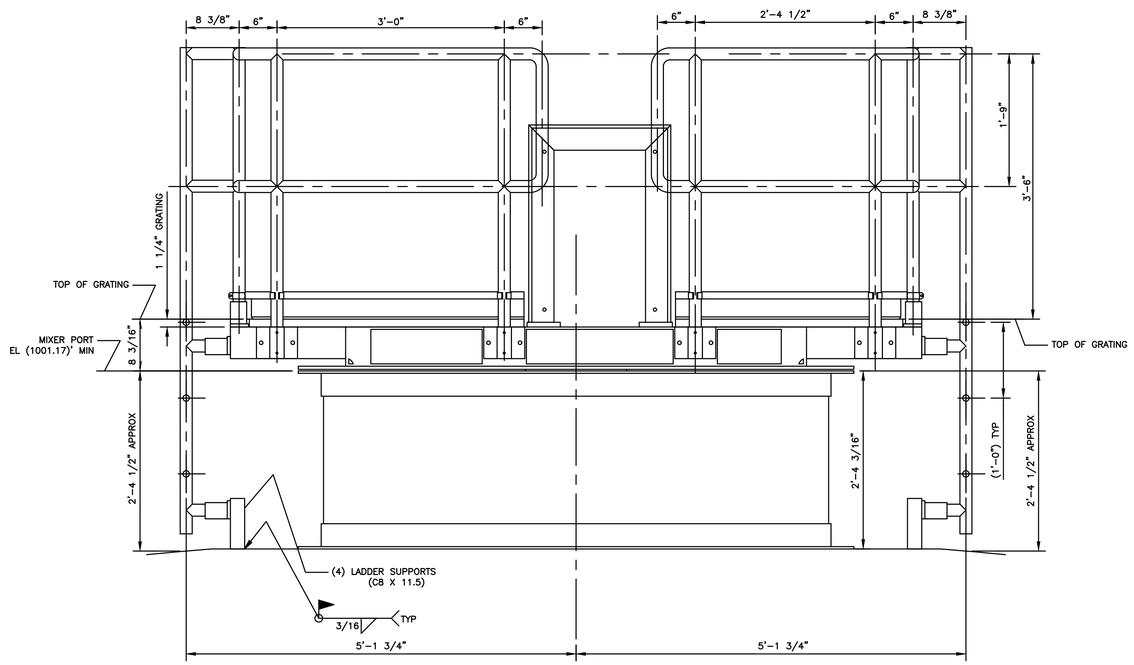
STAIR TREAD GRATING MATERIAL:
A36 □ ALUMINUM □ HDG □ N/A ■



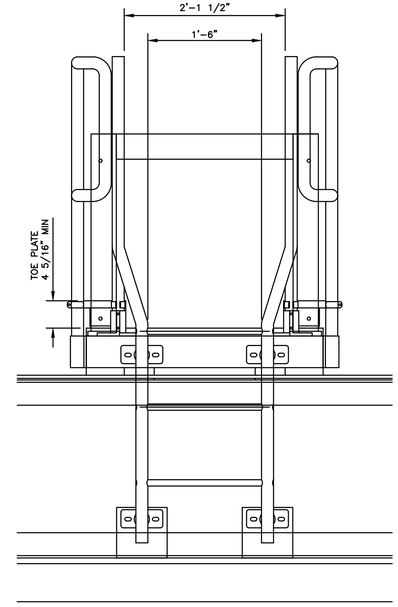
TOP VIEW
NOT TO SCALE



FRONT VIEW
NOT TO SCALE



SIDE VIEW
NOT TO SCALE



REAR VIEW
NOT TO SCALE

NOTES:

DRAFT - FOR REVIEW ONLY

EQUIPMENT MANUFACTURER:
OVIVO
Worldwide Experts in Water Treatment

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER
TREATMENT PLANT
IMPROVEMENTS

DATE:	1/11/21
DWG SCALE:	AS SHOWN
PROJECT NO:	302-609
DRAWN BY:	JBH
CHECKED BY:	TWA
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF

P:\300-0001\302-6091-0401\Dwg\CIVIL\302609-CV01-A-STRUCTURE IMPS.dwg|AEROBIC TANK DETAIL 4| LS|1/11/2021 - jhollis| - LP, 1/12/2021 1:43 PM

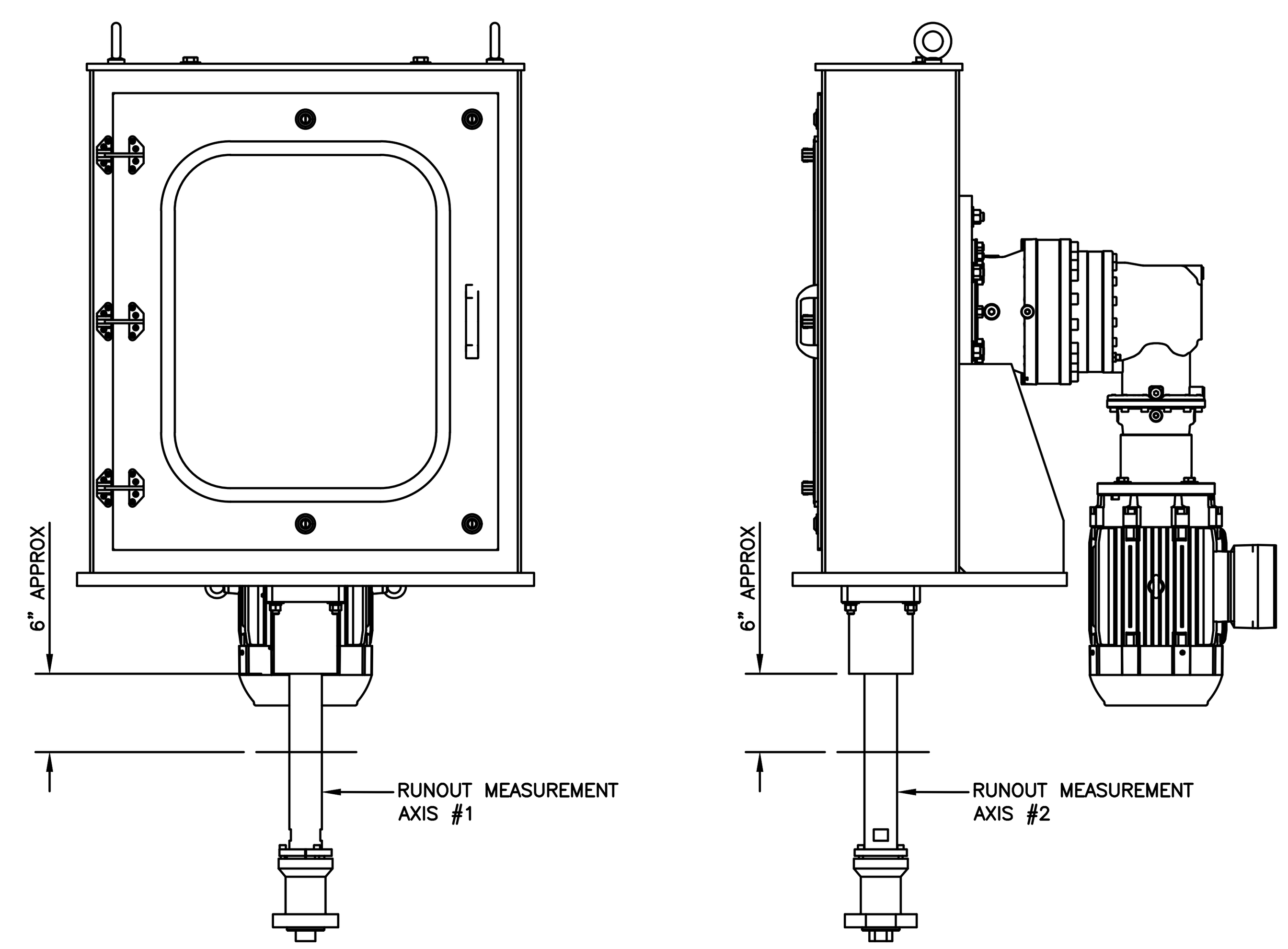
TEST PROCEDURES:

1. ORIENT THE LM™ MIXER SO THAT THE OUTPUT SHAFT IS VERTICAL. CHECK TO MAKE SURE THAT ADEQUATE CLEARANCE EXISTS BELOW THE SHAFT AT FULL EXTENSION BEFORE POWERED OPERATION.
2. LUBRICATE THE MOTOR WITH GREASE PER MOTOR MANUFACTURERS RECOMMENDATIONS.
3. CHECK THE REDUCER (GEAR BOX) FOR PROPER LUBRICATION, FILL OR TOP OFF IF NECESSARY PER THE MANUFACTURERS RECOMMENDATIONS.
4. GREASE THE MIXER AT ALL FIVE (5) PORTS USING AFB–LF LITHIUM BASED GREASE.
5. SUPPLY APPROPRIATE POWER TO THE MIXER MOTOR.
6. CHECK AND RECORD THE OUTPUT SHAFT RUNOUT PER DETAIL "A", MAXIMUM SHAFT RUNOUT SHALL NOT EXCEED .005" AS MEASURED ON A DIAL INDICATOR. THE MIXER MUST BE MANUALLY ACTUATED BY TURNING THE MOTOR FAN TO PERFORM THIS TEST. MEASUREMENTS SHALL BE RECORDED AT 90° FROM EACH OTHER.
7. START THE LM? MIXER AND ALLOW TO RUN FOR 2 HOURS, DURING THIS TIME THE FOLOWING CONDITIONS SHALL BE MONITORED AND RECORDED EVERY 30 MINUTES:
   a) LOWER BEARING HOUSING TEMPERATURE AT MID–POINT (150 DEGREES F. MAX ALLOWABLE)
   b) LINEAR RAIL BLOCK (4 TOTAL) TEMPERATURE (150 DEGREES F. MAX ALLOWABLE)
   c) GEAR REDUCER TEMPERATURE (LIMITED BY LUBRICANT TYPE)
      1. MINERAL – 185°F MAXIMUM
      2. SYNTHETIC – 220°F MAXIMUM

   DISCONTINUE TEST IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:
   – MAXIMUM ALLOWABLE TEMPERATURE IS REACHED BY ANY COMPONENT
   – UNUSUAL NOISE FROM MOTOR, GEARBOX, OR BEARINGS

   ATTEMPT TO DETERMINE THE ROOT CAUSE OF THE PROBLEM AND CONTACT OVIVO REPRSENTATIVE(S) FOR FURTHER ACTION.
8. AT THE CONCLUSION OF THE TEST PERIOD INSPECT THE MIXER FOR ANY SIGNS OF UNUSUAL WEAR ON BEARINGS OR WEAR SURFACES. THESE SURFACES INCLUDE:
   a) LINEAR BEARING RAILS
   b) WEAR PLATES OR HARDENED GUIDE BARS
   c) MIXER OUTPUT SHAFT

   *REPORT ANY UNUSUAL WEAR TO OVIVO REPRESENTATIVE(S)
9. SUBMIT COMPLETED TEST REPORT TO OVIVO FOR EACH MIXER PRIOR TO SHIPMENT.



DETAIL "A"
NOT TO SCALE

RECORDED PARAMETERS

CONDITION	RUNNING TIME START TEMP.	30 MIN.	60 MIN.	90 MIN.	120 MIN.
LOWER BEARING TEMP [F]					
LINEAR BLOCK (TOP LEFT) TEMP. [F]					
LINEAR BLOCK (TOP RIGHT) TEMP. [F]					
LINEAR BLOCK (BOTTOM LEFT) TEMP. [F]					
LINEAR BLOCK (BOTTOM RIGHT) TEMP. [F]					
GEAR REDUCER TEMP. [F]					

RUNOUT MEASUREMENTS CONDITION	AXIS #1	AXIS #2
SHAFT RUNOUT [IN]		

TEST PERFORMED BY:______________________ DATE:______________
START DATE:______________ MIXER S/N:______________________

SEND COMPLETED TEST REPORT TO CONTRACT BUYER.
OVIVO USA, PHONE: (801) 931–3000

DRAFT - FOR REVIEW ONLY

EQUIPMENT MANUFACTURER:
OVIVO
Worldwide Experts in Water Treatment

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

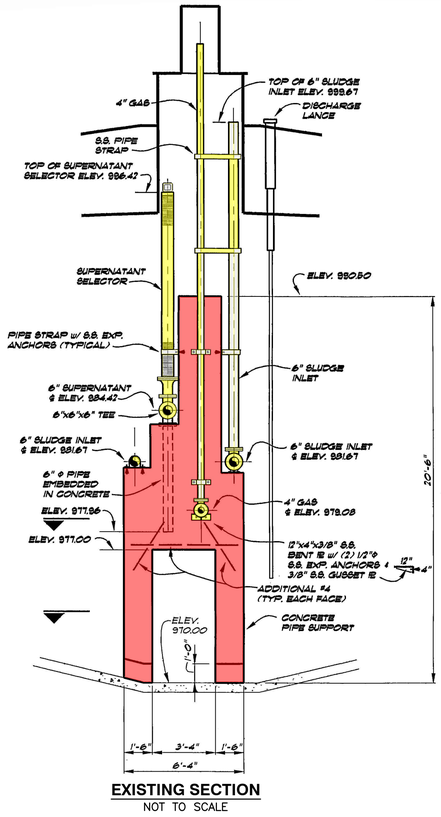
CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DATE:	1/11/21	DRAWN BY:	JBH
DWG SCALE:	AS SHOWN	CHECKED BY:	TWA
PROJECT NO:	302-609	APPROVED BY:	MWF

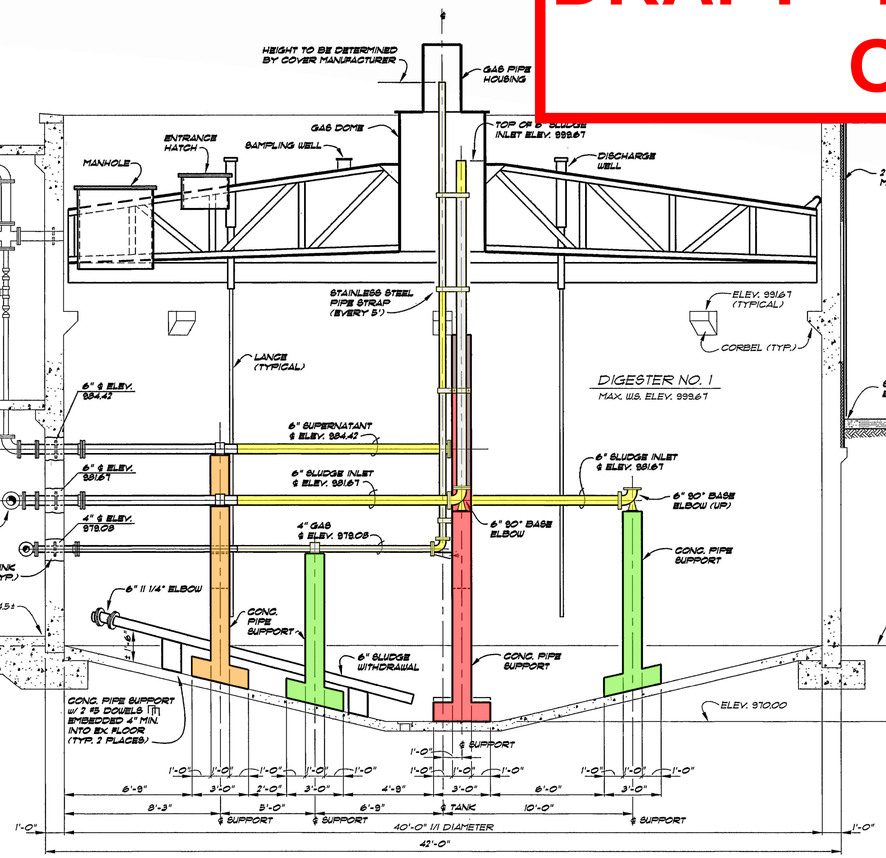
DRAWING NO.:

SHEET OF

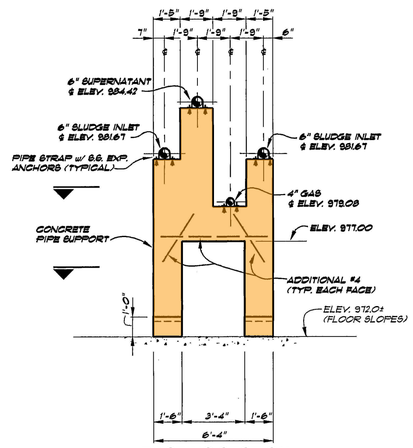
DRAFT - FOR REVIEW ONLY



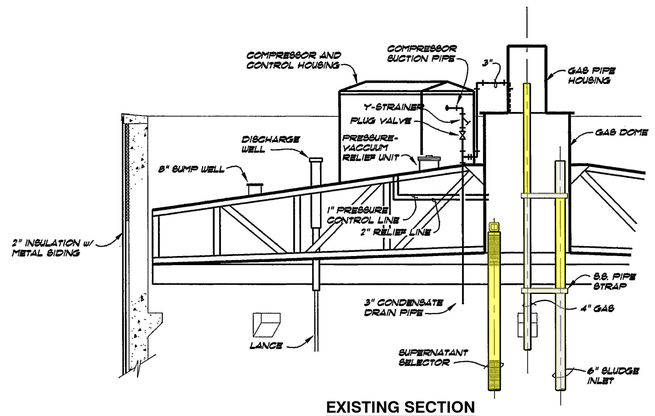
EXISTING SECTION
NOT TO SCALE



EXISTING SECTION
NOT TO SCALE



EXISTING SECTION
NOT TO SCALE



EXISTING SECTION
NOT TO SCALE

LEGEND

- CONCRETE SUPPORT TO BE REMOVED
- PIPING SECTIONS TO BE RELOCATED OR REMOVED
- CONCRETE SUPPORTS THAT SHOULD BE REMOVED BECAUSE WOULD BE UNESED
- CONCRETE SUPPORTS CAN STAY BUT PREFERABLE TO REMOVE ALSO DEPENDING ON PIPING RELOCATIONS

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DATE:	1/11/21
DWG SCALE:	AS SHOWN
PROJECT NO:	302-609
DRAWN BY:	JBH
CHECKED BY:	TWA
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF

HEAT EXCHANGER MODIFICATIONS

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Heat Exchanger Replacement - Water to Sludge					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
Process Piping Modifications (Valves & Piping)	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
New Ovivo 0.76 DDI Heat Exchanger	2	**EA**	$ 110,000.00	**$/EA**	$ 220,000.00
New Heat Exchanger Base (min. 6" High)	3	**CY**	$ 1,300.00	**$/CY**	$ 3,900.00
Installation Cost of New Heat Exchangers	1	**LS**	$ 66,000.00	**$/LS**	$ 66,000.00
Sub-Total					**$ 319,900.00**

SUBTOTAL	**$**	**319,900.00**
Contingency (10%)	$	32,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**351,900.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**106,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**457,900.00**
SAY	**$**	**458,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Estimated O&M (Cleaning, Replacement Parts Etc)	$	13,000.00
Estimated Heating Costs (Boiler Power/Gas)	$	5,000.00
Sub-Total	**$**	**18,000.00**

Total Yearly O&M Costs	$		18,000.00
Discount Rate (I = 2%)		0.02	
Planning Period (n = Life Expectancy)		20	
Total Capital Cost	$		458,000.00
Annual O&M Cost	$		18,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718	
Equilavlent Annual Operating Cost (EAOC)	$		47,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02	
Planning Period (n = Life Expectancy)		20	
Total Capital Cost	$		458,000.00
Annual O&M Cost	$		18,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334	
Present Worth of Annual O&M Cost	$		294,325.80
Net Present Value	$		752,325.80

NPV = Total Capital Cost + Present Worth of Annual O&M

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Heat Exchanger Water to Sludge & Sludge to Sludge					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
Process Piping Modifications (Valves & Piping)	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
New Ovivo 0.76 DDI Water To Sludge Heat Exchanger	2	**EA**	$ 110,000.00	**$/EA**	$ 220,000.00
New Ovivo 0.267 DDI Sludge to Sludge Heat Exchanger	2	**EA**	$ 130,000.00	**$/EA**	$ 260,000.00
New Heat Exchanger Base (min. 6" High)	4	**CY**	$ 1,300.00	**$/CY**	$ 5,200.00
Installation Cost of New Heat Exchangers	1	**LS**	$ 105,000.00	**$/LS**	$ 105,000.00
Sub-Total					**$ 620,200.00**

SUBTOTAL	**$**	**620,200.00**
Contingency (10%)	$	62,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**682,200.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**205,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**887,200.00**
SAY	**$**	**888,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY		Yearly Operations Cost
Estimated O&M (Cleaning, Replacement Parts Etc)	$	24,000.00
Estimated Heating Costs (Boiler Power/Gas)	$	3,000.00
Sub-Total	**$**	**27,000.00**

Total Yearly O&M Costs	$		27,000.00
Discount Rate (I = 2%)		0.02	
Planning Period (n = Life Expectancy)		20	
Total Capital Cost	$		888,000.00
Annual O&M Cost	$		27,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)		0.061156718	
Equilavlent Annual Operating Cost (EAOC)	$		82,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)		0.02	
Planning Period (n = Life Expectancy)		20	
Total Capital Cost	$		888,000.00
Annual O&M Cost	$		27,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)		16.35143334	
Present Worth of Annual O&M Cost	$		441,488.70
Net Present Value	$		1,329,488.70

NPV = Total Capital Cost + Present Worth of Annual O&M

OVIVO Worldwide Experts in Water Treatment

BUDGETARY PROPOSAL

FEBRUARY 8, 2021

MOUNT VERNON WWTP

MOUNT VERNON, OH

Anaerobic Digestion Equipment

PREPARED FOR

MOUNT VERNON WWTP, OH

AREA REPRESENTATIVE

Nichols Environmental
Ed Nichols
Ed.Nichols@nicholsenv.com

PREPARED BY

Sandra Angarita
c/o Bryen Woo
Phone: (801) 931-3000
Bryen.Woo@ovivowater.com

Ovivo USA, LLC
4246 Riverboat Road – Suite 300
Salt Lake City, Utah 84123-2583
http://www.ovivowater.com

COST SUMMARY[1]

Rectangular Water/Sludge Heat Exchanger

OPTION 1 One (1) Rectangular Water/Sludge Heat Exchanger (0.76 DDI)	**$120,000**
OPTION 2 Two (2) Rectangular Water/Sludge Heat Exchanger (0.76 DDI)	**$220,000**
ADDER A Option to change the Material of Construction to 304SS for Item I	**$11,000**
ADDER B Option to change the Material of Construction to 304SS for Item II	**$22,000**

[1] *All prices in US Dollars.*

Rectangular Sludge/Sludge Heat Exchanger

OPTION 1 One (1) Rectangular Sludge/Sludge Heat Exchanger (0.267 DDI)	**$140,000**
OPTION 2 Two (2) Rectangular Sludge/Sludge Heat Exchanger (0.267 DDI)	**$253,000**

[1] *All prices in US Dollars.*

PRODUCT HIGHLIGHTS

HEAT EXCHANGERS

Ovivo proposes the rectangular tube design. This design allows for higher percent solids and no plugging. In addition, the footprint of the unit is significantly less as there is no need to have wasted space for removing any tubes (with the tube-in-tube design). Please see the attached brochure for additional details.

WATER/SLUDGE HEAT EXCHANGER - TECHNICAL DATA

Water/Sludge Heat Exchanger	**Carbon Steel**	**304 SS**
Model	**0.76 DDI**	**0.76 DDI**
Size	760,000 BTU/H	760,000 BTU/H

Sludge:		
Flow	125 gpm	125 gpm
Temperature In	95.0 °F	95.0 °F
Temperature Out	106.7 °F	106.7 °F
Pressure Drop	8.5 psi	8.7 psi
Viscosity	4.0 cp	4.0 cp
Water:		
Flow	60 gpm	60 gpm
Temperature In	155 °F	155 °F
Temperature Out	129 °F	129 °F
Pressure Drop	3.5 psi	3.7 psi
Viscosity	0.5 cp	0.5 cp
Heat Transfer Area	159.5 ft^2	175.5 ft^2
Length (approx.)	6.46 ft	6.96 ft
Width (approx.)	3.74 ft	3.74 ft
Height (approx.)	3.92 ft	3.92 ft
Wall Thickness	0.25 in	0.25 in
Number of Layers	Twelve (12)	Twelve (12)
Number of Channels per layer	Six (6)	Six (6)
Number of Nozzles	Four (4)	Four (4)
Channel Material of Construction	**Mild Steel**	**304 Stainless Steel**
Frame Material of Construction	Mild Steel	Mild Steel
Approximate Total Weight	6,100 lbs	7,100 lbs

SLUDGE/SLUDGE HEAT EXCHANGER - TECHNICAL DATA

Sludge/Sludge Heat Exchanger	**Carbon Steel**
Model	**0.267 DDI**
Size	267,000 BTU/H
Cold Sludge:	
Flow	150 gpm
Temperature In	70 °F
Temperature Out	73.4 °F
Pressure Drop	19 psi
Viscosity	4.0 cp
Hot Sludge:	
Flow	150 gpm
Temperature In	95 °F
Temperature Out	91.5 °F
Pressure Drop	15 psi
Viscosity	4.0 cp
Heat Transfer Area	159.5 ft^2

Length (approx.)	6.00 ft
Width (approx.)	5.00 ft
Height (approx.)	4.20 ft
Wall Thickness	0.25 in
Number of Layers	Twelve (12)
Number of Channels per layer	Six (6)
Number of Nozzles	Four (4)
Channel Material of Construction	**Mild Steel**
Frame Material of Construction	Mild Steel
Approximate Total Weight	8,000 lbs

Please note the following:

- Static head & losses in external piping are not included in calculations and estimate.
- Hydrostatic test pressure is pressure rated 1.3x per ASME Code.

SCOPE OF SUPPLY

Items Included
Heat Exchanger with: - Channels - Frame
One (1) Year Warranty
Service as noted in the "Field Service" segment
Operation and Maintenance manuals
FCA Factory, Freight allowed to the jobsite
Items Not Included
Boiler or any other relate equipment unless specifically listed above
Pressure & temperature gauges
Flow measurement equipment
Safety valves (PRV's)
Instrumentation and Controls of any kind
Spare parts
Pumps, piping, fittings, tubing and pipe supports
Fasteners and/or gaskets for inlet/outlet flanges
Finish or field touch-up paint
Foundation
Unloading, storage, installation
Field and laboratory testing
Taxes, duties, fees
Any items not specifically listed in the "Items Included" table

ADDITIONAL INFORMATION

FIELD SERVICE

Ovivo's scope includes the service of a qualified service engineer for the following:

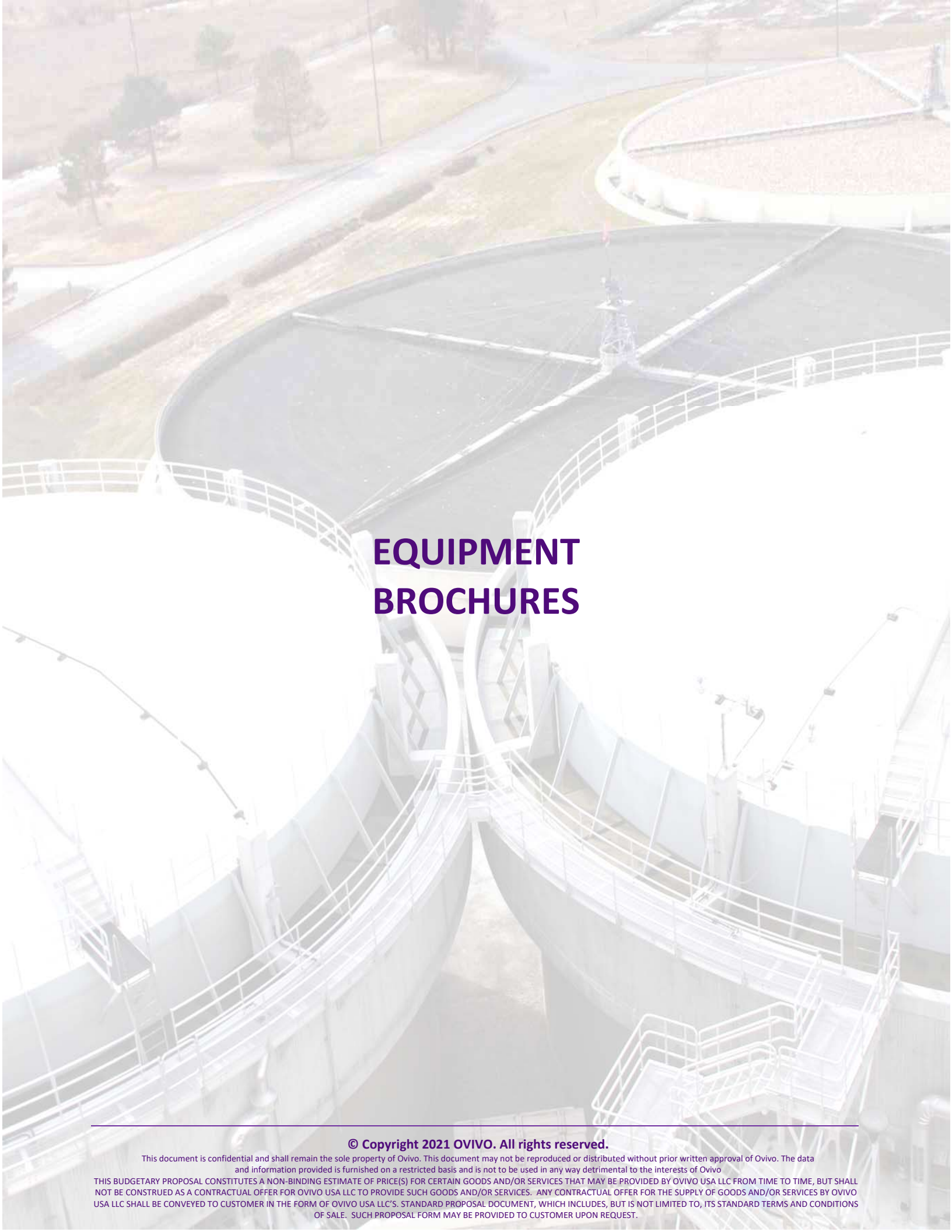
One (1) trip of two (2) days total, per heat exchanger, of service at the site for the supervision of equipment start-up, testing supervision, and instructing the operators.

Additional service days can be purchased at the current rate.

ESTIMATED LEAD TIMES

Submittals: Eight (8) weeks after Purchaser's receipt of Ovivo's written acknowledgement of an approved purchase order.

Shipping: Twenty-four (24) weeks after receipt of approved drawings from Purchaser.



EQUIPMENT BROCHURES

Rectangular Heat Exchanger

Cost-Effective Heat Recovery

What are your needs?

- Simple installation, operation and maintenance
- Reliable and efficient heat recovery system
- Water to sludge heat exchange or heat recovery from waste sludge

Key Benefits

- Reduced maintenance and long continuous service periods
- Unique, non-pluggable design, with large heat transfer surface
- Rectangular channels for smaller footprint

ovivowater.com

OVIVO®
Bringing water to life®

Rectangular Heat Exchanger

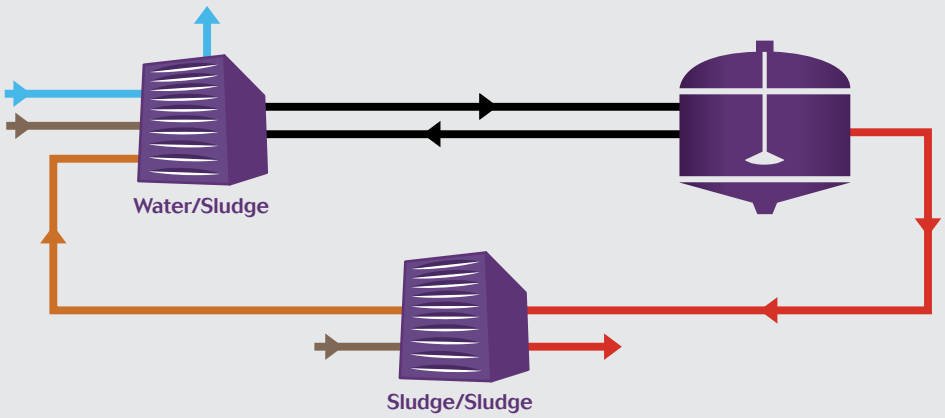
Heat Exchanger and Heat Recovery Systems

- Rectangular channels with compact size and fast flow via width control.
- Improved heat transfer efficiency with high turbulent flow in both sides.
- Easy maintenance. Recommended only once every five years for most municipal applications.
- Lower risk of baking.

Standard design:

- Sludge to Sludge or Water to Sludge applications
- Sludge side gap: 3 to 6 in channel
- Water side gap: 1 to 6 in channel

Anaerobic Digestion Heat Recovery From Digestion Sludge



Water/Sludge Heat Exchanger
Raw sludge
Recirculation line
Water

Sludge/Sludge Heat Exchanger
Raw sludge
Hot sludge before dewatering
Raw sludge circulation to the second heat exchanger to reach the required temperature by hot water

For more information on this product contact us at:

1-855-GO-OVIVO
www.ovivowater.com

DDI-ECPS-(Sludge- 2" [50mm] high x 6" [152.4 mm] wide)
(Water - 1.5" [38.10 mm]high x 6" [152.4 mm] wide) x
5.16' ft (1574.8 mm) Lenght x 3' (914.4 mm) ft wide x
6 - Channels x 11HT - Layers x
6 mm (or 0.25") Material - 60 psi - 3 x 6L =
18 (ECPS) Cleaning Ports - 6" Dia. S. 4" Dia. W.
1 Circuit, 4 Nozzles Total.
1 HEAT EXCHANGERS IN 1 FRAME
HEAT TRANSFER LAYERS +1 SHOW HERE AS N=12

NOTES:

1) THE UNIT WILL BE MANUFACTURED AT AN ASME -REGISTERED FACILITY 'MPGIA, SA de CV (MEXICO)'

2) FOR ANCHORING TO THE GROUND, SUPPLIED BY THE CUSTOMER.

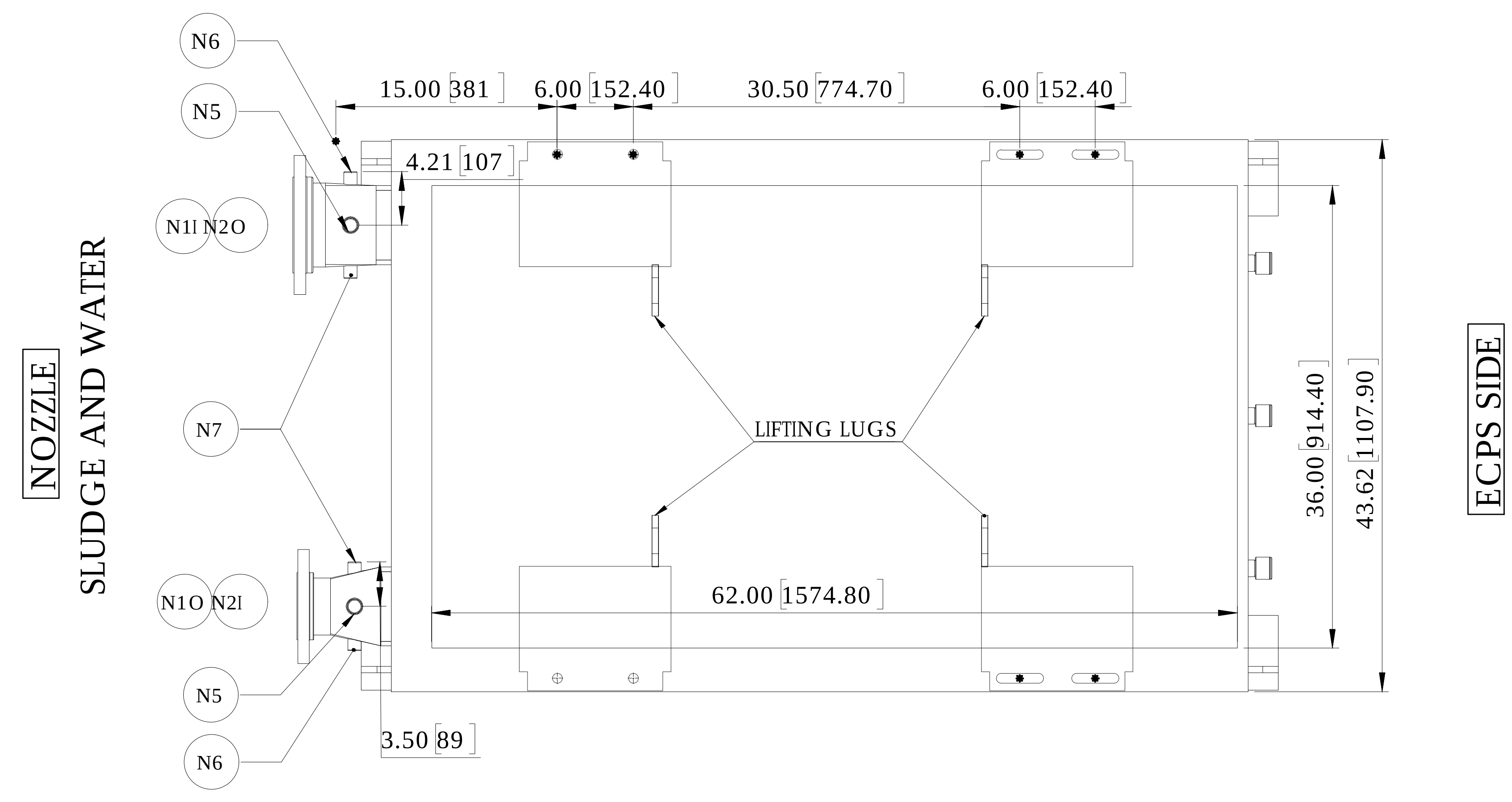
3) ECPS- "EASY CLEANING PORTS SYSTEM™".

4) NEED FREE SPACE OF MINIMUM, 1 METER FOR CLEANING NEAR ECPS

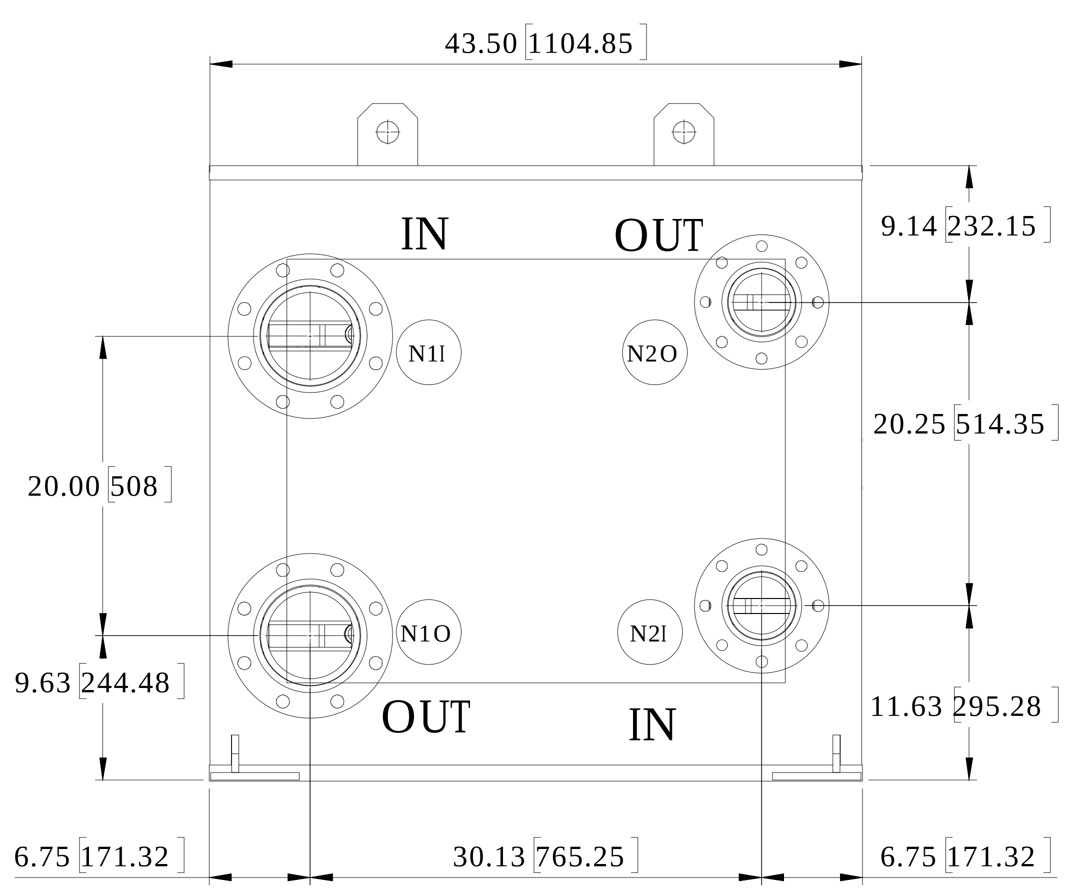
MATERIAL SPECIFICATIONS			
HEADS (COVER):	---	NOZZLE NECK:	SA-516-70/SA-106-B
SHELL:	SA-516 Gr.70	COUPLINGS:	SA-105
BAFFLE:	SA-516 Gr.70	BOLTS OR STUDS: 12 MM ø OR MORE.	SA-193 B7 ZINC PLATED
REINF. PAD:	N/A	HEAVY HEXAGONAL NUTS:	SA-194 2H ZINC PLATED
SUPPORT:	SA-36	CHANNEL, ISMC	IS: 808-1989 OR SA-36
FLANGES:	SA-105		
CLADDING:	GALVANIZED METAL OR PAINTED SHEET		
INSULATION:	75 MM THICK MINERAL WOOL ENCLOSED UNDER THE CLADDING		

DESIGN DATA	
	SHELL SIDE
DESIGN CODE: ASME SECT. VIII DIV.1, ED. 2019	
ASME MARK DESIGNATOR U / NB REGISTER	YES / YES
MATERIAL CODE: ASME SECT. IIA MATERIALS, ED. 2017	
DESIGN PRESSURE (DIFFERENTIAL):	60 psig (4.2 kg/cm2)
MAWP INTERNAL	60 psig (4.2 kg/cm2)
MAWP EXTERNAL	N/A
MDMT	-20°F TO +330°F AT 60 PSI FOR SLUDGE AND WATER
DESIGN TEMPERATURE:	330°F (165.55°C)
CORROSION ALLOWANCE (HT PLATES)	---
CORROSION ALLOWANCE (ELSE WHERE)	---
HYDROTEST PRESSURE (Sludge Side):	80 psig
HYDROTEST PRESSURE (Water Side):	80 psig
PWHT:	NONE
IMPACT TEST:	---
FLUIDS: WATER & SLUDGE	---
FLUID SPECIFIC GRAVITY:	---
CONNECTIONS WATER SIDE:	NPS 4
CONNECTIONS SLUDGE SIDE:	NPS 6
WEIGHT NEW EMPTY: ***** Kg. APPROX.	FULL OF WATER: **** Kg. APPROX.
SHIPPING WEIGHT: ***** Kg. + **** Kg. APPROXIMATED.	
WIND CODE: NONE (INDOOR INSTALLATION)	
SEISMIC CODE: WORSE CASE ASSUMED.	
LETHAL SERVICE: NO	CODE CASE: N/A
FURTHER MATERIAL TESTING REQUIRED AT RECEIVING OR DURING FABRICATION.	
INSPECTION BY: CUSTOMER, MPGIA, REGISTRATION VANCOUVER.	

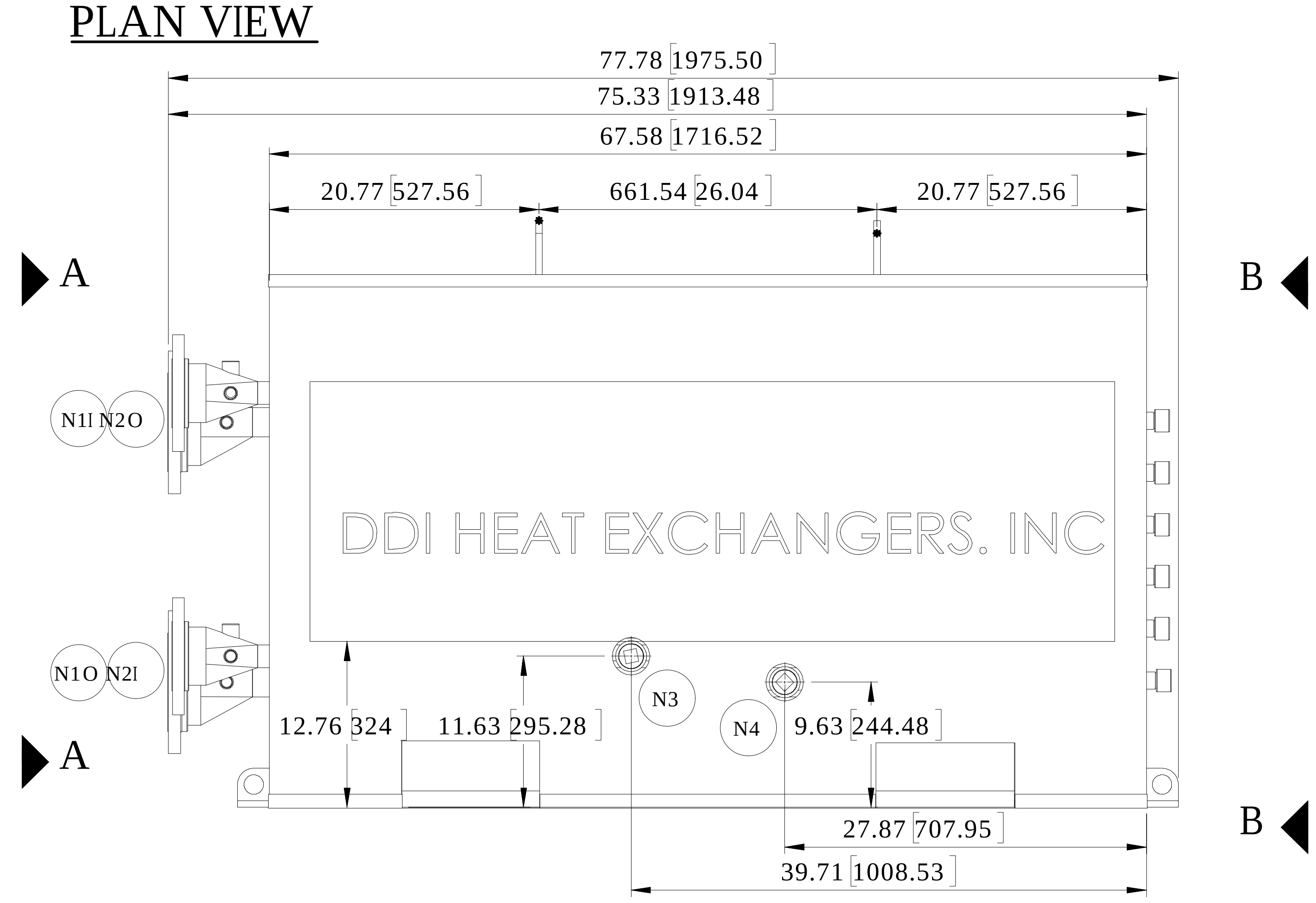
CONNECTIONS							
ITEM	QTY	DN (NPS)	CLASS	FACE	SCH	SERVICE	REMARKS
N1O	1	150 (6)	150	R.F.	80	SLUDGE OUTLET	---
N1I	1	150 (6)	150	R.F.	80	SLUDGE INLET	---
N2O	1	100 (4)	150	R.F.	80	WATER OUTLET	---
N2I	1	100 (4)	150	R.F.	80	WATER INLET	---
N3	1	50 (2)	3000	NPT	---	WATER LIQUID DRAIN	HALF-COUPLING WITH
N4	1	50 (2)	3000	NPT	---	SLUDGE LIQUID DRAIN	ISOLATION VALVE(OPTIONAL)
N5	4	25 (1)	3000	NPT	---	NOZZLE ACCESS	HALF-COUPLING
N6	4	20 (3/4)	3000	(F)NPT	---	NOZZLE PRESSURE PORT	HALF-COUPLING
N7	4	20 (3/4)	3000	(F)NPT	---	NOZZLE TEMPERATURE PORT	HALF-COUPLING
N8	18	25 (1)	---	NPT	160	CLEANING PORT	ECPS



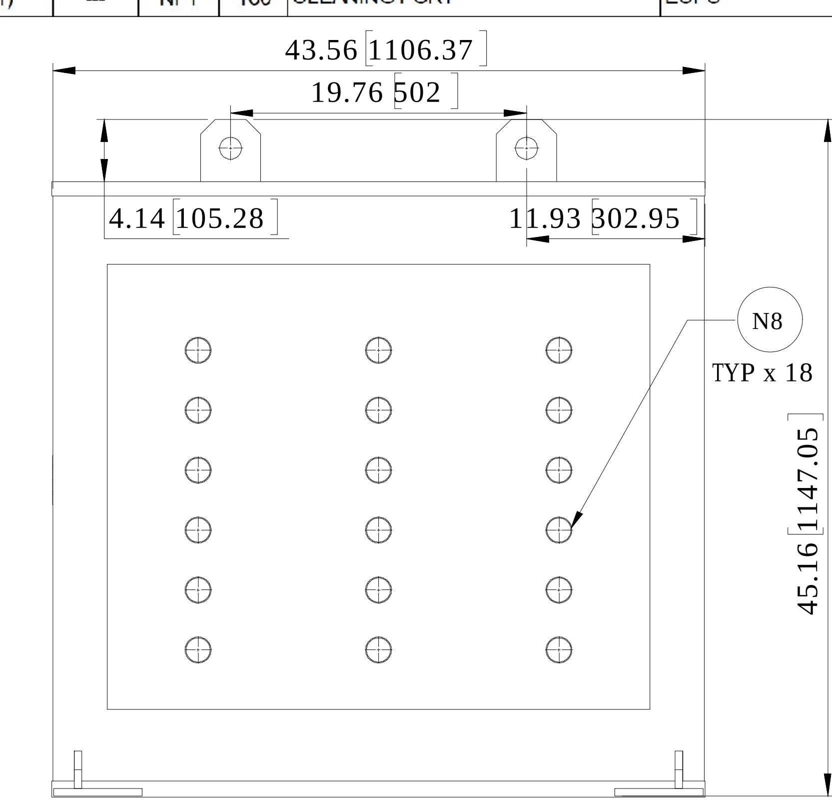
PLAN VIEW



SIDE VIEW A-A



ELEVATION



SIDE VIEW B-B

DRAFT - FOR REVIEW ONLY

C SIZE SHEET (DO NOT SCALE PRINTS)	THIRD ANGLE PROJECTION
DRAWN BY	KLGP
CHECKED BY	HMMP
DATE(mm/dd/yyyy)	01/27/2021
PROJECT	MOUNT VERON, OH
REF	-

SLUDGE HEATER HEAT EXCHANGER
"RECTANGULAR, CUBE, SQUARE" TM
GENERAL ARRANGEMENT

OVIVO

'D | DATE --/-- | A

WORKMANSHIP STANDARD ES0001 APPLIES

DWG NO. **GA-20XX**

SHEET 1 OF 1

REVISION **A**

DRAFT - FOR REVIEW ONLY

EXISTING ELECTRICAL ROOM

EXISTING HEAT EXCHANGER #1

EXISTING HEAT EXCHANGER #2

EXISTING DIGESTER #2

EXISTING DIGESTER #1

EXISTING VENTILATING EQUIPMENT

EXISTING CONTROL ROOM

PROPOSED 6" D.I. 90° BEND (FJ)

1'-0"

2'-6 3/16" (REF.)

4'-9 5/8" (REF.)

PROPOSED HUBER STRAINPRESS 290

4'-4 5/16" (REF.)

PROPOSED 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

REMOVE AND ADJUST EXISTING 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

3'-0 3/8"

PROPOSED 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BENDS (FJ)

PROPOSED 6" PLUG VALVE (FJ)

6" D.I.

14'-5 5/16"

17'-1 5/16"

PROPOSED 6" PLUG VALVE (FJ) (FOR BY-PASS USE)

PROPOSED 6" D.I. 90° BEND (FJ)

PROPOSED 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

REMOVE AND ADJUST EXISTING 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

PROPOSED 6" PLUG VALVE (FJ)

PROPOSED 6" D.I. 90° SIDE OUTLET BEND (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

6" D.I.

PROPOSED 6" PLUG VALVE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

PROPOSED 6" PLUG VALVE (FJ) (BY-PASS VALVE)

REMOVE AND ADJUST EXISTING 6" D.I. 90° BEND (FJ)

5'-3"

4'-1 3/8"

12'-3 3/8"

3'-6 1/4"

PROPOSED 6" D.I. 90° BEND (FJ)

PROPOSED 6"x6"x6" D.I. TEE (FJ)

PROPOSED 6" D.I. 90° BEND (FJ)

PROPOSED 6" PLUG VALVE (FJ) (FOR BY-PASS USE)

REMOVE AND ADJUST EXISTING 6" D.I. 90° BEND (FJ)

PROPOSED 6"x6"x6" D.I. TEE (FJ)

PROPOSED HEAT EXCHANGER

5'-0"

4'-11 11/16"

OVERALL PROPOSED IMPROVEMENTS PLAN VIEW

SCALE: 1/2" = 1 FOOT

REVISION RECORD

NO	DATE	DESCRIPTION

CEC

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

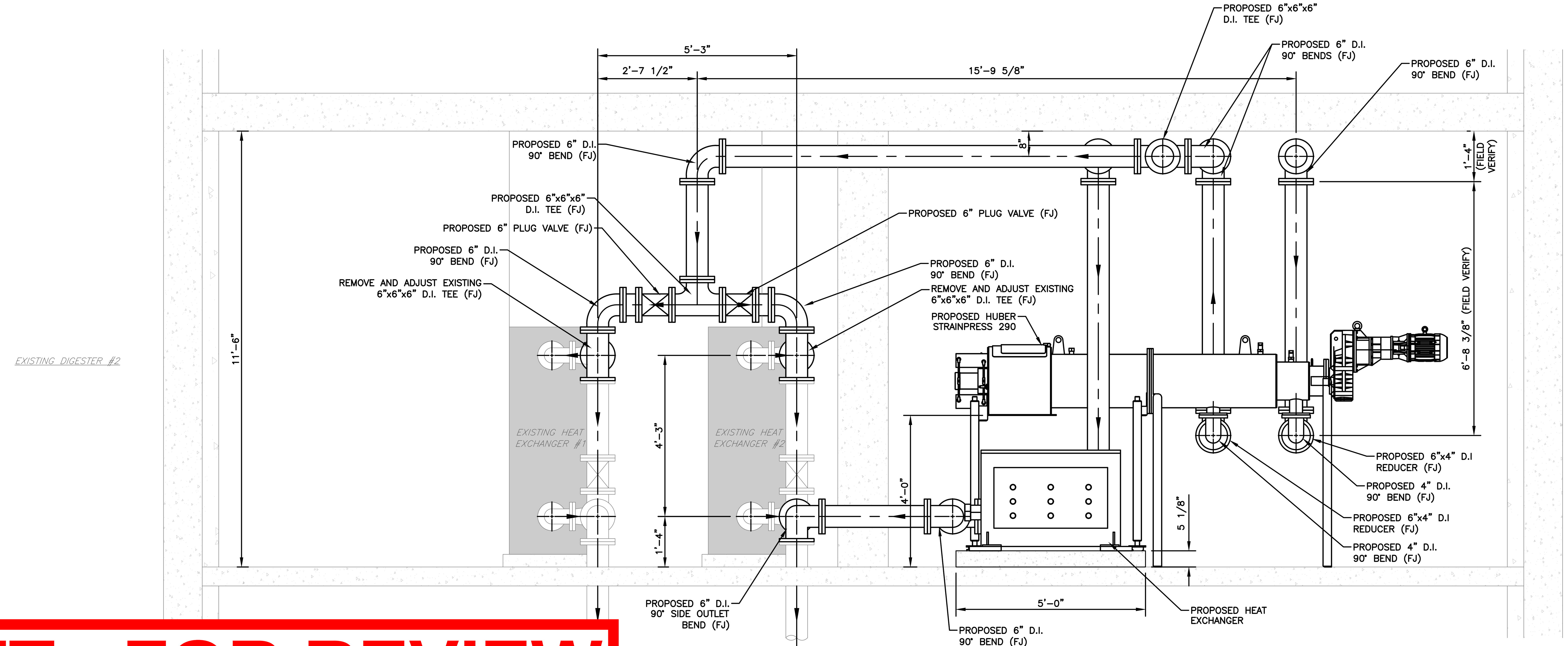
CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT
IMPROVEMENTS

DRAWN BY:	JBH
DATE:	1/11/21
CHECKED BY:	TWA
DWG SCALE:	AS SHOWN
PROJECT NO:	302-609
APPROVED BY:	MWF

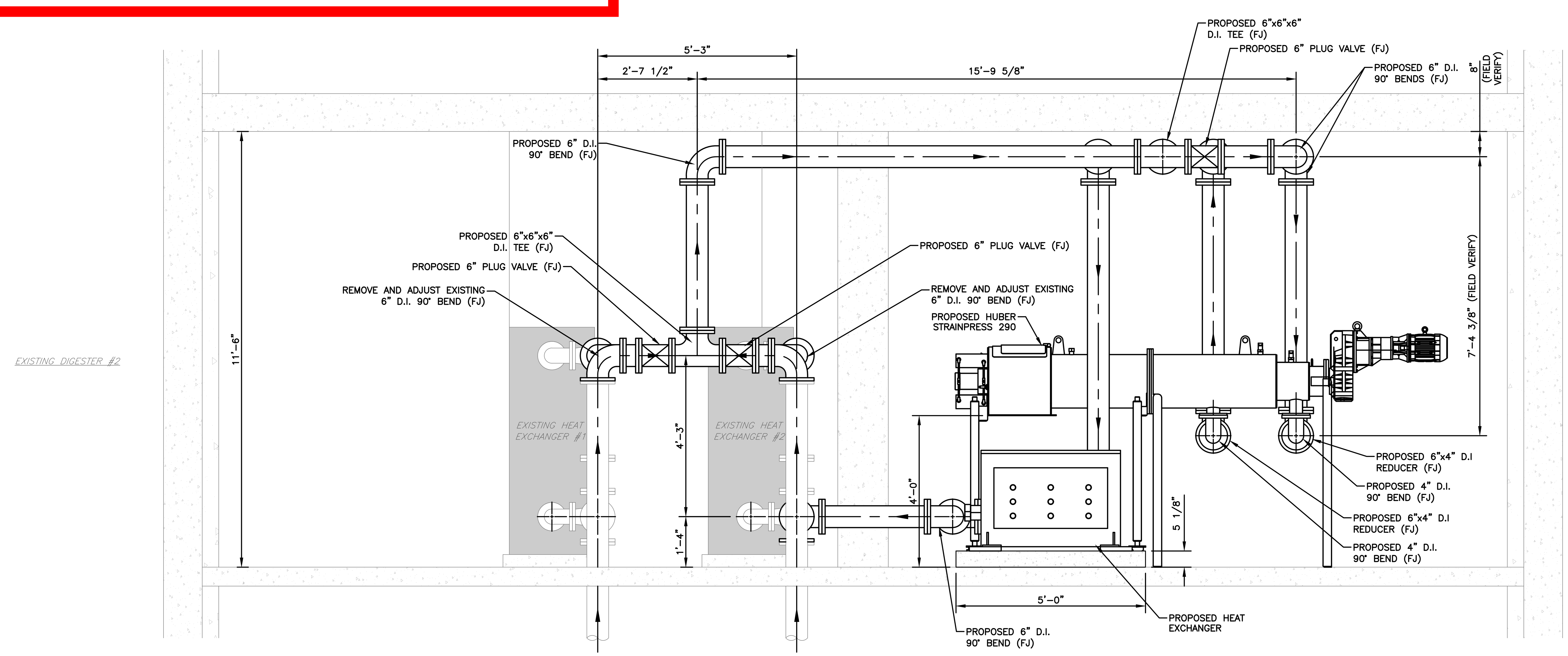
DRAWING NO.:

SHEET OF

DRAFT - FOR REVIEW ONLY



PROPOSED IMPROVEMENTS
SECTION C-C
SCALE: 1/2" = 1 FOOT



PROPOSED IMPROVEMENTS
SECTION D-D
SCALE: 1/2" = 1 FOOT

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

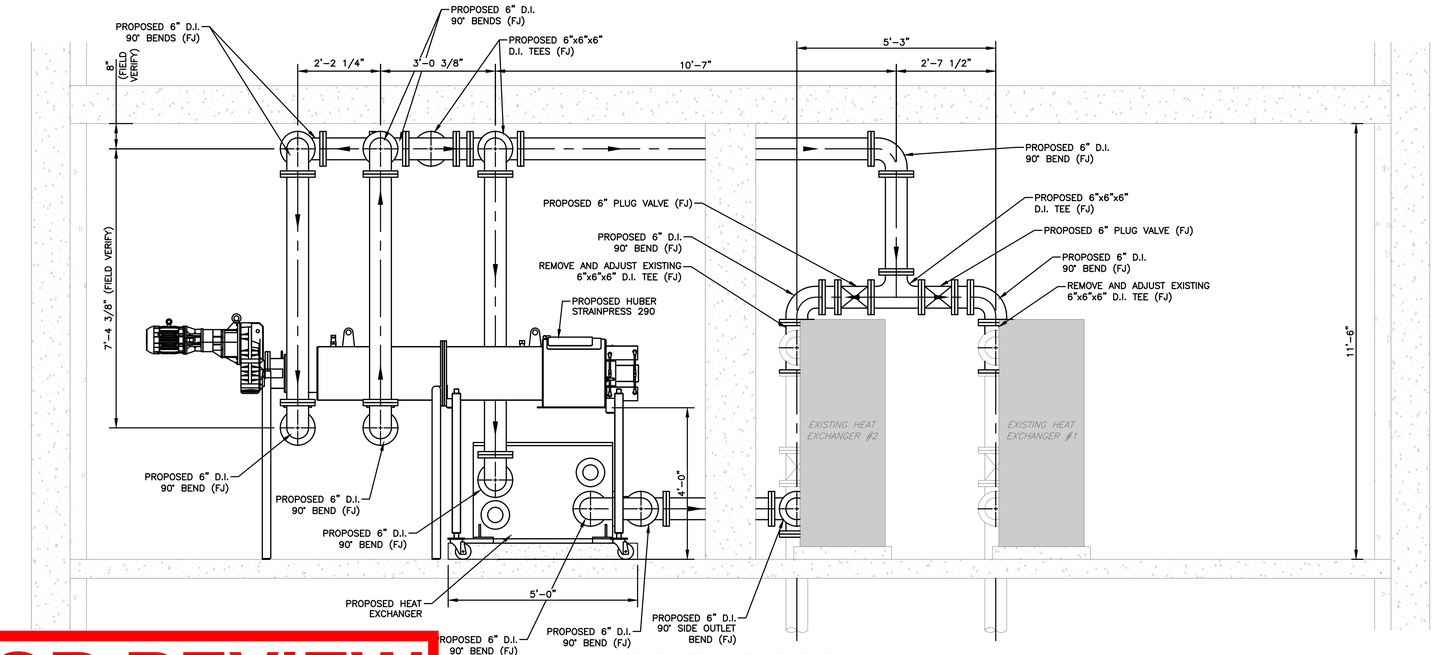
CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DATE:	1/11/21
DRAWN BY:	JBH
DWG SCALE:	AS SHOWN
CHECKED BY:	TWA
PROJECT NO:	302-609
APPROVED BY:	MWF

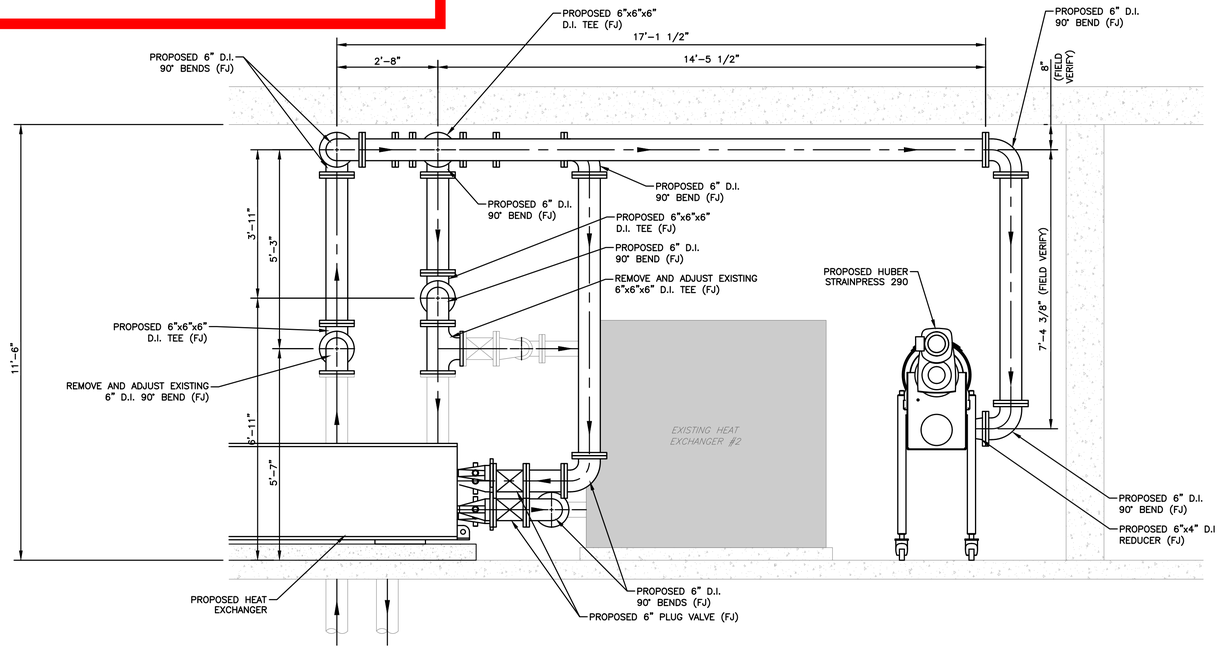
DRAWING NO.:

SHEET OF

P:\300-000\302-609\-CADD\Dwg\CV01\302609-CV01-P-STRUCTURE MAPS.dwg[SCREEN-SECTION A4-BB] LS:(1/11/2021 - jbwillis) - LP: 1/12/2021 1:42 PM



PROPOSED IMPROVEMENTS
SECTION E-E
SCALE: 1/2" = 1 FOOT



PROPOSED IMPROVEMENTS
SECTION F-F
SCALE: 1/2" = 1 FOOT

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON
MOUNT VERNON, OHIO
EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

DATE:	1/11/21
DRAWN BY:	JBH
DWG SCALE:	AS SHOWN
CHECKED BY:	TWA
PROJECT NO:	302-609
APPROVED BY:	MWF

DRAWING NO.:

SHEET OF

P:\302-0001\302-609\-CADD\Dwg\CIVIL\302609-CIV01-P-STRUCTURE IMPS.dwg[SCREEN-SECTION CC-2D] LS(1/11/2021 - jhelm) - LP: 1/12/2021 1:42 PM

PHOSPHORUS REMOVAL INFORMATION

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Nutrient Removal - Combination Removal					
Ovivo EloVac - Chemical Phosphorus Removal System					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New Ovivo EloVac Chemical Phosphorus Removal System	1	**EA**	$ 1,500,000.00	**$/EA**	$ 1,500,000.00
New Magnesium Chloride Dosing System	1	**EA**	$ 25,000.00	**$/EA**	$ 25,000.00
Installation of CPR Equipment (Process Piping, Fiberglass Shelter)	1	**LS**	$ 500,000.00	**$/LS**	$ 500,000.00
Alum Feed & Storage System	1	**LS**	$ 50,000.00	**$/LS**	$ 50,000.00
Associated Piping, Valves, Etc.	1	**LS**	$ 60,000.00	**$/LS**	$ 60,000.00
Electrical, Lighting & HVAC	1	**LS**	$ 100,000.00	**$/LS**	$ 100,000.00
Sub-Total					**$ 2,265,000.00**

SUBTOTAL	**$**	**2,265,000.00**
Contingency (10%)	$	227,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**2,492,000.00**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**748,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**3,240,000.00**
SAY	**$**	**3,240,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY	Yearly Operations Cost
Estimated O&M	$ 79,000.00
Alum Yearly Chemical Cost @ 3.0 MGD	$497,330.00
Sub-Total	**$ 576,330.00**

Total Yearly O&M Costs	$	577,000.00
Discount Rate (I = 2%)	0.02	
Planning Period (n = Life Expectancy)	20	
Total Capital Cost	$	3,240,000.00
Annual O&M Cost	$	577,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)	0.061156718	
Equilavlent Annual Operating Cost (EAOC)	$	776,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)	0.02	
Planning Period (n = Life Expectancy)	20	
Total Capital Cost	$	3,240,000.00
Annual O&M Cost	$	577,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)	16.35143334	
Present Worth of Annual O&M Cost	$	9,434,777.04
Net Present Value	$	12,674,777.04

NPV = Total Capital Cost + Present Worth of Annual O&M

OVIVO Worldwide Experts in Water Treatment

Municipal
BIOSOLIDS
MANAGEMENT

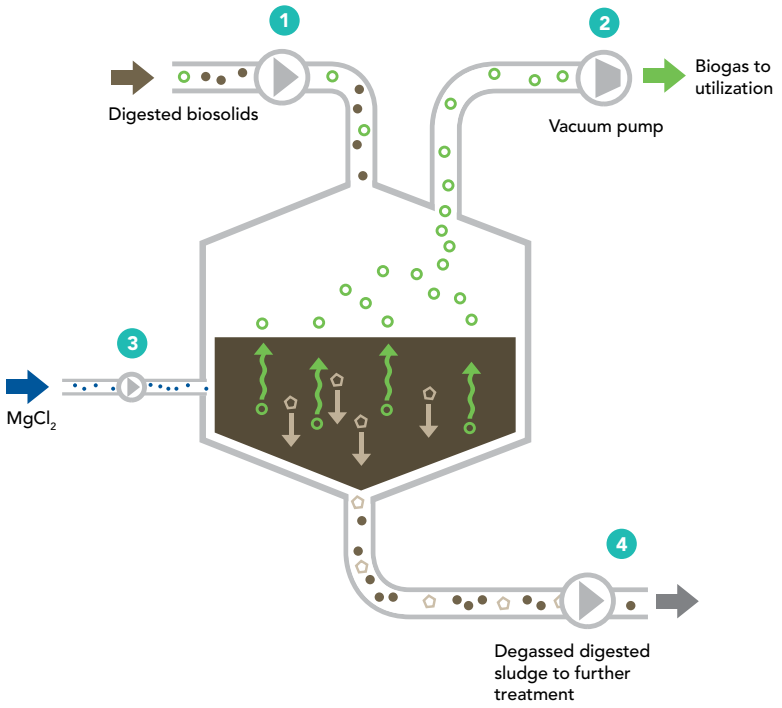
EloVac™-P

Completely skid-mounted, plug and play, compact phosphorus sequestration system that prevents struvite scaling

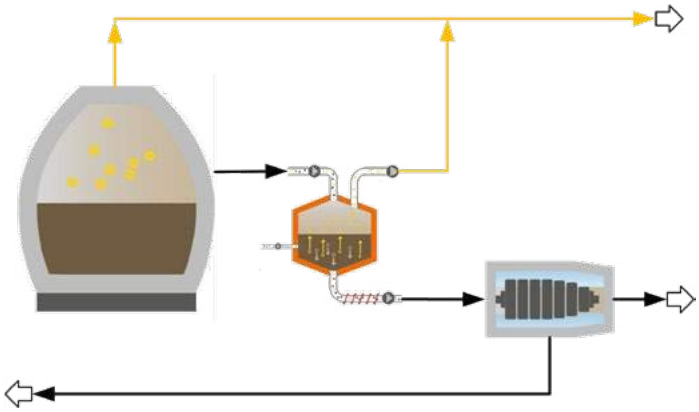
- Simple, compact and modular system
- Increase dewaterability by up to 5%
- Reduction of the phosphorous return load to the head works of the plant
- Degassing allows for additional recovery of methane from digested biosolids
- Plug and play design with no aeration required

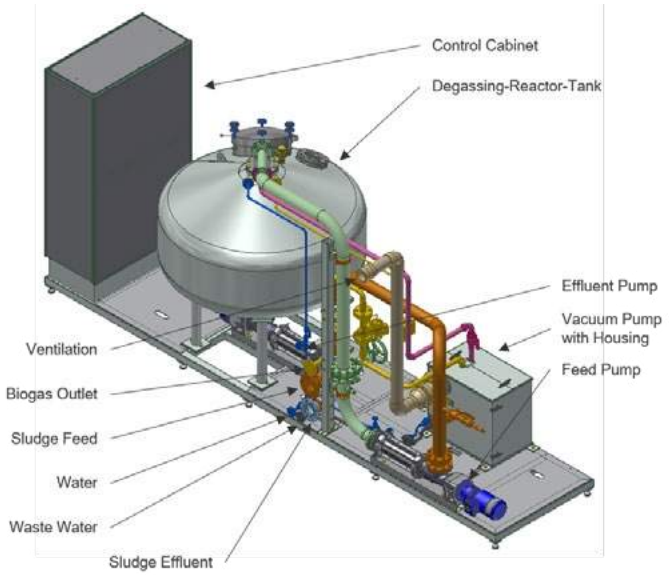
OPERATING PRINCIPLE

1. Sludge is continuously fed to the degassing reactor tank.
2. A vacuum pump extracts the methane and CO_2 from the digested sludge to raise the pH in the reactor tank. The vacuumed gas enables an energy-positive operation by capturing additional biogas, while drastically reducing greenhouse gas emissions.
3. $MgCl_2$ is added to the digested sludge in the reactor tank and together with the higher pH, creates the perfect environment within the reactor tank to precipitate and remove the phosphorus present in the biosolids.
4. Continuous discharge of degassed biosolids with the precipitated struvite to dewatering. The EloVac™-P system improves dewatering up to 5%-points. The combined effect of the degassing together with the phosphorus precipitation results in disposal cost savings up to 20%.



HOW IT WORKS



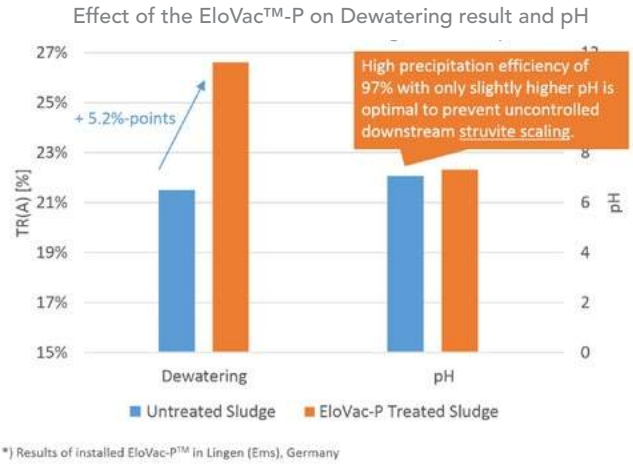


Typically EloVac™-P is installed downstream the digester and upstream the dewatering.

The system is fully automated to minimize operator attention. The system can be remotely monitored by Ovivo through its proprietary WaterExpert™ app for constant Ovivo support.

PROVEN SUCCESS

Performance shows that the technology has produced results above predicted values. In addition, maintenance costs are lower because of the simplicity of the system so downtime is minimized due to cleaning of tanks and regular pump maintenance.



*) Results of installed EloVac-P™ in Lingen (Ems), Germany

Ovivo's Biosolids Management division also offers products such as the LM Mixer, LysoTherm™ Process, DigestivorePAD™ Process, AnammoPAQ™ Process, PHOSPAQ™ Process, Ultrastore® Membranes, BioAlgaNyx™ Treatment, G-TAD, M-TAD and Silc-TAD Processes.

CONTACT

1-855-GO-OVIVO
info@ovivowater.com
www.ovivowater.com

CHEM-FEED®

Engineered Skid Systems

Single pump model number CFS-1AA-XAAA
Shown with Flex-Pro A3 pump sold separately

Dual pump model number CFS-2AA-XAAA
Shown with Flex-Pro A3 pumps, sold separately

Note: Your Chem-Feed Engineered Skid System may be designed differently from above photos.

ProSeries 2 TWO-YEAR WARRANTY

ProSeries®
by Blue-White Ind.

5300 Business Drive, Huntington Beach, CA 92649 USA
Phone: 714-893-8529 **FAX:** 714-894-9492
E mail: sales@blue-white.com **or** techsupport@blue-white.com **URL:** www.blue-white.com

TABLE OF CONTENTS

1.0 Introduction

Congratulations on purchasing the Chem-Feed® Engineered Skid System. The system is designed with the necessary components to safely inject liquid chemical into a system.

Your Chem-Feed® Engineered Skid System is pre-configured based on your selections via the matrix or when designed with our engineering staff.

Please Note: Your new Chem-Feed® System has been pressure tested at the factory with clean water for a minimum of four hours before shipping. You may notice trace amounts of clean water in the system. This is part of our stringent quality assurance program at Blue-White Industries.

2.0 Specifications

Items listed below are standard available items and ship with most configurations. Your system may be customized with components not listed below.

Skid
Chemically resistant polyester powder coated 6061 T6 aluminum. Welded joint construction.

Pump (sold separately)
Flex-Pro model A3 or A4 peristaltic pumps or Chem-Pro model C2 or C3 diaphragm pump. See page 6 for metering pump data.

Piping
PVC Schedule 80 (optional CPVC).

Tubing (T)
Reinforced braided PVC, 200 Psi max, meets NSF std. 51. The pump inlet and outlet flexible tubing connections are terminated to half unions and secured to the barbed fitting with stainless steel clamps. The calibration cylinder fill

Tubing clamps
300 series SS band, 400 series SS screw

Unions (U)
PVC body, schedule 80, FKM seals

Ball valves (V)
Vented ball type, True unions, PVC body, PTFE shaft bearings and seats, FKM seals

Pressure Relief Valve (PRV)
PVC body, PTFE primary diaphragm seal. Non-wetted components: FKM secondary seal, zinc plated steel spring, stainless steel external hardware, HDPE pressure adjusting screw and locknut. Infinite adjustment from 5-100 psi. Maximum inlet pressure 150 psi.

Calibration Cylinder (CC)
PVC body, PVC end caps, 1/4" ID tubing outlet vent.
Available volumes: 1.6 GPH (100ml), 4 GPH (250ml), 8 GPH (500ml), 16 GPH (1000ml), 32 GPH (2000ml).

Pulsation Dampener (PD)
CPVC body,10 cubic inch volume, FKM bladder (optional EPDM bladder)

Gauge w/guard (G)
Gauge: liquid filled stainless steel with blowout plug, bottom mount, 1/4" NPT theads. Available pressure ranges: 0-30 psi, 0-100, psi, 0-200 psi.
Guard: PVC body, FKM diaphragm seal, temperature compensated oil filled.

Check Valve (CV)
PVC body, FKM diaphragm (optional EPDM). Cracking pressure: 1.0-1.5 psi. Maximum working pressure: inlet = 150 psi, back = 100 psi.

Flow Indicator (F)
Machined cast acrylic, PVC connections, ceramic ball, polypropylene ball stop, PVC half unions, FKM seals (optional EPDM).

Y Strainer (S)
PVC body, FKM seals (optional EPDM).

Universal mounting blocks
PVC

Pump extended mounting brackets
316 Stainless Steel

Skid mounting foot pads
316 Stainless Steel

Mounting hardware
18-8 Stainless Steel

Drip Tray
Polypropylene

Maximum working pressure
150 psig (10.3 bar)

Operating Temperature
14°F to 115°F (-10°C to 46°C)

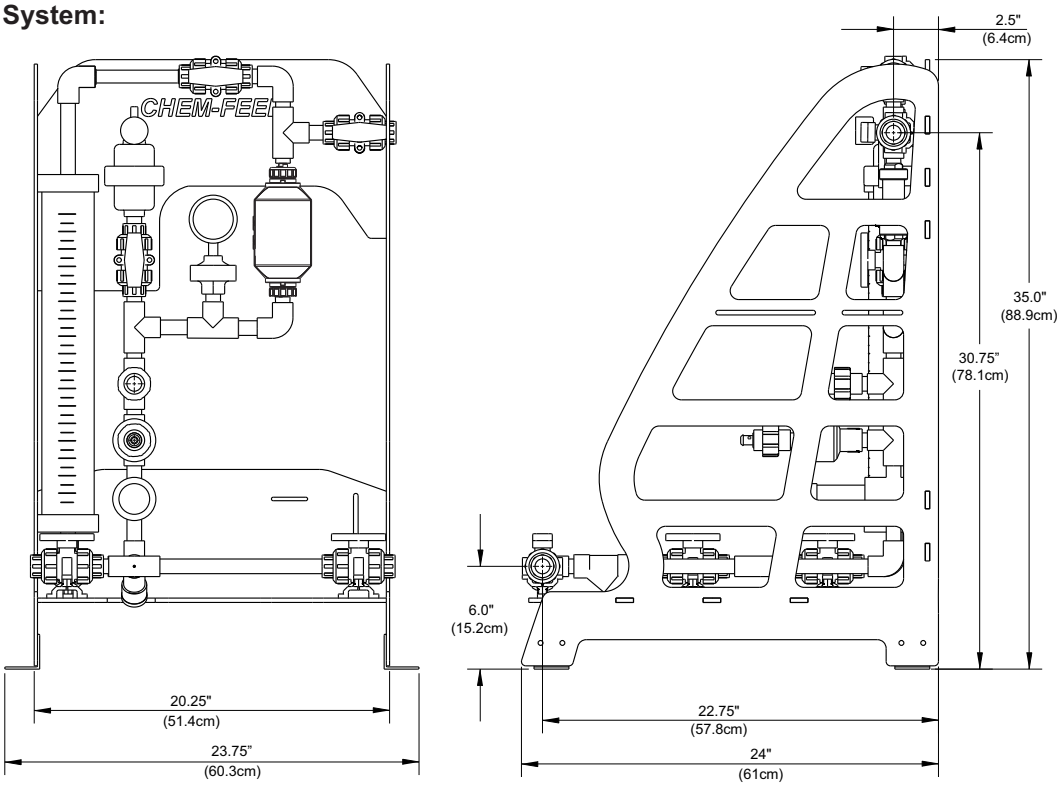
Drip Tray
16" x 21" x 3" - 4 gallons total containment

Approximate Shipping Weight
Single Pump System: 50 lb. (22.7 Kg)
Dual Pump System: 60 lb. (27.2 Kg)

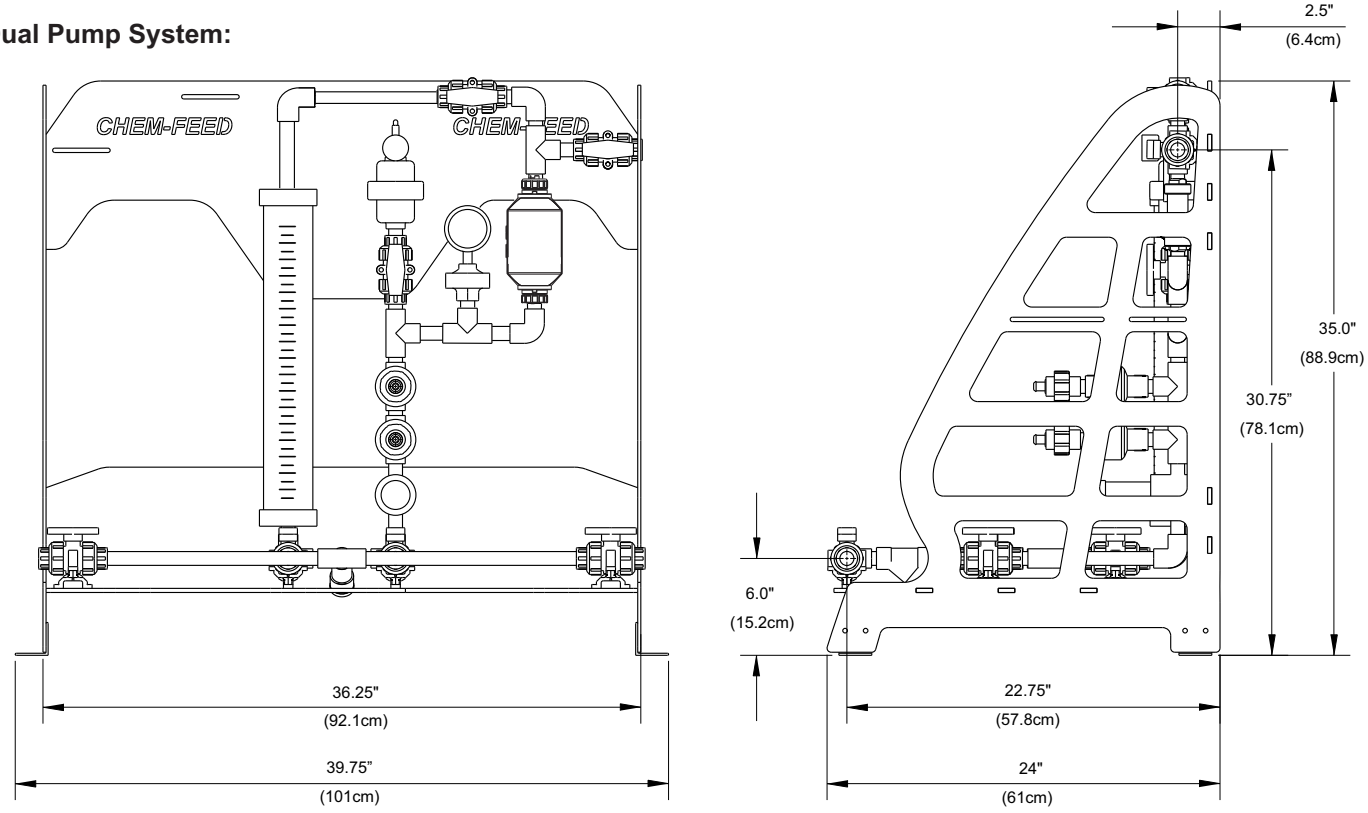
3.0 Dimensions

Your Chem-Feed System may be designed differently from drawings below. However, the dimensions shown below remain the same no matter your configuration.

Single Pump System:



Dual Pump System:



4.0 Features

Chem-Feed® Engineered Skid Systems were designed and engineered using solid modeling tools for superior piping installation and easy component maintenance. Custom engineered universal mounting blocks and pre-machined mounting slots provide for easy component servicing and replacement. Each factory built and tested system includes the following standard components:

- **Pressure Relief Valve -** Protects the system from over-pressurization, 5-100 psi setting range, 150 psi maximum system pressure. Ships on all systems.
- **Check Valve -** Protects the user from back-flow during pump maintenance. Ships on all systems.
- **Flow Verification Sensor -** S6A accurately verifies chemical feed. Exclusive to Blue-White®.
- **Inlet Y Strainer -** Protects system components from damage cause by dirt or debris.
- **Calibration Cylinder -** Confirm pump output under system conditions. Specify cylinder volumes from 1.6 GPH to 32 GPH.
- **Pulsation Dampener -** Protect the system components from pulsation. Recommended for diaphragm pump systems. Not recommended for peristaltic pump systems.
- **Pressure Gage with Guard -** Isolate and protect the system pressure gage. Specify pressure ranges from 0-100psi, or 0-200 psi.
- **Mounting Pads -** Stainless Steel mounting pads to secure Chem-Feed® System to a solid surface. Designed for floor mount or wall mount.
- **Corrosion Resistant -** Chem-Feed® frame constructed of chemically resistant polyester powder coated 6061 T6 aluminum. Welded joint construction.

5.0 Chem-Feed® Skid System Matrix

Chem-Feed® Engineered Skid System Matrix

Chem-Feed Engineered Skid System Matrix			
System type			
CFS-1	Single pump system - single chemical / single outlet		
CFS-2	Dual pump system - single chemical / single outlet		
Piping / Valves / Unions / Seal Materials			
A	PVC piping, FKM seals, 3/4" OD PVC braided tubing connections	**E**	CPVC piping, FKM seals, 3/4" OD PVC braided tubing connections
B	PVC piping, EPDM seals, 3/4" OD PVC braided tubing connections	**F**	CPVC piping, EPDM seals, 3/4" OD PVC braided tubing connections
C	PVC piping, FKM seals, 3/8" OD Polyethylene tubing connections	**G**	CPVC piping, FKM seals, 3/8" OD Polyethylene tubing connections
D	PVC piping, EPDM seals, 3/8" OD Polyethylene tubing connections	**H**	CPVC piping, EPDM seals, 3/8" OD Polyethylene tubing connections
X	Skid Frame only without piping		
Structure Assembly Materials			
A	Chemical resistant powder coated aluminum stand with 316SS mounting pads		
Chemical Feed Flowmeters			
E	Model S6A12 Chemical Feed Flowmeter with meter mounted display, 10-5,000 ml/min (0.158 - 79.2 GPH)		
F	Model S6A22 Chemical Feed Flowmeter with meter mounted display, 100-10,000 ml/min (1.58 - 158.0 GPH)		
5	Model S6A11 Chemical Feed Flowmeter with remote mounted display, 10-5,000 ml/min (0.158 - 79.2 GPH)		
6	Model S6A21 Chemical Feed Flowmeter with remote mounted display, 100-10,000 ml/min (1.58 - 158.0 GPH)		
X	None		

Calibration Cylinder	**PVC**	**Glass**
1.6 GPH (100 ml)	**E**	**S**
4 GPH (250 ml)	**D**	**R**
8 GPH (500 ml)	**C**	**Q**
16 GPH (1000 ml)	**B**	**P**
32 GPH (2000 ml)	**A**	
X None		

Pulsation Dampener	
A	10 cubic inch, CPVC body, PTFE diaphragm
X	None

Pressure Gauge w/Guard	
A	200 PSI gauge, PTFE diaphragm
B	100 PSI gauge, PTFE diaphragm
C	30 PSI gauge, PTFE diaphragm
X	None

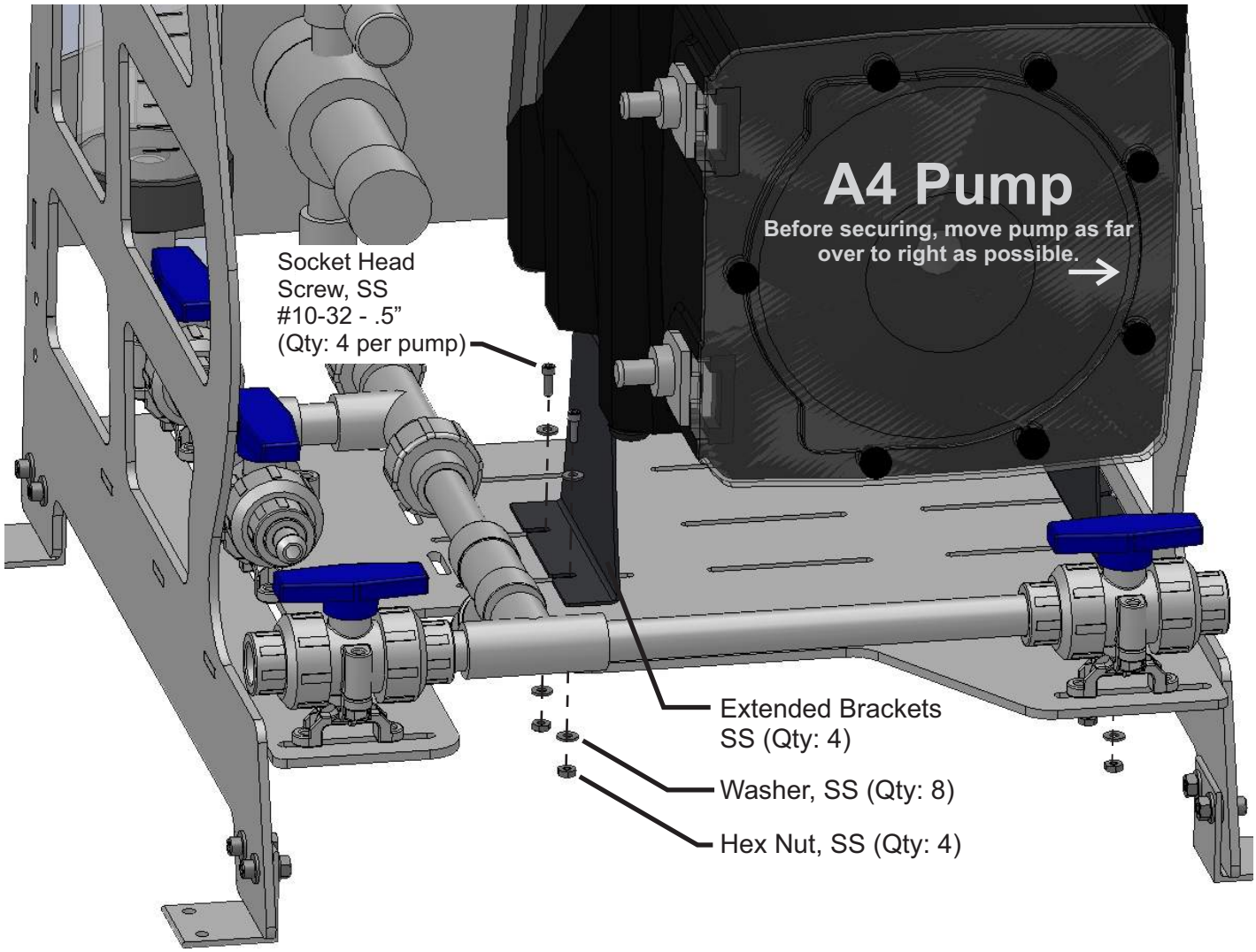
Miscellaneous Options - (leave blank if not specified)	
A	Isolation ball shut-off valves at check valves
R	Outlet plumbing and calibration column position switched (Only avaliable on the dual skid)
1	Install a specific pump model on the skid and perform pressure and fluid testing
2	Install two specific pump models on the skid and perform pressure and fluid testing

CFS-1	A	A	-	E	A	X	B	-	A	**Sample Chem-Feed Engineered Skid System Part Number**

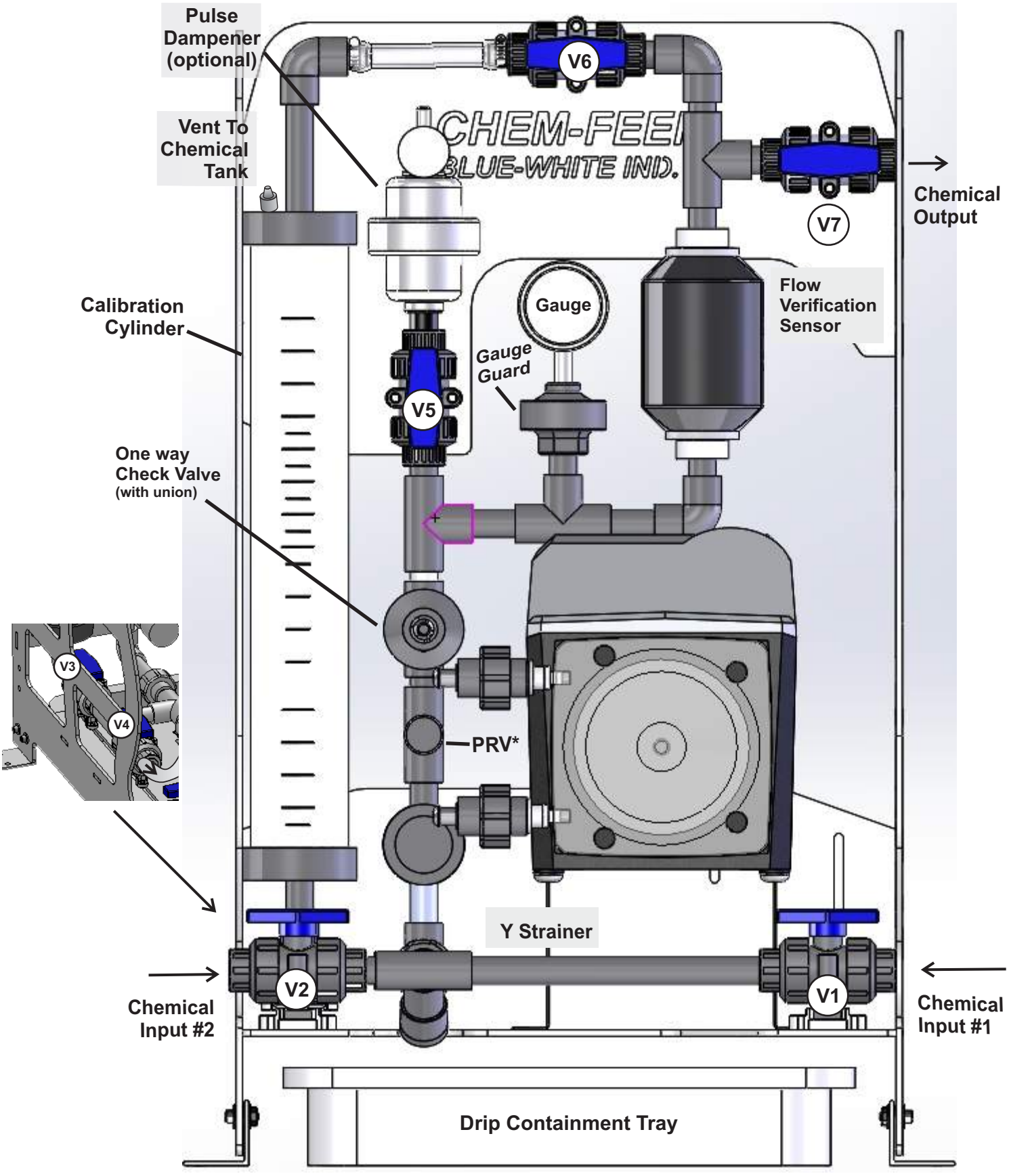
Note:
All skid systems ship with the following in/out union connections:

- ½" PVC female NPT
- ½" PVC slip glue

6.0 Mounting Pump to the Chem-Feed® System - Single and Dual System



7.0 Component Identification and Typical Operation - Single Pump Skid



* PRV = Pressure Relief Valve preset at 50% maximum gauge rating.

7.1 How To Operate the Chem-Feed® Skid System - Single Pump Skid

Connections:

Connect chemical solution into either Inlet 1 or inlet 2. (V-1 or V-2)

Connect chemical treated system to outlet. (V-7)

Connect safety vent adapter with 1/4” ID tube from top of calibration cylinder to chemical supply tank.

To Pump chemical solution into system.

Open ball valve V-1 or V-2, depending on your inlet side.

Close ball valve V-3.

Open ball valve V-4.

Close ball valve V-6.

Open ball valve V-7 to inject chemical solution into your system.

Start pump.

To calibrate pump / system.

Open ball valve V-1 or V-2, depending on your inlet side.

Close ball valve V-3.

Open ball valve V-4.

Close ball valve V-7.

Open ball valve V-6.

Start pump and run until calibration cylinder is filled to top calibration line. Do not leave pump unattended during this operation.

Stop pump once calibration cylinder is filled.

Close ball valves V-1 and V-2.

Close ball valve V-6.

Open ball valve V-3.

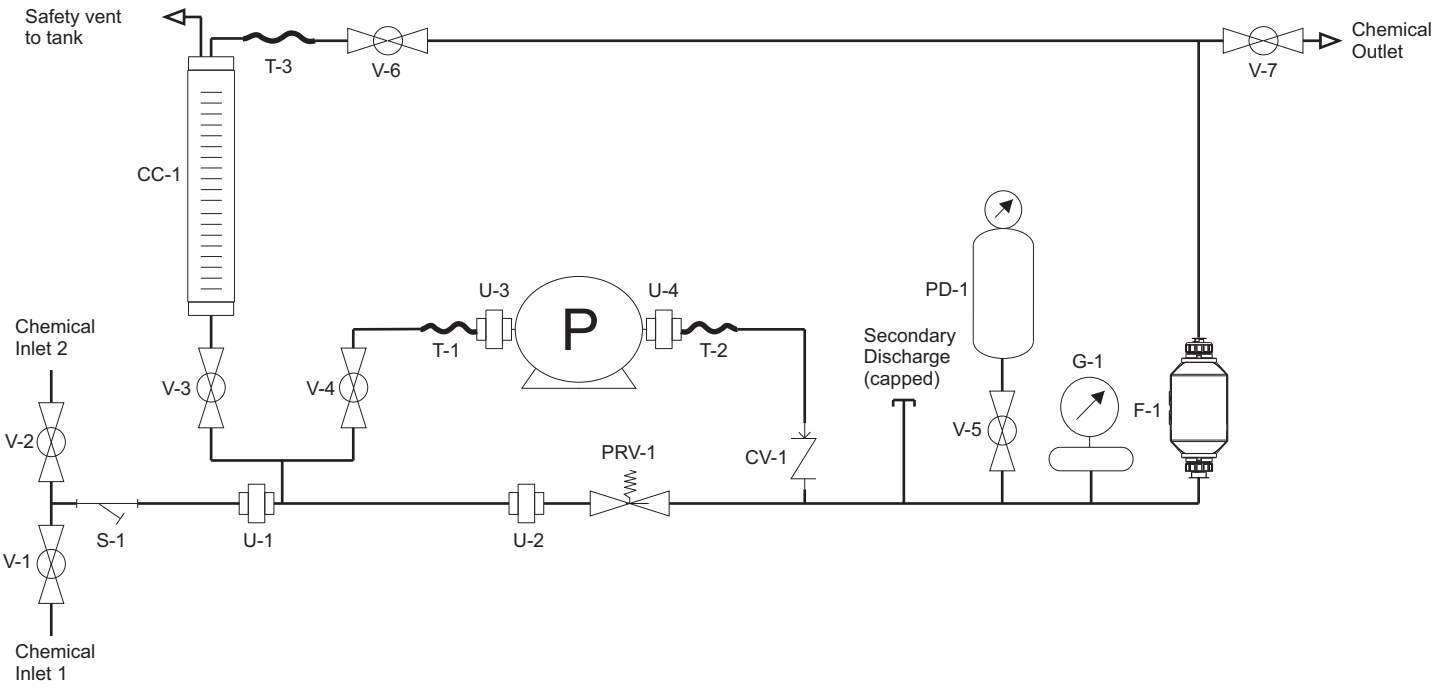
Open ball valve V-4.

Open ball valve V-7 to inject chemical solution into your system.

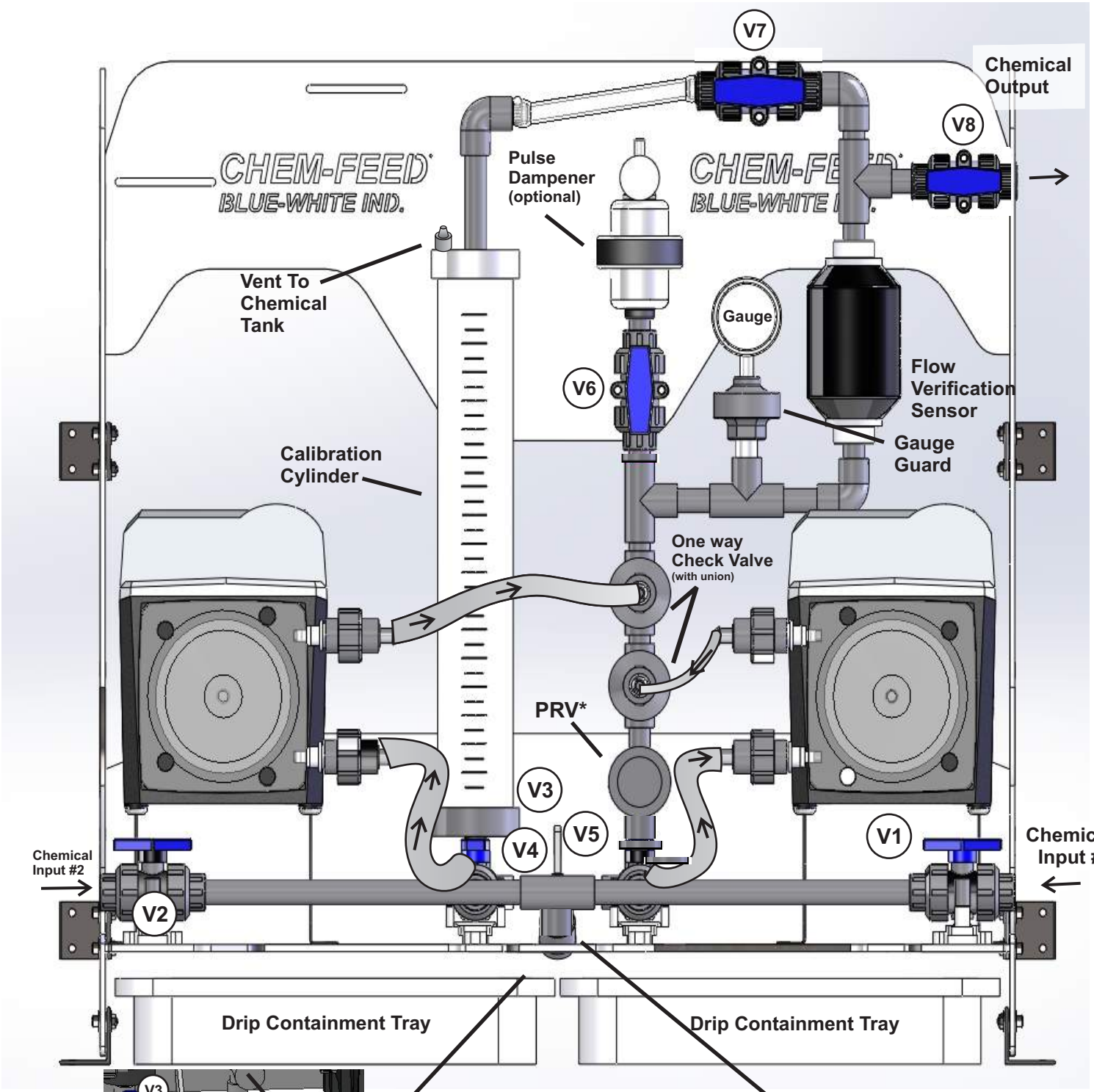
Note the chemical solution level in the calibration cylinder.

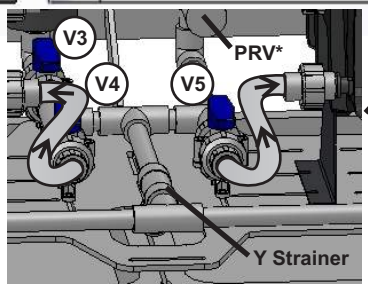
To calibrate pump at maximum speed into your system, Press the prime button on pump. The prime mode runs the pump at maximum speed for 60 seconds (1 minute) on all Blue-White® ProSeries(r) pumps.

To calibrate pump at your desired feed rate, you must pre-program your pump speed before running this routine. Please refer to the instruction manual for your pump to adjust feed rate and additional calibration instructions.



8.0 Component Identification and Typical Operation - Dual Pump Skid





* PRV = Pressure Relief Valve preset at 50% maximum gauge rating.

8.1 How To Operate the Chem-Feed® Skid System - Dual Pump Skid

Connections:

Connect chemical solution into either Inlet 1 or inlet 2. (V-1 or V-2)

Connect chemical treated system to outlet. (V-8)

Connect safety vent adapter with 1/4" ID (3/8" OD) tube from top of calibration cylinder to chemical supply tank.

To Pump chemical solution into system.

Open ball valve V-1 or V-2, depending on your inlet side.

Close ball valve V-3.

Open ball valve V-4 and / or V5. Depending on your system design.

Close ball valve V-7.

Open ball valve V-8 to inject chemical solution into your system.

Start pump(s).

To calibrate pump(s) / system.

Open ball valve V-1 or V-2, depending on your inlet side.

Close ball valve V-3.

Open ball valve V-4 or V5, depending on which pump you're calibrating.

Close ball valve V-8.

Open ball valve V-7. This open valve will direct chemical into calibration cylinder.

Start pump and run until calibration cylinder is filled to top calibration line. Do not leave pump unattended during this operation!

Stop pump once calibration cylinder is filled.

Close ball valves V-1 and V-2.

Close ball valve V-7.

Open ball valve V-3.

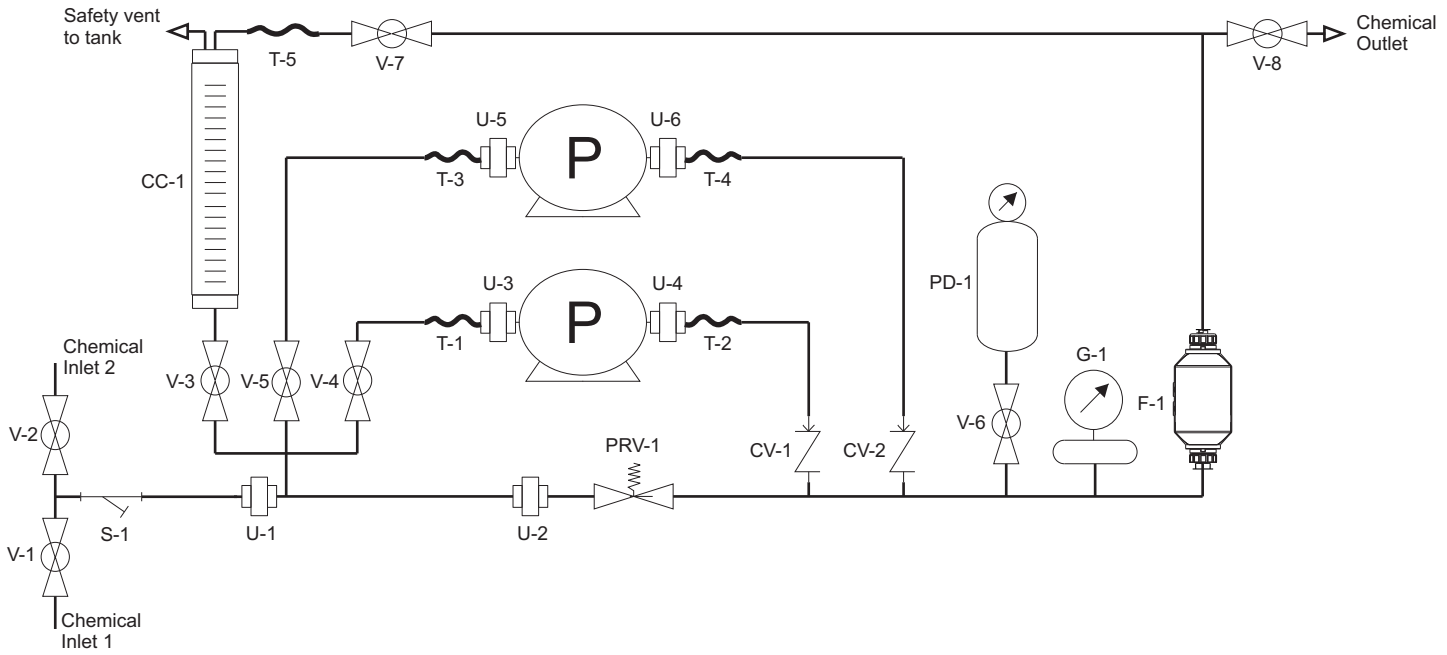
Open ball valve V-4 or V5, depending on which pump you're calibrating.

Open ball valve V-8 to inject chemical solution into your system.

Note the chemical solution level in the calibration cylinder.

To calibrate pump at maximum speed into your system, Press the prime button on pump. The prime mode runs the pump at maximum speed for 60 seconds (1 minute) on all Blue-White® ProSeries(r) pumps.

To calibrate pump at your desired feed rate, you must pre-program your pump speed before running this routine. Please refer to the instruction manual for your pump to adjust feed rate and additional calibration instructions.



LIMITED WARRANTY

Your new Chem-Feed Engineered Skid System is a quality product and is warranted for 24 months from date of purchase (proof of purchase is required). The system will be repaired or replaced at our discretion. The metering pump may have its own warranty and is not covered under this warranty.

WHAT IS NOT COVERED

- **The metering pump is covered under a separate warranty.**
- **Removal, re-installation, and any related labor charges.**
- **Freight to the factory, or ProSeries service center.**
- **Systems that have been tampered with, or in pieces.**
- **Damage to the System that results from misuse, carelessness such as chemical spills, abuse, lack of maintenance, unsuitable materials of construction, or alteration which is out of our control.**
- **Systems damaged by acts of nature.**

Blue-White Industries does not assume responsibility for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the system manual. System components not manufactured by Blue-White are warrantied by their respective manufacturers. Manufacturer makes no warranty of fitness or merchantability. Purchaser assumes all liability in determining the acceptability of the system in their specific application.

Warranty status is determined by the system serial label and the sales invoice or receipt. The serial label must be on the system and legible. The warranty status of the system will be verified by Blue-White or a factory authorized service center.

OTHER IMPORTANT WARRANTY INFORMATION

Blue-White engineered skid systems are factory tested with water only for pressure and performance. Installers and operators of these systems must be well informed and aware of the precautions to be taken when injecting various chemicals - especially those considered hazardous or dangerous. Eye protection must be worn when working around this product.

Should it become necessary to return the system or system components for repair or service, you must attach information regarding the chemical used as some residue may be present within the unit which could be a hazard to service personnel. Blue-White Industries will not be liable for any damage that may result by the use of chemicals with their system and its components.

PROCEDURE FOR IN WARRANTY REPAIR

Contact the factory to obtain a RMA (Return Material Authorization) number. Carefully pack the system or component to be repaired. Please enclose a brief description of the problem as well as the original invoice or sales receipt, or copy showing the date of purchase. Prepay all shipping costs. COD shipments will not be accepted. Warranty service must be performed by the factory or an authorized ProSeries service center. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair or replacement is completed, the factory pays for return shipping to the dealer or customer.

Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC.
Contact your local waste recovery agency for a *Designated Collection Facility* in your area.

ProSeries® by Blue-White Ind.

5300 Business Drive, Huntington Beach, CA 92649 USA
Phone: 714-893-8529 **FAX:** 714-894-9492
E mail: sales@blue-white.com **or** techsupport@blue-white.com **URL:** www.blue-white.com

P.N. 80000-462 Rev 9 20200706

SOLIDS HANDLING INFORMATION

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Solids Handling & Removal Equipment					
Mobilization/Demobilization	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Pre-Construction Videotaping of Project Area	1	**LS**	$ 5,000.00	**$/LS**	$ 5,000.00
New Alfalaval 2.0 Meter AS-H Belt Filter Press	1	**EA**	$ 304,800.00	**$/EA**	$ 304,800.00
New Chemco Systems Lime Pugmill and Feeder	1	**EA**	$ 205,200.00	**$/EA**	$ 205,200.00
New Veloedyne Polymer Dosing System	1	**EA**	$ 23,525.00	**$/EA**	$ 23,525.00
Chemical Dosing & Solids Handling Building (50' X 40' X 20')	2,000	**SF**	$ 150.00	**$/SF**	$ 300,000.00
Structual Concrete	100	**CY**	$ 1,300.00	**$/CY**	$ 130,000.00
Associated Piping, Valves, Etc.	1	**LS**	$ 60,000.00	**$/LS**	$ 60,000.00
Electrical, Lighting & HVAC	1	**LS**	$ 100,000.00	**$/LS**	$ 100,000.00
Installation of New Solids Handling Equipment & Chemical Dosing	1	**LS**	$ 160,057.50		$ 160,057.50
Sludge Storage Building					
Building (50' X 50' X 20' High)	2,500	**SF**	$ 150.00	**$/SF**	$ 375,000.00
Structural Concrete	200	**CY**	$ 1,300.00	**$/CY**	$ 260,000.00
Electrical & Lighting	1	**LS**	$ 20,000.00	**$/LS**	$ 20,000.00
Ventilation	1	**LS**	$ 30,000.00	**$/LS**	$ 30,000.00
Sub-Total					**$ 1,973,582.50**

SUBTOTAL	**$**	**1,973,582.50**
Contingency (10%)	$	197,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**2,170,582.50**
Estimate of Probable Project Costs and Professional Services (30%)	**$**	**651,000.00**
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**2,821,582.50**
SAY	**$**	**2,822,000.00**

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

ALL REPLACEMENT COSTS CALCULATED OFF OF EQUIPMENT COST OVER LIFE EXPECTANCY OF THE EQUIPMENT

WORK ACTIVITY	Yearly Operations Cost
Estimated O&M (Polymer Dosing, Lime Dosing, Belt Filter Press)	$ 27,000.00
Sub-Total	**$ 27,000.00**

Total Yearly O&M Costs	$	27,000.00
Discount Rate (I = 2%)	0.02	
Planning Period (n = Life Expectancy)	20	
Total Capital Cost	$	2,822,000.00
Annual O&M Cost	$	27,000.00
A/P,I,n , (A/P,I,n) = (i(1+i)^n)/((1+i)^n - 1)	0.061156718	
Equilavlent Annual Operating Cost (EAOC)	$	200,000.00

EAOC = (Capital Investment)(A/P,I,N) + Yearly O&M

Discount Rate (I = 2%)	0.02	
Planning Period (n = Life Expectancy)	20	
Total Capital Cost	$	2,822,000.00
Annual O&M Cost	$	27,000.00
Uniform Series Present Worth Factor, USPWF = ((1+i)^n - 1)/(i(1+i)^n)	16.35143334	
Present Worth of Annual O&M Cost	$	441,488.70
Net Present Value	$	3,263,488.70

NPV = Total Capital Cost + Present Worth of Annual O&M

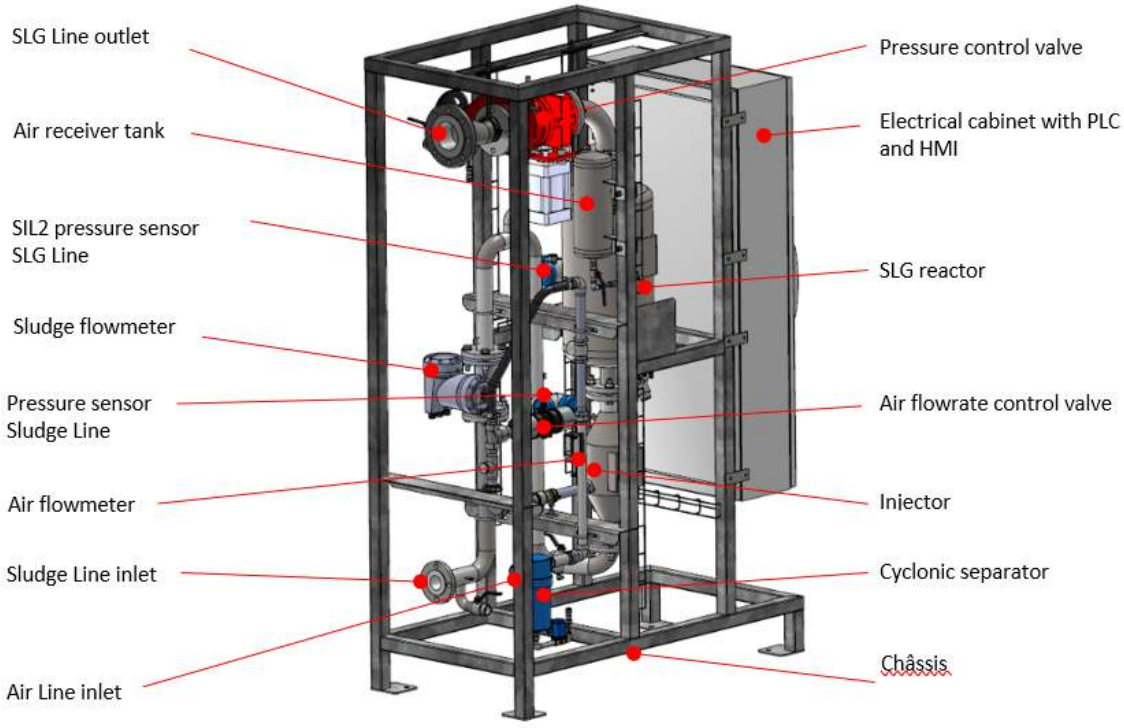
SLG® Technology

Added value for new Alfa Laval Belt Presses and Rebuilds done by Alfa Laval

The SLG® Solution is a proprietary and patented technology designed and built by Orege for the enhancement of existing sludge dewatering operations using new Alfa Laval belt presses and also with rebuilds performed by Alfa Laval on existing belt presses. SLG® Solutions increase cake dryness, improve filtrate quality, and enhance odor/ corrosive gas control. Additional SLG® benefits may also include reduced polymer usage and increased throughput. The SLG® Solution is unique in that it transforms with only compressed air, the physical and microbiological characteristics of the sludge, creating an emulsified air/sludge mixture before it enters the dewatering/ thickening device. This emulsified SLG® sludge often requires a re-evaluation and re-optimization of the existing dewatering/ thickening program to achieve the best results from the transformed emulsion.

SLG® Solution Scope

- SLG® skid
- Air compressor skid
- HMI panel
- Deaerator
- Equipment installation (described below)
- Commissioning start-up, operator training
- One (1) year of Optimization Services
- Operations and Maintenance documentation



General overview of SLG skid

The SLG® Solution scope excludes polymer unit (if required), shipping, or any required process changes to the sludge line identified during the installation.

Orege Turnkey Installation Scope if requested:

The turnkey installation includes placement and connection of the SLG® Solution to existing utilities, connection to new or existing sludge piping and polymer feed system.

The Customer will be responsible for any required regulatory permitting, providing adequate site utilities within 5 feet of the SLG® installation location, structural and/or site improvements, instrumentation and control improvements, and/or programming of control systems.

SLG® Performance

Project completion will be determined by successfully meeting the predetermined performance criteria which is to demonstrate an average increase in cake solids from the belt filter press greater than or equal to 2.0% DS.

SLG® Solution Optimization Services by Orege (after 1st year) – Optional Adder

Orege is vested in the successful operations of our customers' plants. To that end, Orege offers Optimization and Support Services to the Customer with renewal options available annually. This optional service will be performed by qualified Orege personnel and Alfa Laval can help you contact Orege directly if this option is elected.

Please contact us for more information and if you require a proposal.

TERMS AND CONDITIONS OF SALE

These Terms and Conditions of Sale ("Terms and Conditions") apply to all quotations, orders, and contracts for Alfa Laval Inc. products (hereafter "Equipment") and associated services ("Services") As used in these Terms and Conditions, the word "Equipment" includes all hardware, parts, components, software and options.

1. **ACCEPTANCE**: Our sale to you is limited to and expressly made conditional on your assent to these Terms and Conditions and, if applicable, on the attendant quotation, both of which form a part of the contract between us and which supersede and reject all prior agreements, representations, discussions or negotiations, whether written or oral, with respect to this sale and any conflicting terms and conditions of yours, whether or not signed by you. Any terms and conditions contained in your purchase order or request for quotation or other form which are different from, in addition to, or vary from these Terms and Conditions are expressly rejected, shall not be binding upon us, and are void and of no force or effect. These Terms and Conditions may not be changed except by the written agreement of both parties.

2. **PRICES**: Unless otherwise specified in writing, all quoted prices are in U.S. Dollars and are firm for thirty (30) days from the date of offer. Prices quoted are exclusive of taxes, freight and insurance, and you agree to pay any and all sales, revenue, excise or other taxes (exclusive of taxes based on our net income) applicable to the purchase of Equipment. If you claim an exemption from any such taxes you shall provide us with a tax exemption certificate acceptable to the taxing authorities.

3. **DELIVERY; FORCE MAJEURE**: Dates for the furnishing of Services and/or delivery or shipment of Equipment are approximate only and are subject to change. Quoted lead times are figured from the date of receipt of complete technical data and approved drawings as such may be necessary. We shall not be liable, directly or indirectly, for any delay in delivery or failure to deliver caused by carriers or by labor difficulties, shortages, strikes or stoppages of any sort, or difficulties in obtaining materials from ordinary sources and suppliers. In addition, we shall not be liable for any such delays or for any failure to perform our obligations under an order or contract due to any one or more of the following events, whether foreseeable or not: war, hostilities, military operations, terrorism, riots, disorder, accidents, floods, storms, natural disasters, fires, acts of God, epidemics and/or pandemics (and specifically in relation hereto and notwithstanding anything else stated herein, whether or not outbreak of such epidemic or pandemic has occurred prior to acceptance of this order or execution of a contract for the Services), governmental, judicial or administrative decisions, decrees or orders, embargoes or blockades, or any causes beyond our reasonable control. Unless otherwise specifically agreed in writing by us, in no event shall we be liable for any damages or penalties whatsoever, or however designated, resulting from our failure to perform or delay in performing due to any of the causes specified in this paragraph 3.

4. **SHIPMENT, RISK OF LOSS, TITLE**: All sales are made F.O.B. Alfa Laval shipping point, unless otherwise noted. Duty, brokerage fees, insurance, packing and handling as applicable are not included unless otherwise noted. Our liability for delivery ceases upon making delivery of Equipment to the carrier at the shipping point in good condition. The carrier shall be your agent. Risk of loss shall pass to you upon such delivery. Regardless of the delivery term specified, we shall retain title to the Equipment until final payment thereof has been made.

5. **CREDIT AND PAYMENT**: Payment terms are (30) days net, unless agreed otherwise by us in writing. *Pro rata* payments shall become due with partial shipments. Any discount period which may be granted by us begins on the invoice date and all payments are due 30 days after the invoice date. All payments shall be made without deduction, deferment, set-off, lien or counterclaim of any nature. All amounts due not paid within 30 days after the date such amounts are due and payable shall bear interest at the lesser of 1.5 percent per month or the maximum rate of interest allowed by law. We reserve the right at any time to suspend credit or to change credit terms provided herein, when, in our sole opinion, your financial condition so warrants. Failure to pay invoices when such invoices are due and payable, at our election, shall make all subsequent invoices immediately due and payable irrespective of terms, and we may withhold all subsequent deliveries until the full account is settled. We shall not, in such event, be liable for delay of performance or nonperformance of contract in whole or in part subsequent to such event.

6. **SECURITY AGREEMENT:** You hereby grant us a security interest in the Equipment, including a purchase money security interest, and in such materials, proceeds and accessories thereof, to secure payment of the purchase price of the Equipment. You authorize us to file or record a purchase order or copy thereof or any UCC financing statement showing our interest in the Equipment in all jurisdictions where we may determine filing to be appropriate, and you agree to sign all such documents reasonably related thereto promptly following our request. You will not encumber the Equipment with any mortgage, lien, pledge or other attachment prior to payment in full of the price therefor.

7. **CANCELLATIONS AND CHANGES**: Orders which have been accepted by us are not subject to cancellation or changes in specification except upon prior written agreement by us and upon terms that will indemnify us against all losses resulting from or arising out of such cancellation or change in specifications. In the absence of such indemnification, we shall be entitled to recover all damages and costs of whatever nature permitted by the Uniform Commercial Code.

8. **DEFERRED SHIPMENT**: If shipment is deferred at your request, payment of the contract price shall become due when you are notified that the Equipment is ready for shipment. If you fail to make payment or furnish shipping instructions, we may either extend the time for so doing or cancel the contract. In case of deferred shipment at your request, storage and other reasonable expenses attributable to such delay shall be payable by you.

9. **EQUIPMENT WARRANTY AND REMEDY**:

(a) For new Equipment only, we warrant to you that the Equipment that is the subject of this sale is free from defects in design (provided that we have design responsibility), material and workmanship. The duration of this warranty is twelve (12) months from start-up or eighteen (18) months from delivery to you, whichever occurs first (the "Warranty Period"). If you discover within the Warranty Period a defect in design, material or workmanship, you must promptly notify us in writing. Within a reasonable time after such notification, we shall repair, replace, or, at our option, refund you the price of the defective Equipment or part thereof.

(b) For repairs, parts and Services provided by us, we warrant to you that the repairs, parts and Services we provide to you will be free from defects in material and workmanship. The duration of this warranty is ninety (90) days from as applicable (i) the date the Equipment which required the repairs, parts or Services is returned to you by us, (ii) the date of your receipt of the part, or (iii) the date of completion of the repair or other Services, if performed at your facility. If during this ninety-day period you discover a defect in the repairs, parts or Services you must promptly notify us in writing, and we shall correct such defect with either new or used replacement parts or reperform the Services as applicable. If we are unable to correct the defect after a reasonable number of attempts, we will provide a refund of the price paid for the defective repair, parts or Services.

(c) All warranty service is subject to our prior examination and approval and will be performed by us at your facility or at service centers designated by us. All transportation to and from the designated service center will be at our expense. The remedies set forth above are your exclusive remedies for breach of warranty. Unless otherwise agreed in writing by us, our warranty extends only to you and is not assignable to or assumable by any subsequent purchaser, in whole or in part, and any such attempted transfer shall render all warranties provided hereunder null and void and of no further force or effect.

(d) The warranties set forth above are inapplicable to and exclude any product, components or parts not manufactured by us or covered by the warranty of another manufacturer. We shall have no responsibility for defects, loss or damage to the extent caused by (i) normal wear and tear, (ii) your failure to follow all installation and operation instructions or manuals or to provide normal maintenance, (iii) repairs or modifications by you or by others not under our direct supervision, or (iv) a product or component part which we did not design, manufacture, supply or repair.

(e) **DISCLAIMER OF IMPLIED WARRANTIES**. THE WARRANTIES SET FORTH ABOVE AND IN SECTION 12 BELOW ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

10. **LIMITATION OF LIABILITY**: In no event shall we be liable, and you hereby waive any claims against us and release us from liability to you, for any indirect, special, punitive, incidental, or consequential damages whatsoever based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory. In no circumstance, shall we be liable for, however such damages are characterized, loss of profits, loss of savings or revenue, loss of use of the Equipment or any associated equipment, cost of capital, cost of any substitute Equipment, facilities or services, downtime, or loss of prospective economic advantage. OUR AGGREGATE LIABILITY FOR FAILURE TO PERFORM, BREACH OF WARRANTY OR BREACH OF OTHER CONTRACTUAL OBLIGATIONS SHALL NOT EXCEED THE TOTAL PRICE PAID TO US FOR THE EQUIPMENT AND SERVICES THAT ARE THE SUBJECT OF ANY CLAIM BY YOU.

11. **OWNERSHIP:** All drawings, designs, specifications, data and other proprietary rights supplied by us (including without limitation in connection with the Equipment) have been prepared or assembled by us and are (and shall remain) exclusively our property, and upon our request you agree to execute any additional documents needed to give effect to the foregoing. Such drawings, designs and specifications have been furnished in order to provide full documentation and on the condition that they shall not be disclosed, reproduced or copied in any manner whatsoever, in whole or in part, except for your internal use as necessary, and upon the further condition that, as our sole property, they shall not be used for furnishing information and/or disclosed, in whole or in part, to others or otherwise for any purpose not specifically authorized in a writing signed by one of our corporate officers.

12. **PATENT INFRINGEMENT**

(a) We make no express or implied warranties of non-infringement with respect to the Equipment. We will, however, defend, indemnify and hold you harmless from any third party apparatus claims based upon an issued U.S. patent to the extent such claim relates to the Equipment supplied and sold to you; provided, however, that we undertake no indemnification in respect of third-party rights (i) where the alleged patent infringement is based upon or related to any method, process or design claims in third-party U.S. patents, any combination of the Equipment with other equipment not supplied by us, or any modifications of the Equipment made by you and not approved by us, or (ii) to the extent the alleged infringement is directly attributable to the negligence or intentional misconduct of you or otherwise for which you are obligated to indemnify us for under paragraph 12(c).

(b) We shall assume defense of a claim at our expense in accordance with these Terms and Conditions, provided you shall notify us within 30 days of your receipt of notice of an alleged third-party claim that you believe would entitle you to patent infringement indemnification pursuant to paragraph 12(a). You acknowledge and agree that we shall have the sole right to settle or otherwise compromise such a third-party claim, including but not limited to the right to either (i) modify the Equipment to avoid infringement if you are agreeable to the modification, (ii) repurchase the Equipment from you at a price equal to the then-current fair market value of the Equipment, or (iii) secure rights by assignment or license to permit continued use of the Equipment.

(c) If a third party charges us with patent infringement relating to Equipment sold by us to you, we shall have the right to either (i) modify the Equipment to avoid infringement if you are agreeable to the modification, (ii) repurchase the Equipment from you at a price equal to the then-current fair market value of the Equipment, or (iii) secure rights by assignment or license to permit continued use of the Equipment. If a third party charges us with patent infringement on the bases set forth in paragraph 12(a)(i) or (ii), you shall indemnify and hold us harmless for all expenses as well as any awards of damage assessed against us, and, without limiting any of our other rights and remedies available at law or in equity, we shall also have the right to modify or repurchase the Equipment or to secure rights for continued use by way of assignment or license as set forth in this paragraph.

13. **INSPECTION**: Upon prior written notice, you may make reasonable inspections of Equipment at our facility. We reserve the right to determine the reasonableness of the request and to select an appropriate time and location for such inspection. You agree to execute appropriate confidentiality provisions upon our request prior to visiting our facility. All costs of inspection shall be solely determined by us and shall be payable by you. No inspection or expediting by you at the facilities of our suppliers is authorized.

14. **SOFTWARE PROVISIONS**: If software is provided hereunder (whether such is integrated into the Equipment or otherwise operates alongside the same), you are hereby granted a non-exclusive, non-sublicensable, non-transferable, royalty free license to access and use such software as provided and as intended with our Equipment. Without limiting the foregoing, under the foregoing license you may specifically: (i) use our software in machine readable object code only and only with the Equipment provided; (ii) copy our software into any machine readable object code form solely for back up purposes in support of your use of our software on the Equipment provided in accordance with these Terms and Conditions; and (iii) create one additional copy of the software for archival purposes only. This license may only be assigned, sublicensed or otherwise transferred by you with our prior written consent. You hereby recognize and acknowledge that the software provided to you hereunder comprises valuable trade secret and/or copyright property of Alfa Laval (or its licensors) and you covenant that you will take adequate precautions against access to the software by, or disclosure of the software to, anyone not authorized hereunder to use or have access to the software as contemplated herein. The software is subject to the confidentiality obligations set forth below in paragraph 15.

15. **CONFIDENTIALITY:** Subject to any non-disclosure or confidentiality agreement already in effect between us, any drawings, data, software or other information exchanged between us is proprietary or confidential to us and shall not be used or disclosed by you without our prior written consent. Confidential information shall not be any information that (i) is known previously to you under no obligation of secrecy; (ii) becomes known to the public through no breach of an obligation of secrecy by you; or (iii) is independently developed by you without use or reference to any of the confidential information or materials provided to you by us.

16. **INAPPLICABILITY OF CISG:** The parties specifically agree that the United Nations Convention on Contracts for the International Sale of Goods shall not apply to any sale or order or the contract between us.

17. **GOVERNING LAW & VENUE**: These Terms and Conditions and any dispute or claim arising out of or related to an order or the contract between us shall be finally decided in accordance with the laws of the Commonwealth of Virginia, without giving effect to the provisions thereof relating to conflict of laws. You agree that the venue for any such dispute shall lie in the United States District Court for the Eastern District of Virginia, Richmond Division. In the event that federal jurisdiction cannot be established pursuant to 28 U.S.C. §§ 1331 or 1332, the venue for any such dispute shall lie in the Circuit Court of Henrico County, Virginia. You expressly submit and waive any objection to the sole and exclusive jurisdiction of such courts.

18. **GENERAL:** All previous agreements or understandings between us, either oral or written, with regard to the subject order, with the exception of a pre-existing non-disclosure agreement between us, are void and these Terms and Conditions constitute the entire agreement between us with respect to the matters addressed herein. Neither of us shall assign an order or contract to which these Terms and Conditions apply without the prior written consent of the other party, which consent shall not be unreasonably withheld. If any provision of these Terms and Conditions is held to be invalid or unenforceable, such holding shall not affect the validity or enforceability of any other provision herein. No waiver by either of us of any default or breach by the other party will operate as or be deemed a waiver of any subsequent default or breach.

TERMS & CONDITIONS	
DELIVERY:	Drawings submitted 10 to 12 weeks after receipt of a Purchase Order. Equipment delivery 18 to 24 weeks after receipt of approved drawings. The durations provided are estimated and will be re-evaluated at time of contract based on current engineering and shop loading.
BUDGET PRICING:	$171,000.00
TERMS:	15% with drawing submittal, net 30 35% after receipt of approval drawings, net 30 50% invoiced at shipment, net 30
CANCELLATION CHARGES:	10 % - Up to 30 days after receipt of Purchase Order 15 % - 31 – 70 days after Purchase Order 35% - After release for Purchasing 75% - up to 30 days after release for Manufacturing 100% - 31 days after release for Manufacturing
TAXES:	This quotation does not include sales, use, or transportation taxes. These taxes are the responsibility of the Purchaser.
NOTE:	Shipments delayed by the Purchaser for more than one year from purchase order date are subject to billing at the prevailing rate, unless specifically addressed elsewhere in this proposal.
	Due to limited storage space CHEMCO is unable to store the equipment beyond the scheduled shipping date. CHEMCO will invoice for the equipment based on the original schedule even though the equipment is not shipped, as long as the equipment is ready for shipping. If the Customer's construction site is not prepared to receive the equipment on the schedule ship date, **then the Customer must designate an alternate site**. CHEMCO will then ship the equipment to the designated alternate site. • If the Customer does not designate an alternate

TERMS & CONDITIONS	
	site at least one week prior to the scheduled ship date, then CHEMCO will choose a storage facility and inform the Customer of the selection and the associated costs. The Customer will be billed for the following charges: • Labor & materials for long-term horizontal storage, • Freight from CHEMCO to a Subcontractor's storage facility, • Subcontractor's storage fee, • Crane rental to load and unload the equipment, • CHEMCO shipper's labor to arrange for storage, • Labor to clean the equipment & to put it in "as new" condition when the Customer is ready for delivery. These charges will be billed to the Customer "at cost".
START-UP/SUPERVISION:	CHEMCO start-up will be limited to installation checkout and operator instruction. This service will be performed after the equipment is installed, utilities are connected and the chemicals are on hand. Three (3) 8-hour days and one (1) trip total included for start-up assistance. If requested, additional start-up service will be provided at the per diem rate of $1,250 plus living and travel expense.
WARRANTY:	CHEMCO will warrant the system for twelve (12) months from initial operation, not to exceed eighteen (18) months from shipment. This will be limited to the supply of parts and materials only. Defective parts must be returned to CHEMCO for inspection and evaluation. Parts, which fail due to abnormal operating conditions, which were not known at the time of bid or system design, are not covered under this warranty. **Consequential damages as a result of equipment failure are excluded from this warranty. Wear parts are not included in warranty. This is an equipment only warranty**

EQUIPMENT SCOPE		
ITEM	**QUANTITY**	**DESCRIPTION**
01	1	Bag Dump Station • Surge hopper, 6 ft^3 • integral grid w/ bag splitter • Electric vibrator, 120/1/60 **Shipped loose field installed by others.**
02	1	Dust Collector • 60 ft^2 polyester media • Aluminum blower, 3/4 HP, 120/1/60 motor. **Shipped attached to Dump Station**
03	1	Screw Feeder • Ultra-high polyethylene outer tubing • Flat wire configurational spiral • 316 stainless steel screw • 1 hp invertor duty motor with VFD • Design feed rate of 30 lb/hr (30lb/ft^3 hydrated lime) **Field installed by others**
04	1	Pugmill • 530 lb/hr dual shaft pug mill mixer thru-put design • 5 HP, 1,800 RPM, 480V, 60 Hz, 3 phase, inverter duty motor w/ carbon steel motor mount • V-belt drive assembly w/ spur gears and OSHA guard • 1.4 service factor gear reducer • Carbon steel mixer housing construction • (2) 4" shaft w/ (4) rows of adjustable paddles each • 12" agitator diameter • Pillow block bearings on drive and idle end of mixer • 7 gage carbon steel cover • Flanged inlet box • Plain end discharge box **Shipped loose for field installation by contractor**

EQUIPMENT SCOPE		
ITEM	**QUANTITY**	**DESCRIPTION**
SERVICES AND ITEMS NOT INCLUDED IN CHEMCO'S PROPOSAL: • Unloading • Erection • Installation • Design or supply of anchor bolts • Design or supply of concrete foundations • Hook-up of utilities • Supply of chemicals • Supply of any other materials or services unless specifically mentioned above		

VELOBLEND

Advanced Liquid Polymer Activation Technologies

The result of over 30 years pursuing optimum polymer performance and system reliability.

AS IT TURNS OUT, IT IS POSSIBLE TO PATENT "AND"

While the rest of the polymer equipment industry was engaged in a mechanical versus non-mechanical system debate, VeloDyne developed the next generation of advanced polymer activation technologies, a hybrid of the two approaches.

VELODYNE

A company driven to deliver the very best Polymer Blending, Chemical Feed, and Bulk Solids Handling Systems, fueled by constantly asking, "What If?"

VELOBLEND

Advanced Liquid Polymer Activation Technologies

OPTIMIZING LIQUID POLYMER PERFORMANCE

There have been numerous technologies introduced over the last thirty years designed to activate liquid polymer. The advanced hybrid VeloBlend™ technology has proven to more efficiently induce ultra-high, non-damaging mixing energy, delivering the highest polymer performance over any other technology in the industry.

The VeloBlend is simply the best polymer activation technology ever developed.

—polymer consultant with over 30 years of industry experience

NEAT "AS-SUPPLIED" POLYMER

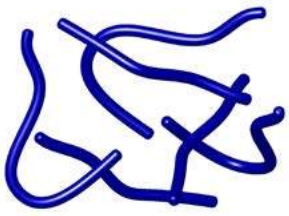
Neat polymer, as supplied, is primarily comprised of coiled-up polymer, oil, water, and inverting surfactant.

UNACTIVATED POLYMER MOLECULE—CAPABLE OF WITHSTANDING HIGH MIXING ENERGY

In its "neat" (as-supplied) state, the polymer is coiled up like a spring and is capable of withstanding ultra-high mixing energy without damage to its molecular structure.

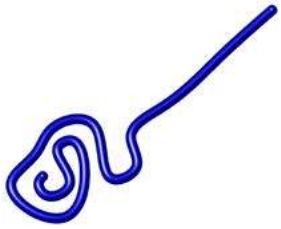
DAMAGED POLYMER—CAUSED BY EXCESSIVE SHEAR

Once the polymer uncoils, the elongated polymer is now susceptible to damage caused by excessive shear. The result is increased polymer usage, increased polymer cost and reduced process performance.



PARTIALLY UNCOILED POLYMER-INSUFFICIENT MIXING ENERGY

If polymer is exposed to insufficient mixing energy, the polymer fails to fully activate with the same negative results in polymer cost and process performance as is seen with damaged polymer.



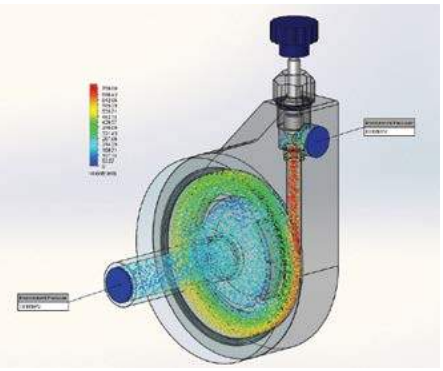
FULLY ACTIVATED, UNDAMAGED POLYMER—DELIVERING OPTIMAL PERFORMANCE

When neat, coiled-up polymer is properly exposed to ultra-high mixing energy, the oil is effectively "scrubbed" from the polymer, allowing it to become highly activated without damage.

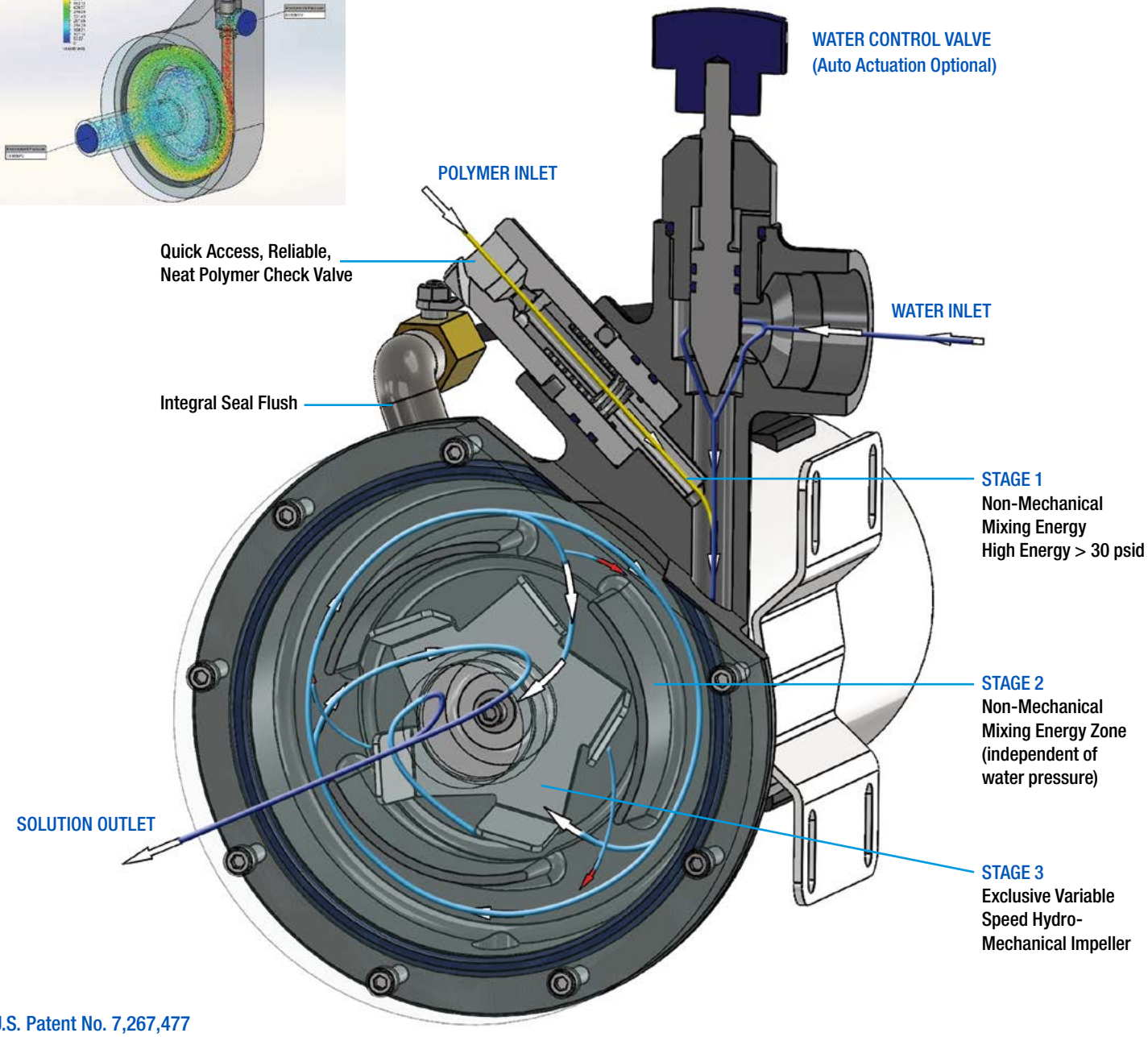
The VeloBlend's hybrid technology more effectively induces ultra-high, non-damaging mixing energy over the system's full flow range than any other technology on the market.

EXCLUSIVE HYBRID ACTIVATION TECHNOLOGY

We started by perfecting hydro-dynamic, non-mechanical mixing energy. Born from thirty years of experience, the VeloBlend VH series optimizes the use of non-mechanical mixing energy, exceeding the performance and reliability over existing technologies.



We then eliminated the biggest drawback to non-mechanical blending—its reliance on water pressure. The VeloBlend™ hybrid polymer activation technology combines the reliability of hydro-dynamic, non-mechanical mixing energy with controllable, variable speed hydro-mechanical mixing energy. This process allows for precise control of mixing conditions, allowing optimal performance of any polymer available.



U.S. Patent No. 7,267,477

VELOBLEND

Advanced Liquid Polymer Activation Technologies

THE VERSATILE VELOBLEND SYSTEM

1. **ACTIVATION CHAMBER**
   VeloBlend Advanced Liquid Polymer Activation Technology delivers unsurpassed performance and reliability.

2. **DILUTION WATER SYSTEM**
   Up to 600 GPM to meet your application requirements.

3. **NEMA 4X CONTROLS**
   Five standard control systems are available to meet your specific control requirements.

4. **NEAT POLYMER PUMP**
   Progressive cavity pumps standard. Other pump types optional.

5. **RUGGED STAINLESS STEEL SKID**
   Available in 304 or 316 stainless steel. Open design for ease of maintenance. Designed to provide ideal pump suction conditions.

SERIES 6000

- Skid Configuration #2
- Progressive Cavity Pump
- Range: from 0.2 up to 100 GPM Solution
- Control Levels D thru RpSB

SERIES 2400

- Skid Configuration #1
- Progressive Cavity Pump
- Range: from 0.2 up to 50 GPM Solution
- Control Levels D & E

SERIES 12000

- Skid Configuration #3
- Progressive Cavity Pump
- Range: from 10 up to 200 GPM Solution
- Control Levels D thru RpSB

SERIES 36000

- Skid Configuration #4
- Progressive Cavity Pump
- Range: from 40 up to 600 GPM Solution
- Control Levels D thru Rw

	BASE MODEL	CONTROL LEVEL	PLC/HMI OPTION	POWER	SKID SIZE
Model # Example:	VM-10P-1200	RpSB	3D	A	2
Build Your VeloBlend:	VM-3P-600	D	0	A	1

BASE MODEL:

VELOBLEND BASE MODEL	POLYMER GPH*	WATER GPH**	SKID SIZE BASED ON CONTROL LEVEL (SEE CHART BELOW)				
			D	E	Rw	Rp	RpSB
VM-0.5P-120	0.025 – 0.5	12 – 120	1		2		
VM-2P-300	0.1 – 2	30 – 300					
VM-3P-600	0.15 – 3	60 – 600					
VM-5P-1200	0.25 -5	120 – 1200					
VM-10P-1800	0.5 – 10	180 – 1800					
VM-15P-2400	0.75 – 15	240 – 2400					
VM-30P-6000	1.5 – 30	600 – 6000	2				
VM-60P-12000	3.0 – 60	1200 – 12000	3				
VM-180P-36000	18 – 180	3600 – 36000	4				

*LOWER CAPACITIES AVAILABLE—CONSULT FACTORY **ALTERNATE PUMP/WATER RATE COMBINATIONS AVAILABLE—CONSULT FACTORY *** CAPACITIES SUBJECT TO CHANGE

CONTROL LEVEL:

STANDARD CONTROL OPTIONS	CONTROL LEVELS				
	DISCRETE		PLC		
	D	E	Rw	Rp	RpSB
LOCAL & REMOTE START/STOP DISCRETE INPUT	●	●	●	●	●
4-20mA PUMP PACING ANALOG INPUT	●	●	●	●	●
4-20mA SOLIDS DENSITY ANALOG INPUT					●
SYSTEM RUNNING DISCRETE INPUT	●	●	●	●	●
SYSTEM IN REMOTE DISCRETE INPUT	●	●	●	●	●
PUMP RATE ANALOG OUTPUT		●	●	●	●
SOLUTION RATE ANALOG OUTPUT				●	●
COMMON ALARM DISCRETE INPUT	●	●	●	●	●
MANUAL WATER RATIO CONTROL			●		
AUTO WATER RATIO CONTROL				●	●
SMARTBLEND™ RATIO CONTROL					●
ETHERNET COMMUNICATION				●	●

SEE PLC/HMI OPTIONS BELOW

OTHER CONTROL OPTIONS AVAILABLE—CONSULT FACTORY

PLC/HMI OPTION:

PLC OPTIONS		COLOR TOUCHSCREEN HMI OPTIONS						
		C-MORE		ALLEN BRADLEY			MAGELIS	
		8”	10”	7”	10”	12”	7”	10”
		A	B	C	D	E	F	G
VELODYNE CONTROLLER	1	INTEGRAL 6” COLOR TFT TOUCHSCREEN						
ALLEN BRADLEY MICROLOGIX	2	●	●	●	●	●		
ALLEN BRADLEY COMPACTLOGIX	3	●	●	●	●	●		
MODICON MOMENTUM	4	●	●				●	●

OTHER PLC/HMI OPTIONS AVAILABLE—CONSULT FACTORY

POWER OPTION:

A	120V / 1PH / 60Hz*
B	240V / 1PH / 60Hz
C	240V / 3PH / 60Hz
D	480V / 3PH / 60Hz
E	600V / 3PH / 50Hz

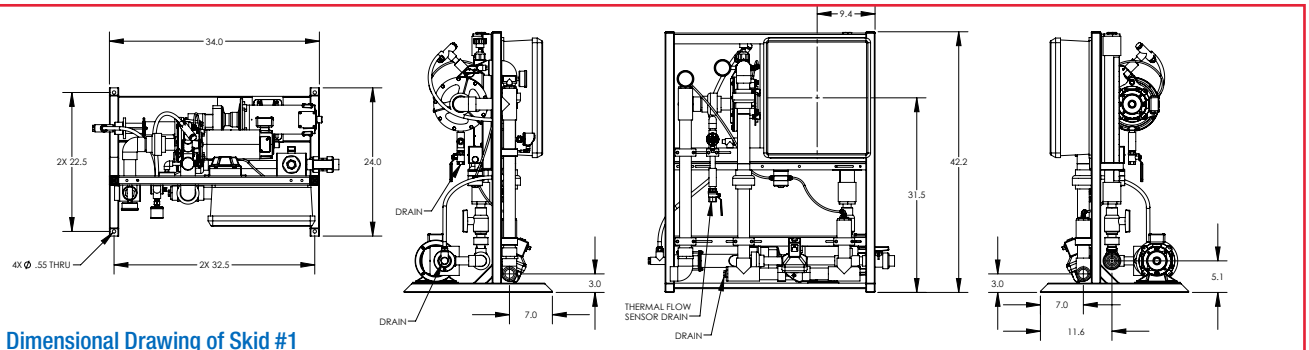
*NOT AVAILABLE FOR 200 GPM WATER AND ABOVE

SKID SIZE:

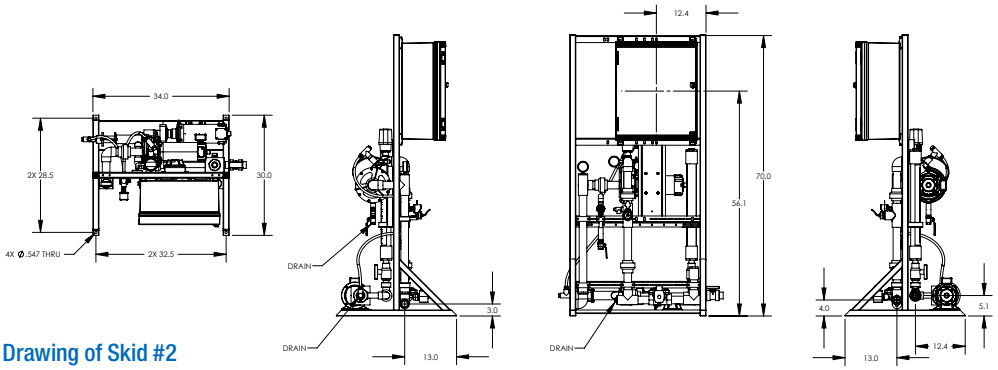
		WIDTH	DEPTH	HEIGHT
1	CONFIGURATION 1	34”	24”	42”
2	CONFIGURATION 2	34”	30”	72”
3	CONFIGURATION 3	48”	36”	72”
4	CONFIGURATION 4	?	?	?

STANDARD CONTRUCTION 304SS, AVAILABLE IN 316SS

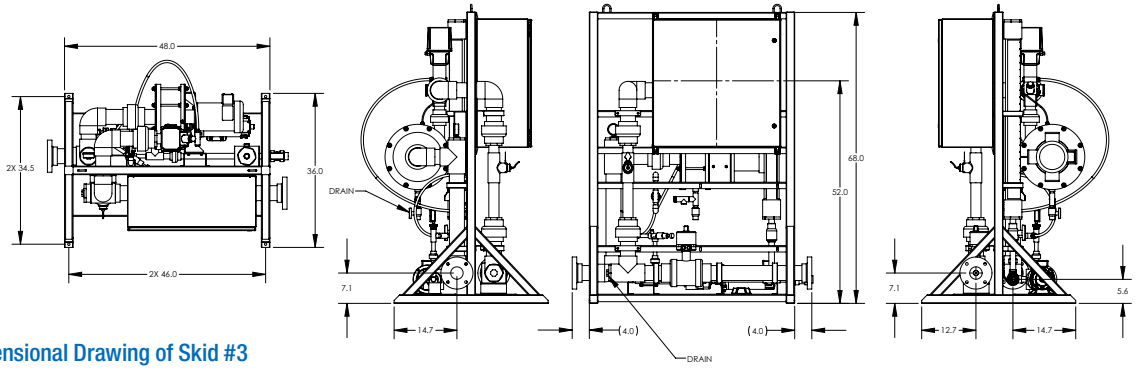
VELOBLEND SYSTEM DIMENSIONS



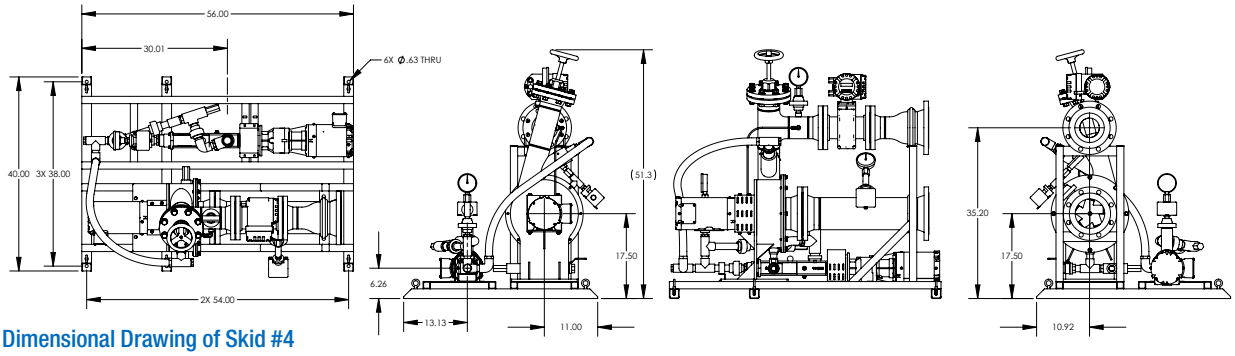
Dimensional Drawing of Skid #1



Dimensional Drawing of Skid #2



Dimensional Drawing of Skid #3

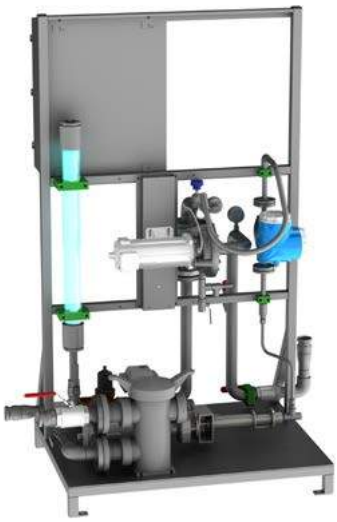


Dimensional Drawing of Skid #4

Note: drawings are for reference use only. Dimensions and designs are subject to change.

VELOBLEND HEAVY INDUSTRIAL

The VeloBlend industrial series is designed for the rigors of the pulp & paper, oil & gas, mining, and other demanding industries and applications.



VELOBLEND INDUSTRIAL SERIES FEATURES:

- Ratio control of polymer and water
- VeloBlend Stainless Mixing Chamber
- All stainless steel welded plumbing
- Magnetic flow meter for water flow
- Coriolis mass flow meter for neat polymer
- Skid mounted neat polymer strainer (simplex or duplex available)
- Heavy Ddty stainless steel skid

POLYMER PROCESSING PLANTS

VELOBLEND

Advanced Liquid Polymer Activation Technologies

VELODYNE – THREE DECADES OF EXPERIENCE

For over thirty years our team has been dedicated to excellence. Through knowledge gained from thousands of installations worldwide, VeloDyne unites proven technologies with unsurpassed experience. Contact us to learn how our products and services can help optimize your treatment process.

MORE PROVEN SOLUTIONS FROM VELODYNE

Dry Polymer Activation

Auger Feeders & Conveyors

Manual Bag Systems

Liquid Chemical Metering & Feed Systems

Bulk-Bag Systems

Lime Slakers

Containerized Systems

Silo Systems

VELODYNE

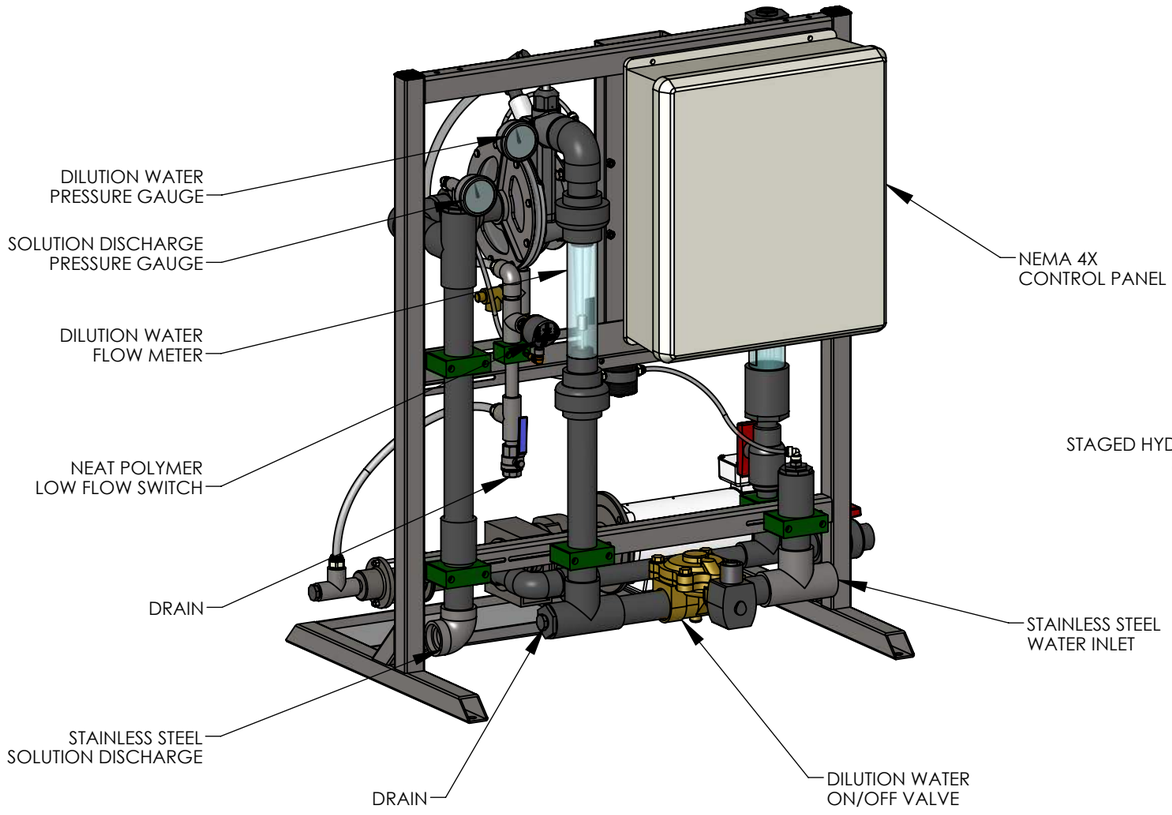
VeloDyneSystems.com UL® 508A

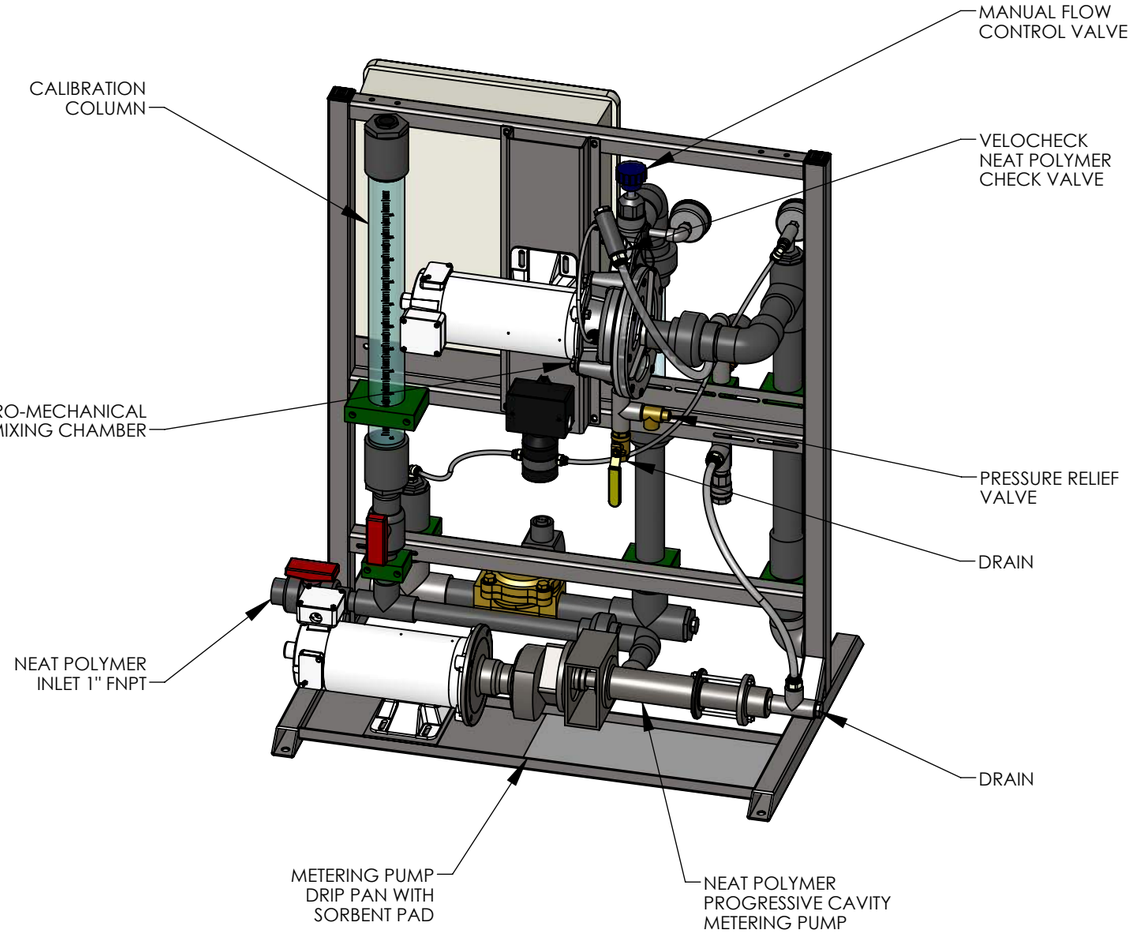
VeloDyne.1014.0918

Phone: 303-530-3298
E-Mail: Sales@VeloDyneSystems.com

WATER FLOW MAX	CONNECTION SIZE
1200 GPH	1" FNPT
2400 GPH	1.5" FNPT

NOTE: Drawings are for general layout use only. See proposal for details of the proposed scope of supply."





NOTES -

1) APPROXIMATE DRY WEIGHT 275 LBS

2) FOLLOW O&M PROCEDURES FOR DRAINING PRIOR TO STORAGE OR SHIPMENT

3) FRAME MATERIAL IS 304 SS AND HARDWARE IS 18-8 SS UNLESS OTHERWISE NOTED

NOTE: DRAWINGS ARE FOR GENERAL LAYOUT USE ONLY.
SEE PROPOSAL FOR DETAILS OF THE PROPOSED SCOPE OF SUPPLY.

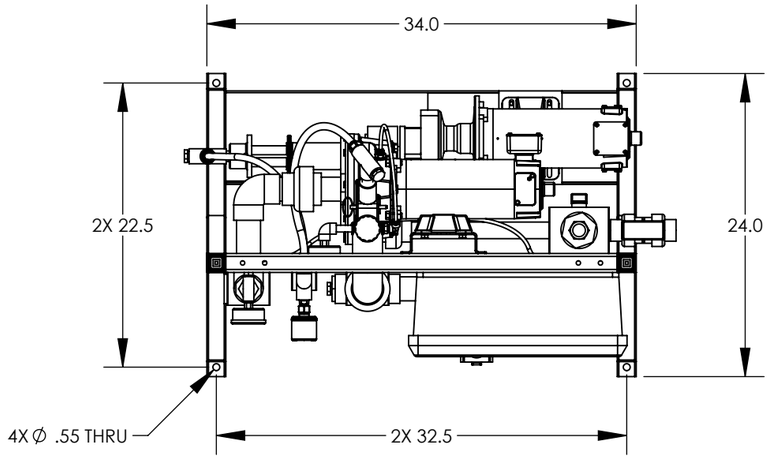
VELODYNE

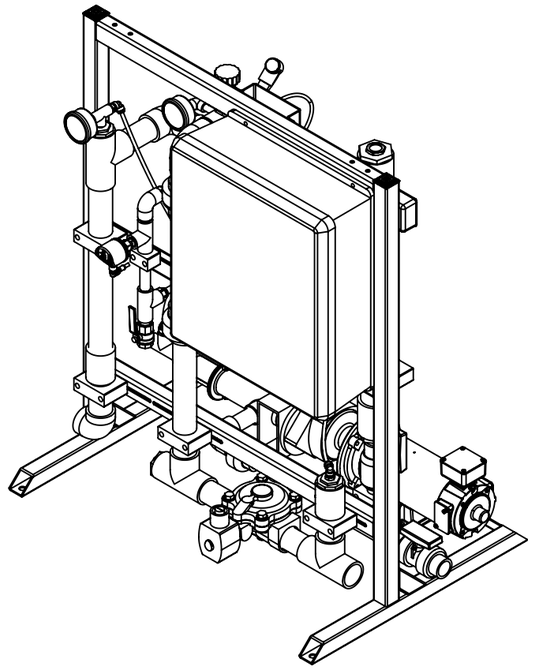
VELOBLEND SALES DRAWING,
SERIES 2400, D&E CONTROLS

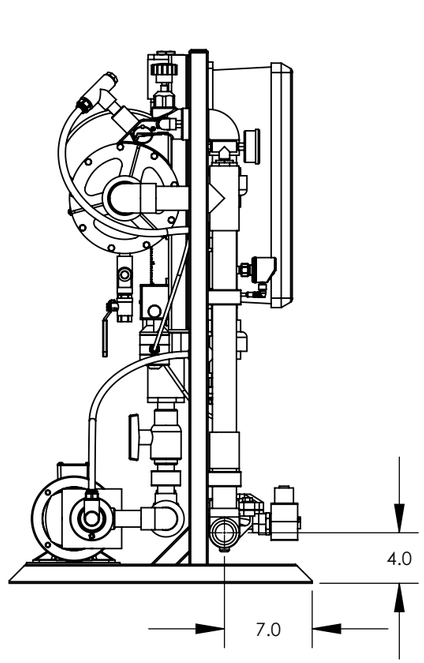
SIZE	DWG. NO.	REV.
B	VM-P-2400-D&E-0-A-1	A

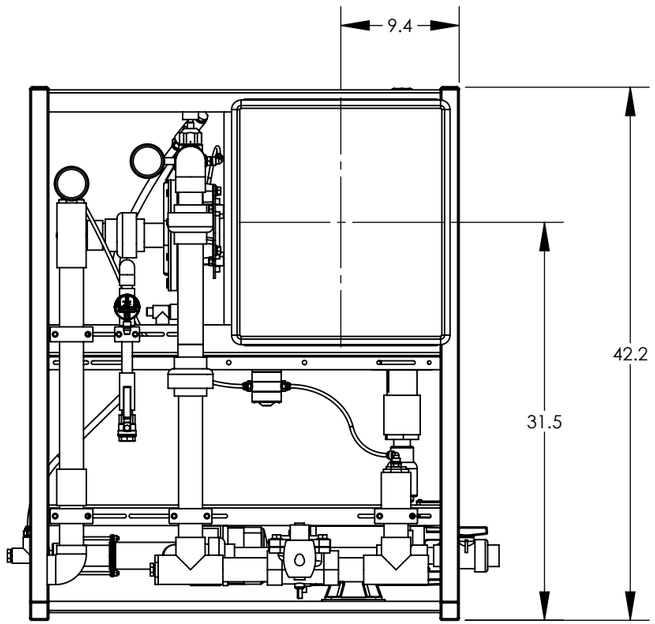
SCALE 1:10 DO NOT SCALE DRAWING SHEET 1 OF 2

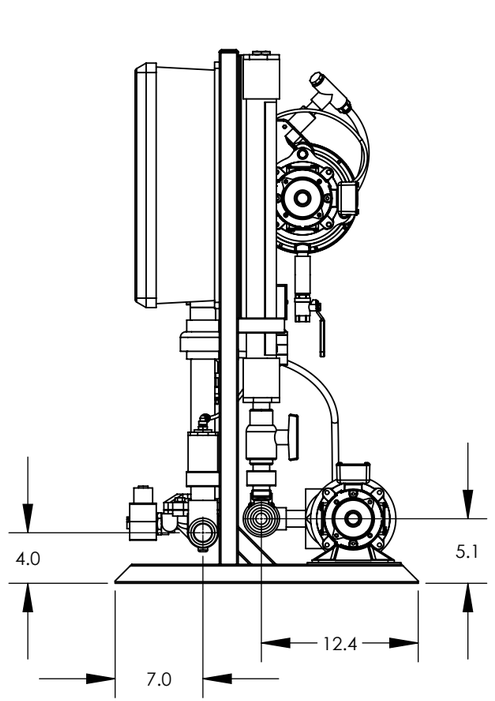
NOTE: Drawings are for general layout use only. See proposal for details of the proposed scope of supply."











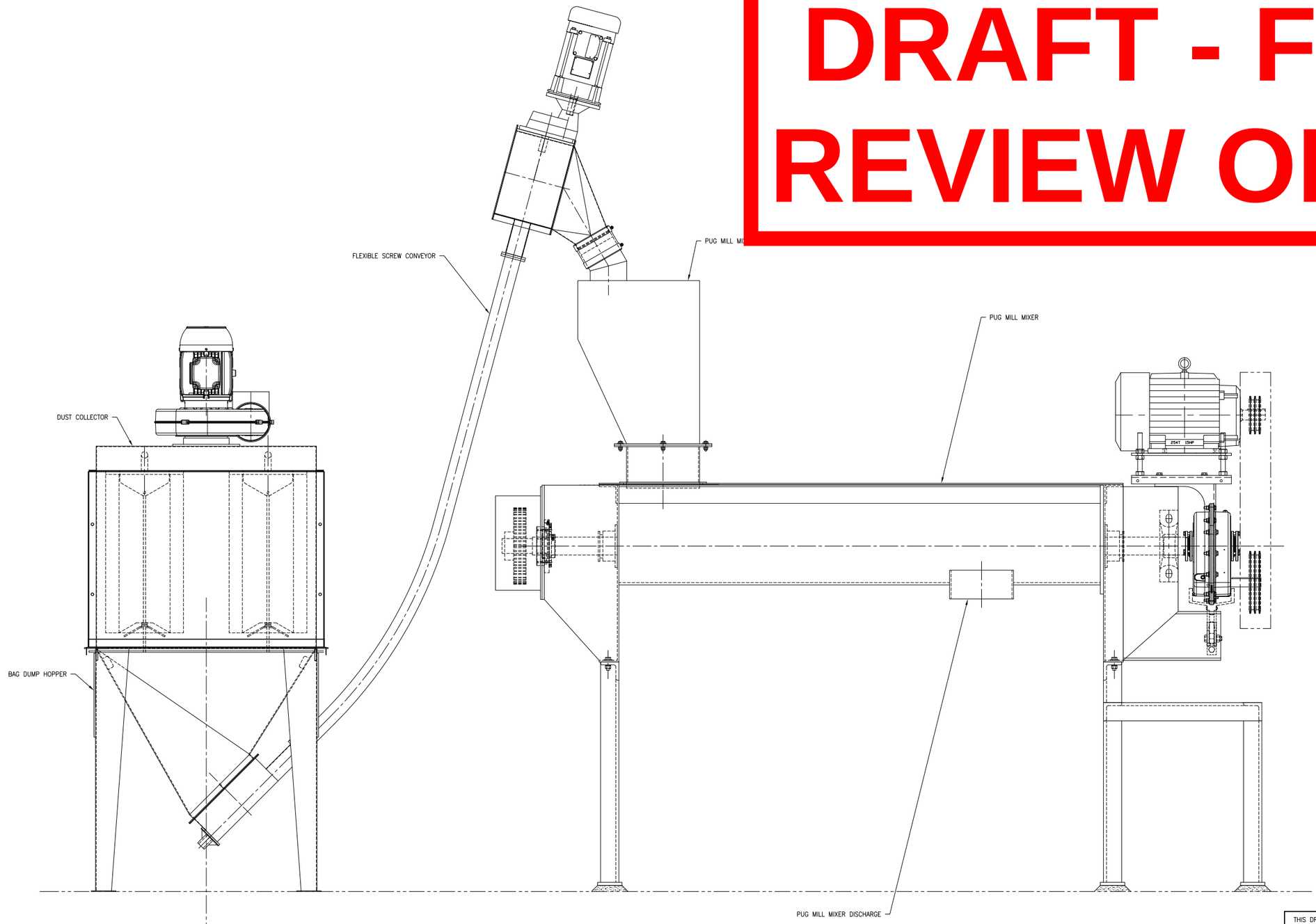
NOTE: DRAWINGS ARE FOR GENERAL LAYOUT USE ONLY.
SEE PROPOSAL FOR DETAILS OF THE PROPOSED SCOPE OF SUPPLY.

VELODYNE

VELOBLEND SALES DRAWING,
SERIES 2400, D&E CONTROLS

SIZE	DWG. NO.	REV.
B	VM-P-2400-D&E-0-A-1	A
SCALE 1:12	DO NOT SCALE DRAWING	SHEET 2 OF 2

DRAFT - FOR REVIEW ONLY



PROPOSED GENERAL ARRANGEMENT ELEVATION

CHEMCO SYSTEMS, L.P.

DATE	REV	BY	REMARKS
1/15/21	0	GK	INITIAL ISSUE

SCALE: 1 1/2" = 1'-0"
DATE: JANUARY 15, 2021
DRAWN BY: G. KUNDRAT

CHEMCO SYSTEMS, L.P.
1500 INDUSTRIAL DRIVE MONONGAHELA, PA

SHT. DESCRIPTION: PROPOSED GENERAL ARRANGEMENT

DWG. DESCRIPTION: SLUDGE STABILIZATION EQUIPMENT WEST UNION, WV

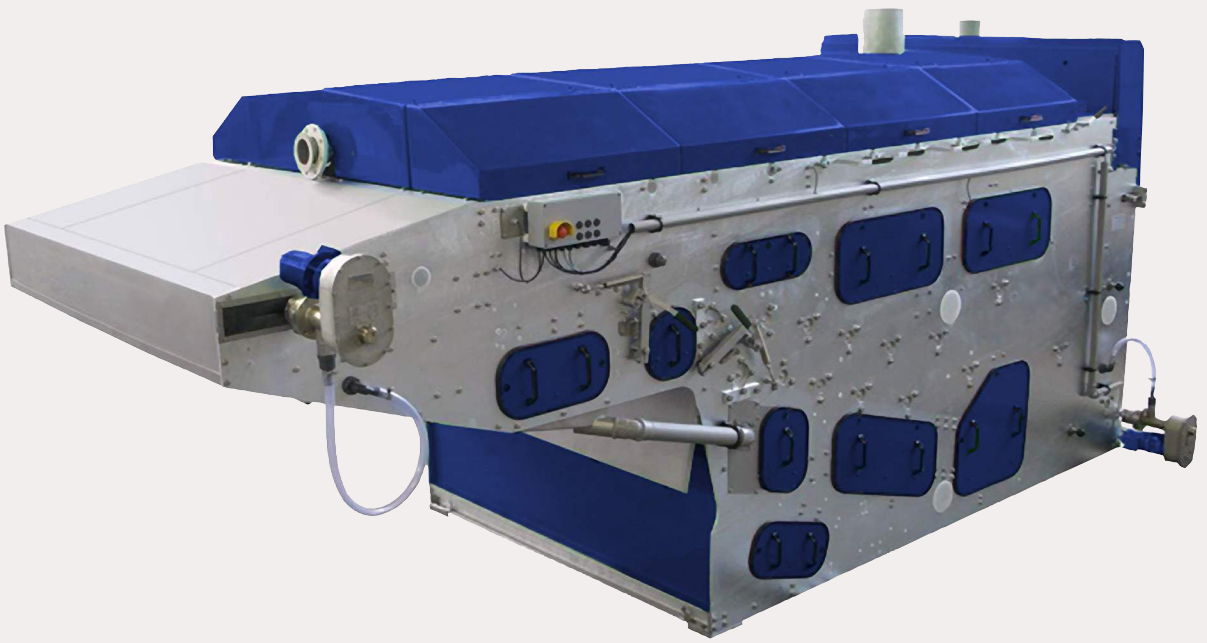
CHECKED BY:
APPROVED BY:

D | DWG NO.: P011521

SHEET NO. 1

Alfa Laval AS-H Winklepress WPN belt filter press

Sludge dewatering machine



Application

The next generation Alfa Laval AS-H Winklepress WPN belt filter press sets a new industry standard for dewatering today's municipal and industrial wastewater. The unit does exceptionally well with dewatering gelatinous MBR (membrane bioreactor) and BNR (biological nutrient removal) sludges.

Features

The Alfa Laval AS-H Winklepress WPN produces higher dry solids than previous models due to the optimized roller configuration and longer belt path, which together provide a 4% increase in dewatering area. The result is a more gradual and longer press time that achieves higher final dry solids content. Flocculant costs are also reduced due to the gradual pressure process.

The unit also features an upgraded motor that achieves approximately 6% lower energy consumption, which also saves in CO_2 emissions and energy costs. And the enclosed design reduces odor emissions – a popular choice by wastewater plants in more heavily populated areas.

Benefits

- Ideal for applications where the highest dry solids are required
- Low power requirement
- Low polymer cost
- Long product life cycle
- Easy to upgrade in the field with additional pressure zone rollers
- Consistent cake dryness at high throughput

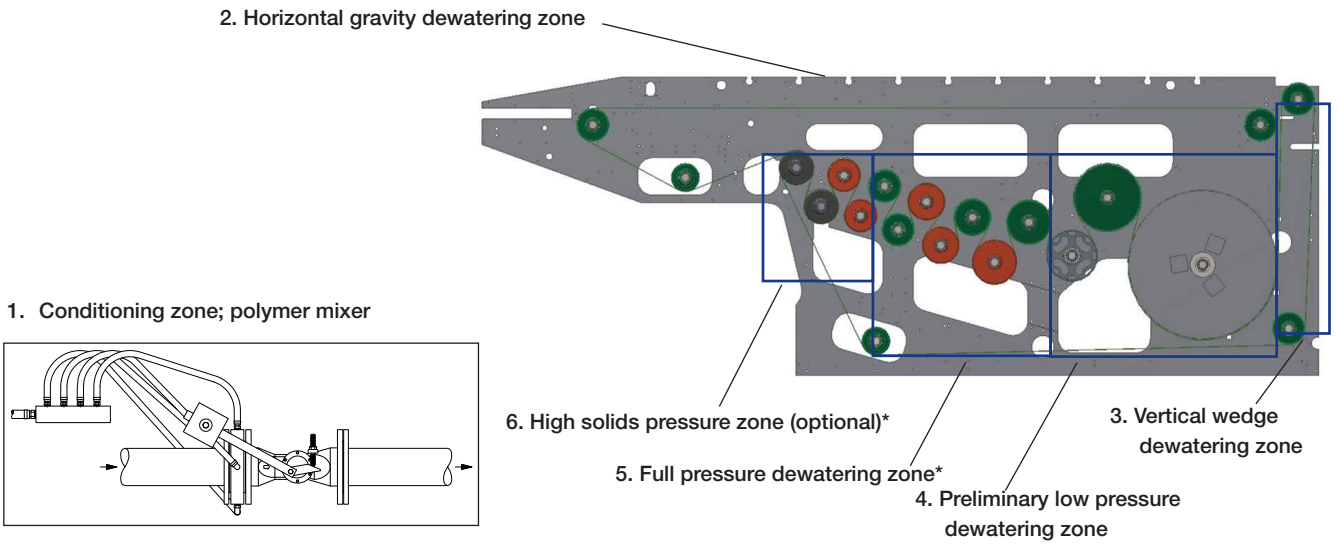
Configurations

- Available with high solids pressure zone to provide maximum cake dryness
- Extended gravity deck is available for dilute sludges

Ashbrook Simon-Hartley

Working principle – optimized zone approach

There are six key zones that allow the new Winklepress WPN to optimize the dewatering process:



1. **Conditioning zone** – optimized dewatering begins with the proper conditioning of the slurry. Each unit is equipped with a proprietary variable orifice in-line polymer mixer that combines polymer and slurry instantly to facilitate rapid flocculation. This design allows the unit to use the lowest dosage of polymer while achieving the highest cake solids.

2. **Horizontal gravity dewatering zone** – multiple rows of chicanes and the belt support grid system quickly removes excess liquids. The chicanes continuously turn the sludge over, freeing up entrapped liquid, and creating an open area to allow the entrapped water to exit to the dewatering belt. The grid system supports the belt, while creating a wiping action on the bottom of the belt to enhance drainage rates. Extended gravity zones are available for more dilute slurries.

3. **Vertical wedge dewatering zone** – allowing for dewatering through both belts as they converge, the system is spring loaded and fully adjustable, even while the machine is in operation.

4. **Preliminary low pressure dewatering zone** – occurring at the dandy roller (a specially designed perforated roller with internal scoops that aids with filtrate removal), a gradual buildup of pressure on the sludge begins, preparing the process for the full pressure zone.

5. **Full pressure dewatering zone*** – pressure levels gradually increase as the sludge moves between the two belts. By progressively reducing the roller diameters, the shear effect and pressure is accelerated. As the amount of pressure applied to the sludge between the dewatering belts increases, the shear action acts to break the cake structure and expose fresh areas to surface pressure. The end product is a uniformly dry sheet of cake that discharges from the machine.

6. **High solids pressure zone (optional)*** – designed to provide maximum cake dryness, this section increases the time under pressure and adds shear to deliver approximately a 10 – 20% dryer cake.

**Zones five and six are upgraded from previous models with select larger diameter rollers (shown in red) that provide longer press time, resulting in higher final dry solids content.*

Performance features

- The Alfa Laval AS-H Winklepress WPN is fitted with lifetime rated bearings. Each bearing is protected from contaminates with a triple labyrinth seal and specially designed shaft mounted splash guards. Lubrication is only required every six months of operation time.

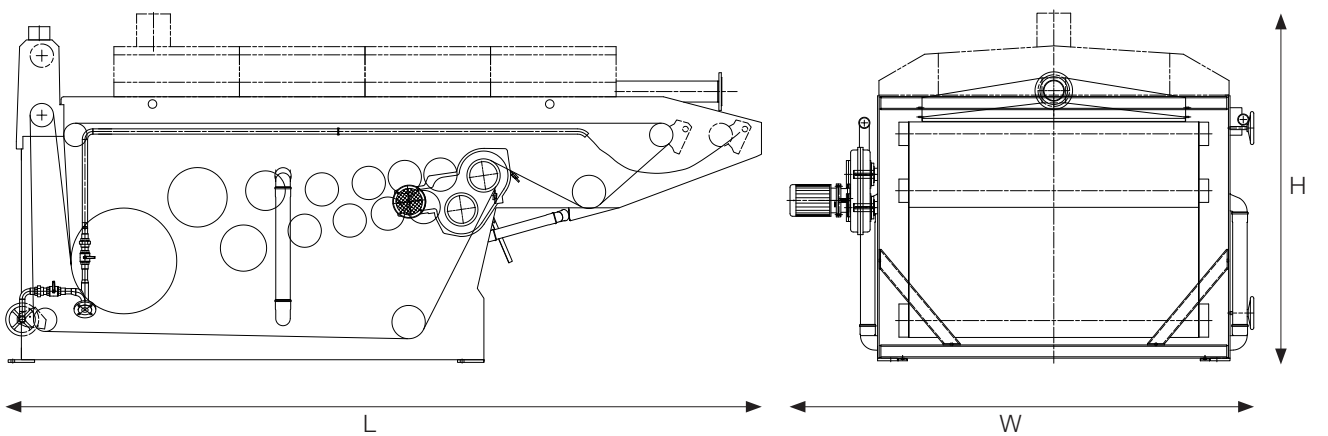
- Featuring a fully live belt alignment and tensioning system, the unit incorporates a pressure compensated variable flow pump. This advanced system only requires a 3.8 liter (1 gallon) fluid reservoir. The entire system comes mounted to the machine pre-piped and pre-wired – eliminating civil work and the need to run any additional lines.

- The sludge/polymer mixer valve used instantly combines the polymer and slurry. This non-clog, static mixer is known for its mixing precision and adjustable throat, which allow direct control of mixing energy. The design optimizes polymer effectiveness and minimizes polymer consumption.

- The Alfa Laval AS-H Winklepress WPN design and drain pan configurations simplify cleanup procedures and increase access to key areas. Clean operation is enhanced by the patented scraper blade design that places even edge loading across the blade with springs and operator levers on both ends of the blade. Also, the cake side of the belt never runs against the roller face, minimizing material transfers.

- The shape and location of inspection openings are strategically placed for optimum accessibility and convenient maintenance and cleaning.

- Upper and lower belts are the same length, making spare parts inventory more flexible.



Dimensions

Model	Length		Width		Height	
	mm	inches	mm	inches	mm	inches
1.0	5,600	220	2,476	97	2,695	106
1.5	5,600	220	3,020	119	2,695	106
2.0	5,600	220	3,520	139	2,695	106

**Dimensions of standard WPN and WPN with optional high solids pressure zone are the same. Weights will vary.*

How to contact Alfa Laval
Contact details for all countries are continually updated on our website. Please visit www.alfalaval.com to access the information directly.

PROPOSED LAYOUT

&

OPINION OF PROBABLE COST

Engineers Opinion of Probable Cost

City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
General Sitework					
Mobilization / Demobilization	1	**LS**	$ 100,000.00	**$/LS**	$ 100,000.00
Video Taping of Project Area	1	**LS**	$ 20,000.00	**$/LS**	$ 20,000.00
Excavation & Site Grading	1	**LS**	$ 175,000.00	**$/LS**	$ 175,000.00
Erosion and Sediment Control	1	**LS**	$ 20,000.00	**$/LS**	$ 20,000.00
Seeding and Mulching of Disturbed Areas	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
Primary Influent Treatment Modifications					
Associated Process Piping Modifications	1	**LS**	$ 40,000.00	**$/LS**	$ 40,000.00
Strainpress/Sludge Screen (Huber SP 290)	1	**EA**	$ 140,000.00	**$/EA**	$ 140,000.00
Primary Sludge Pump Upgrades	1	**LS**	$ 80,000.00	**$/LS**	$ 80,000.00
New Strain Press Installation Cost	1	**LS**	$ 42,000.00	**$/LS**	$ 42,000.00
Anaerobic Digester New Steel Floating Covers					
New Vertical Guided Steel Digester Cover (Ovivo 40 G1VF), Complete	2	**EA**	$ 162,000.00	**$/EA**	$ 324,000.00
New Digester Cover Installation Cost	2	**EA**	$ 48,750.00	**$/EA**	$ 97,500.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Removal & Disposal of Existing Digester Covers	2	**EA**	$ 15,000.00	**$/EA**	$ 30,000.00
LM™ Mixer Option					
New LM™ Linear Motion Mixer (Ovivo LM12/7.5/72), Complete	2	**EA**	$ 190,000.00	**$/EA**	$ 380,000.00
New LM™ Mixer Installation Cost	2	**EA**	$ 25,000.00	**$/EA**	$ 50,000.00
Internal Digester Piping Modifications & Supernatant Screen Relocation	1	**LS**	$ 100,000.00	**$/LS**	$ 100,000.00
Removal and Disposal of Sludge and Debris from Existing Digesters	50	**DT**	$ 900.00	**$/DT**	$ 45,000.00
Heat Exchanger Replacement - Water to Sludge					
Process Piping Modifications (Valves & Piping)	1	**LS**	$ 25,000.00	**$/LS**	$ 25,000.00
New Ovivo 0.76 DDI Heat Exchanger	2	**EA**	$ 110,000.00	**$/EA**	$ 220,000.00
New Heat Exchanger Base (min. 6" High)	3	**CY**	$ 1,300.00	**$/CY**	$ 3,900.00
Installation Cost of New Heat Exchangers	1	**LS**	$ 66,000.00	**$/LS**	$ 66,000.00

WORK ACTIVITY	QUANTITY	UNIT	UNIT PRICE		CONSTRUCTION COST
Solids Handling & Dewatering Equipment					
New Alfalaval 2.0 Meter AS-H Belt Filter Press	1	**EA**	$ 304,800.00	**$/EA**	$ 304,800.00
New Chemco Systems Lime Pugmill and Feeder	1	**EA**	$ 205,200.00	**$/EA**	$ 205,200.00
New Veloedyne Polymer Dosing System	1	**EA**	$ 23,525.00	**$/EA**	$ 23,525.00
Chemical Dosing & Solids Handling Building (50' X 40' X 20')	2,000	**SF**	$ 150.00	**$/SF**	$ 300,000.00
Structual Concrete	100	**CY**	$ 1,300.00	**$/CY**	$ 130,000.00
Associated Piping, Valves, Etc.	1	**LS**	$ 60,000.00	**$/LS**	$ 60,000.00
Electrical, Lighting & HVAC	1	**LS**	$ 100,000.00	**$/LS**	$ 100,000.00
Installation of New Solids Handling Equipment & Chemical Dosing	1	**LS**	$ 160,057.50	**$/LS**	$ 160,057.50
Sludge Storage Building					
Building (50' X 50' X 20' High)	2,500	**SF**	$ 150.00	**$/SF**	$ 375,000.00
Structural Concrete	200	**CY**	$ 1,300.00	**$/CY**	$ 260,000.00
Electrical & Lighting	1	**LS**	$ 20,000.00	**$/LS**	$ 20,000.00
Ventilation	1	**LS**	$ 30,000.00	**$/LS**	$ 30,000.00
Nutrient Removal - Primary Influent & Sidestream CPR					
New Ovivo EloVac Chemical Phosphorus Removal System	1	**EA**	$ 1,500,000.00	**$/EA**	$ 1,500,000.00
New Magnesium Chloride Dosing System	1	**EA**	$ 25,000.00	**$/EA**	$ 25,000.00
Installation of CPR Equipment (Process Piping, Fiberglass Shelter)	1	**LS**	$ 500,000.00	**$/LS**	$ 500,000.00
Alum Feed & Storage System	1	**LS**	$ 50,000.00	**$/LS**	$ 50,000.00

SUBTOTAL	**$**	**6,071,982.50**
Contingency (10%)	$	607,000.00
ESTIMATE OF PROBABLE CONSTRUCTION TOTAL	**$**	**6,679,000.00**
ESTIMATED ENGINEERING FEES (~17.5%)	**$**	**1,168,825.00**
SAY	**$**	**7,847,900.00**

Engineers Opinion of Probable Cost
City of Mount Vernon
WWTP Anaerobic Digester Improvement Project
Prepared by: Civil & Environmental Consultants, Inc.
Prepared on: June 24th, 2021
CEC Project # 310-731

Civil & Environmental Consultants, Inc.
600 Marketplace Avenue
Bridgeport, West Virginia 26330
Phone: 304-933-3119

Project Cost Summary

Total Construction Estimate			**$**	**6,679,000.00**
Study and Report Phase			**$**	**45,000.00**
Design Phase		**8.61%**	**$**	**575,000.00**
Preliminary Design	$ 200,000.00			
Final Design	$ 375,000.00			
Bidding and Negotiation			**$**	**30,000.00**
Construction			**$**	**510,000.00**
Engineering During Construction	$ 185,000.00			
Resident Project Inspection	$ 325,000.00			
Post Construction			**$**	**10,000.00**
Total Technical Fee		**17.52%**	**$**	**1,170,000.00**
Special Services Not Included in ASCE Manual			**$**	**85,000.00**
Geotechnical Engineering/Subsurface Investigation	$ 20,000.00			
Aerial Mapping and Topographic Survey	$ 10,000.00			
Land Surveys and Easement Preparation	$ -			
Environmental Assessment & Review of Permits	$ -			
Preparation of Funding Applications	$ 25,000.00			
Construction Stakeout	$ 10,000.00			
Operation and Maintenance Manuals	$ 10,000.00			
Record Drawings	$ 10,000.00			
Legal Fees			**$**	**25,000.00**
Land and ROWs Attorney				
PSC Attorney	$ 25,000.00			
Administration Fees			**$**	**40,000.00**
Project Administrator	$ 40,000.00			
Project Accountant				
Financing			**$**	**25,000.00**
Bond Counsel/Loan Closing Costs - Private Loan	$ 25,000.00			
Permits			**$**	**30,000.00**
WVDEP - Construction Stormwater Permit	$ 10,000.00			
WVDOH (Permit, Bond)	$ 10,000.00			
WVDHHR - Bureau for Public Health	$ 10,000.00			
Permits			**$**	**-**
Land Acquisition				
Easements				
Total Soft Costs			**$**	**1,375,000.00**
Project Contingency (5%)			**$**	**68,750.00**
ESTIMATED TOTAL PROJECT COST			**$**	**8,122,750.00**

NORTH

SECONDARY TREATMENT UNIT #1

CHLORINE CONTACT TANKS

PROPOSED NEW LINEAR MOTION MIXERS AND NEW ROOF COVERS

WASTE WATER TREATMENT PLANT OFFICE/ADMINISTRATION BUILDING

PROPOSED ELOVAC–P RFP BUILDING

PROPOSED SLUDGE DE–WATERING AND POST LIME STABILIZATION

PROPOSED SLUDGE TRUCK LOADING BAY

SLUDGE HOLDING #1

SLUDGE HOLDING #2

AEROBIC DIGESTION

FINAL CLARIFIER #1

CONTACT ZONE

REAERATION

DIGESTER #1

DIGESTER #2

DIGESTER BUILDING

SCREENING BUILDING

SECONDARY TREATMENT BUILDING

SEPTAGE RECOVERY STATION

PUMP & CONTROL BUILDING

GRIT TANK

SETTLING TANK #1

SETTLING TANK #2

MAINTENANCE BUILDING

CONTACT ZONE

REAERATION

FINAL CLARIFIER #2

AEROBIC DIGESTION

PROPOSED ALUM TANKS

SETTLING TANK #3

SETTLING TANK #4

GARAGE

PRIMARY SLUDGE BUILDING

SECONDARY TREATMENT UNIT #2

PROPOSED BIO–SOLIDS STORAGE BUILDING

COUGAR DRIVE

NOTES

1. PROPOSED ALUM STORAGE TANKS ARE TO BE 8,500 GALLON EACH, DOUBLE–WALLED TANKS FOR APPROXIMATELY 30 DAYS PRC SUPPLY.
2. ALUM TO BE FED AT THE GRIT TANK EFFLUENT CHANNEL PRIOR TO FLOW SPLITTING TO THE (4) EXISTING PRIMARY SETTLING TANKS.
3. PROPOSED ALUM FEED PUMPS TO BE LOCATED IN THE EXISTING PUMP AND CONTROL BUILDING.
4. PROPOSED NEW STRAIN PRESS AND HEAT EXCHANGES TO BE LOCATED IN DIGESTER BUILDING.

SCALE IN FEET

0 100' 200'

Civil & Environmental Consultants, Inc.
120 Genesis Boulevard · Bridgeport, WV 26330
Ph: 304.933.3119 · Fax: 304.933.3327
www.cecinc.com

CITY OF MOUNT VERNON, OHIO
PHOSPHORUS REMOVAL
PLANNING

EXISTING WATSE WATER TREATMENT PLANT SITE AND PROPOSED IMPROVEMENTS

DRAWN BY:	KES	CHECKED BY:	DRAFT	APPROVED BY:	DRAFT	EXHIBIT:
DATE:	JUNE, 2021	DWG SCALE:	1" = 100'	PROJECT NO:	310-731	2