



May 27, 2016

Tracey Braun, Director of Approvals
Environmental Approvals
Manitoba Conservation
123 Main Street, Suite 160
Winnipeg, MB R3C 1A5

Dear Ms. Braun,

RE: Amendment to 69 HW RR Hazardous Waste License for GFL Environmental Inc., Winnipeg Location

The following is a description of a wastewater treatment process in use at 1090 Kenaston Boulevard, Winnipeg, MB. During an inspection by Sonja Bridges of Manitoba Conservation on May 10, 2016 it was determined that the Environmental Approvals Branch had not been notified of the wastewater treatment process addition as per Clause 17 of License No. 69 HW RR. The following outlines the wastewater treatment process.

We have been in the process of drafting an amendment (started in early May) to describe operations more accurately than currently reflected in License No. 69 HW RR as well as applying for the addition of some new waste treatment processes we want to use in the future. When this request for an amendment is submitted we hope to obtain a new version of our License.

Description of Wastewater Treatment Process

Wastewater Treatment

Wastewater processed in the Cetco Model CE-400 automatic water treatment machine includes all wastewater except for sanitary sewage and domestic wastewater. Precipitation falling onsite and outside containment areas is also not typically collected for treatment. The machine has an estimated maximum throughput of approximately 9000 L/h and is located in the Wastewater Treatment Building. A copy of the site layout and the layout inside the Wastewater Treatment Building are provided in Appendix A.

The highest volumes of wastewater are treated April to October, during warmer weather. The Wastewater Treatment Building houses 11 tanks for clean and dirty water and the Cetco wastewater treatment unit. The treatment unit uses a bentonite clay-based flocculant to concentrate oil and particles so they can be more thoroughly and easily filtered out. Eight (8) tanks are used to hold “dirty”

water, two (2) tanks are for water polishing and one (1) tank holds “clean” water ready for disposal. The clean water is sent to the City of Winnipeg sewer system and the filtered solids (sludge) are put in a sludge bin onsite for offsite disposal.

A step-by-step illustrated process description is provided in Appendix B. There are 7 process steps:

1. Wastewater is pumped into the 1514 L treatment tank.
2. The treatment tank’s 3 HP engine agitator runs as the flocculant is added from a bulk hopper.
3. The flocculant coalesces oil and particles which fall out as sludge to the bottom of the treatment tank. This occurs during a short settling time.
4. Clear water is drawn from the top of the treatment tank and through a band filter to remove particles. The “cleaned” water goes to a filtrate tank.
5. Sludge at the bottom of the treatment tank is discharged to the band filter, trapping solids. Free water goes to the filtrate tank.
6. As solids build up on the band filter, it advances. The solids run through double rollers to squeeze out additional free liquid. Squeezed out sludge solids go into a dumpster.
7. Water in filtrate tank is pumped over to a polishing tank to allow for further settling out of any very fine particles. When the sludge bin is full its contents are dumped into a larger “sludge bin” for later disposal offsite.

Polished water is sent to the “Clean water” tank for temporary storage prior to batch discharge to the City of Winnipeg sewer. Effluent from the tank goes through an oil/water separator before entering the sewer system.

Copies of the layout and elevation drawings for the Cetco unit are in Appendix C. A complete copy of the Cetco CE-400 System Operation Manual is in Appendix D.

Wastewater Sampling and Analysis

The site holds Pollution Prevention Plan IWSB-PP-753 with the City of Winnipeg which requires meeting the water quality set out in Schedule B of the City of Winnipeg Sewer By-Law No. 92/2010.

The City of Winnipeg periodically takes a grab sample of water after the oil/water separator where it then enters the sewer. These samples are tested against the water quality parameters in Schedule B of the City of Winnipeg Sewer By-Law No. 92/2010. If any parameter is exceeded, the City of Winnipeg may impose a surcharge (certain parameters only) or issue an “Order to Correct By-law Violation” requiring Pollution Prevention Planning documents. The last test was done February 26, 2016 whereby the City of Winnipeg confirmed the effluent to sewer meets by-law requirements. A copy of their letter and the results of their testing are in Appendix E.

If you have any questions or require further information, please contact me via email or telephone (below).

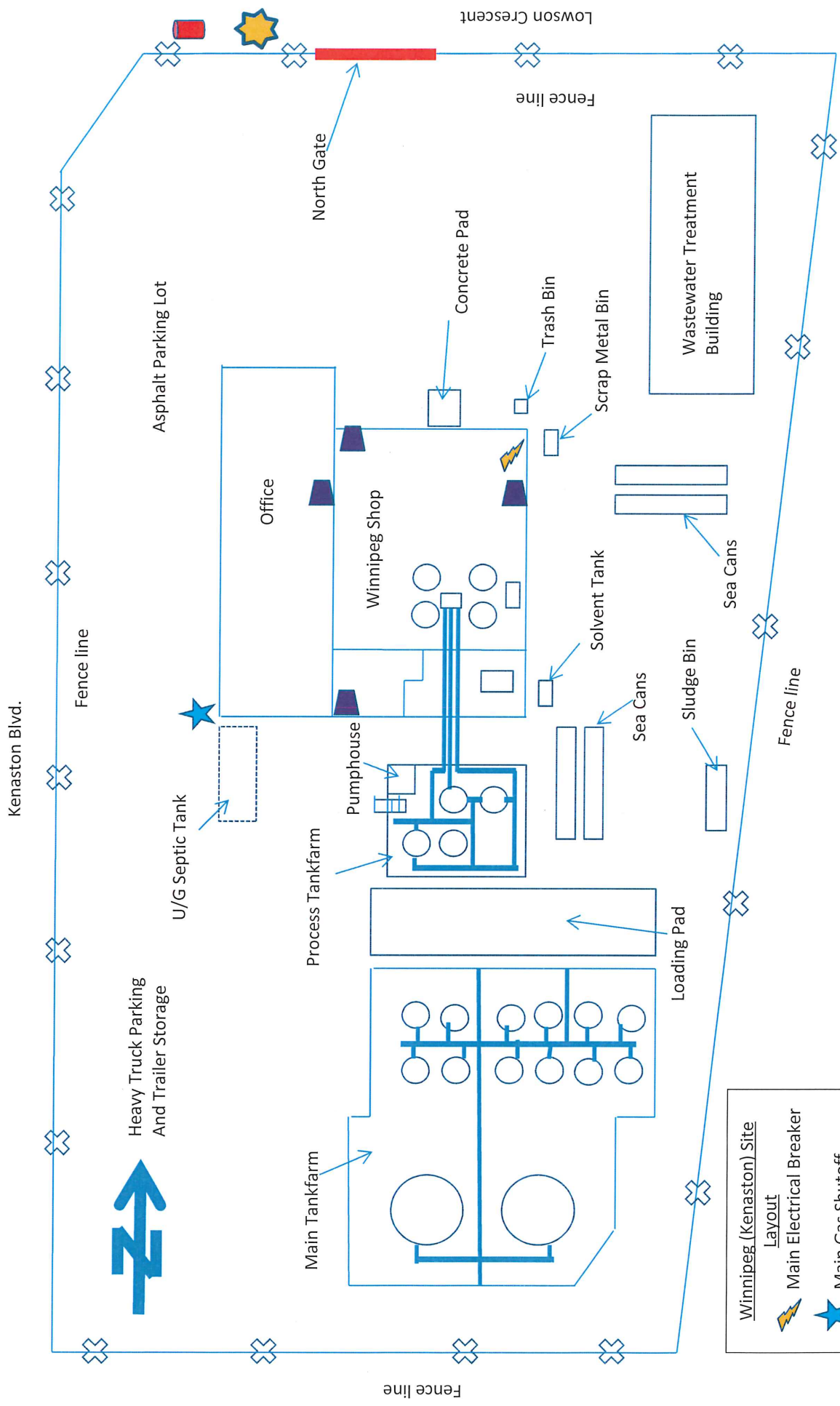
Sincerely,

A handwritten signature in black ink, appearing to read 'N. Ruhl', written in a cursive style.


Nola Ruhl, P. Eng.
Compliance Manager
GFL Environmental Inc.
4208 – 84 Avenue
Edmonton, AB, T6B 3N5
Wk: 780-485-5000
Email: nruhl@gflenv.com

cc: Raj Rathamano, Manitoba Conservation
Norm Klippenstein, Manitoba Operations Manager
Jason Henkel, Winnipeg Operations Manager
John Powell, General Manager

Appendix A: Site Layout and Wastewater Building Layout

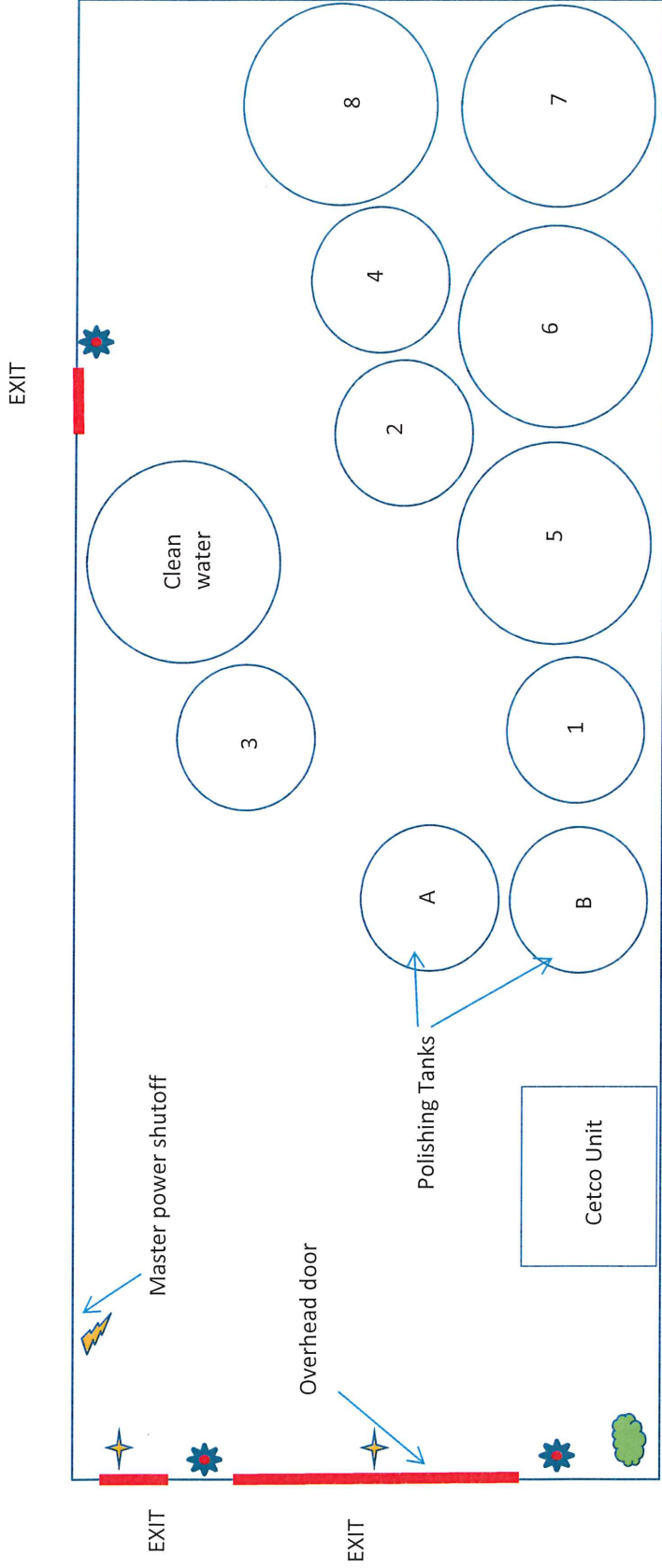


Winnipeg (Kenaston) Site Layout

-  Main Electrical Breaker
-  Main Gas Shutoff
-  Muster Points
-  Fire Hydrant & Valve
-  Audible alarms

Overview of Winnipeg (Kenaston) Site Layout
 (See details in Main Tank Farm, Process Tank Farm, Winnipeg Shop and Office Layouts – not all details are shown here)

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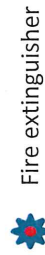


Winnipeg (Kenaston) Wastewater

Treatment Building



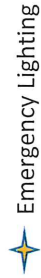
Electrical panel



Fire extinguisher



Spill Cleanup Materials



Emergency Lighting

NOTE: Tanks 1 through 8 are dirty water tanks

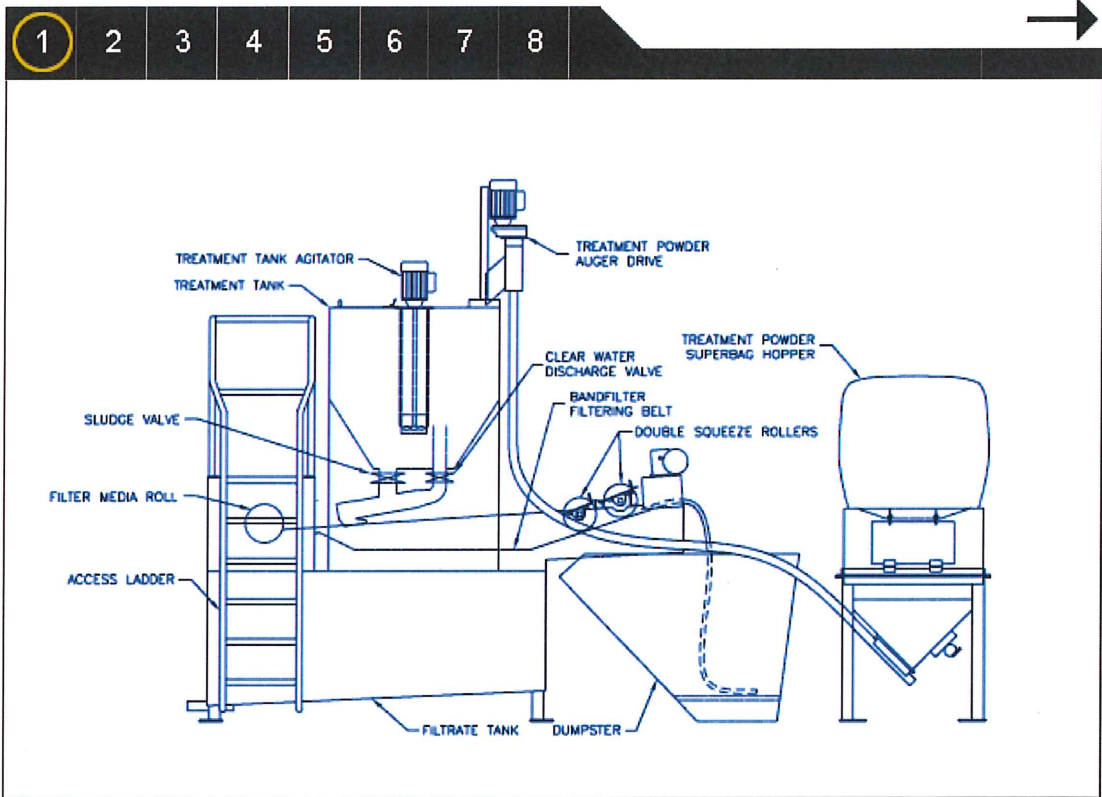


Appendix B: Illustrated Process Flow

THE PROCESS



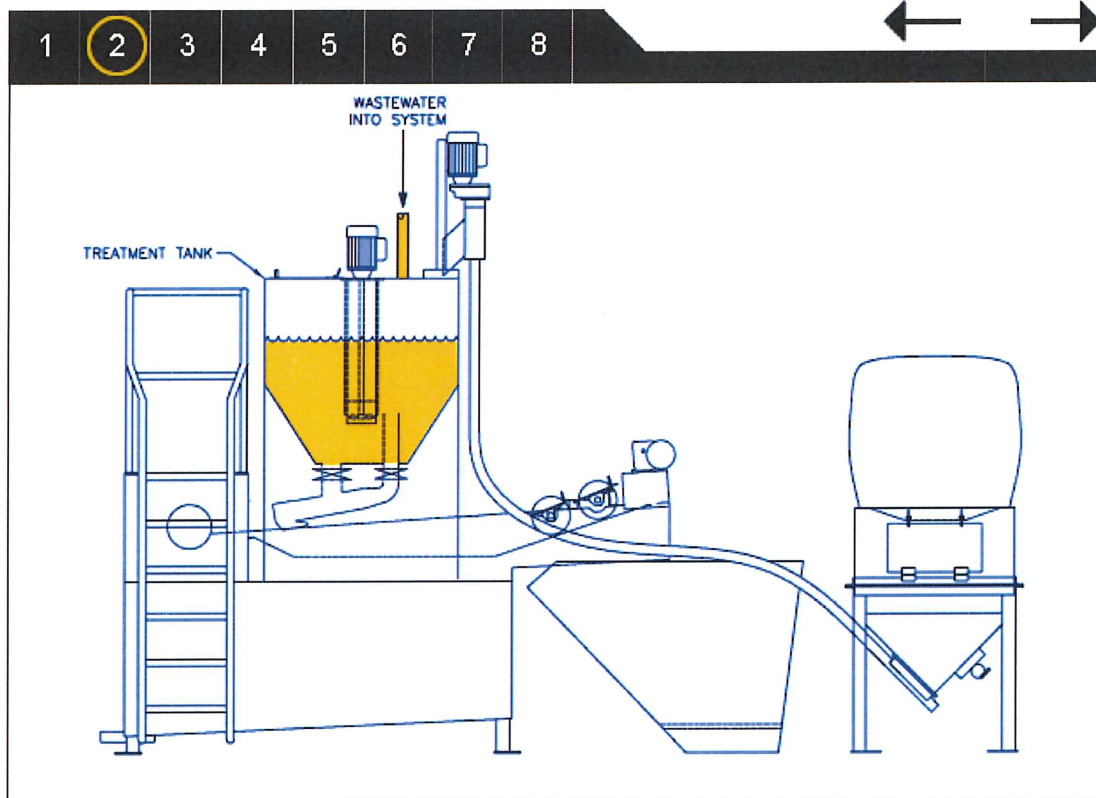
All of Ringwood Environmental's bandfilter systems provide treatment solutions with simple, minimal operation. The following diagrams outline the operation of a CE system, although all our bandfilter systems work on the same basic principles. Click through the steps to see how the process works.



THE PROCESS



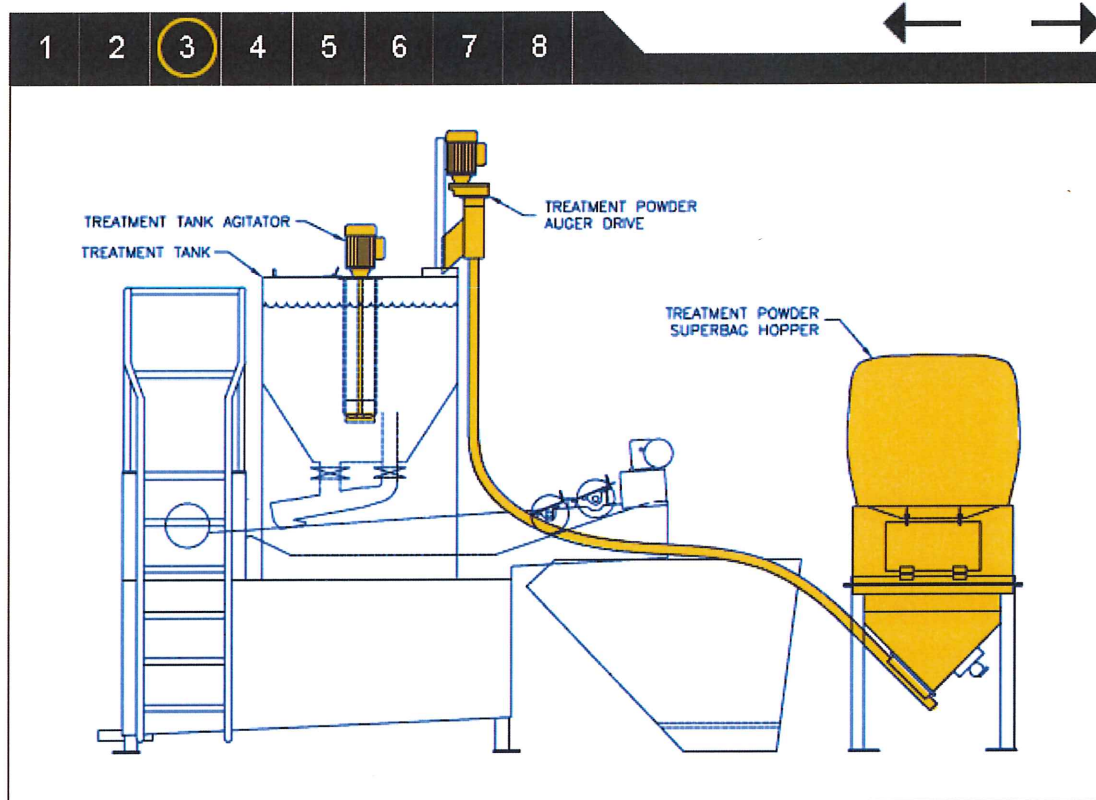
Wastewater is pumped to the system until the treatment tank is filled.



THE PROCESS



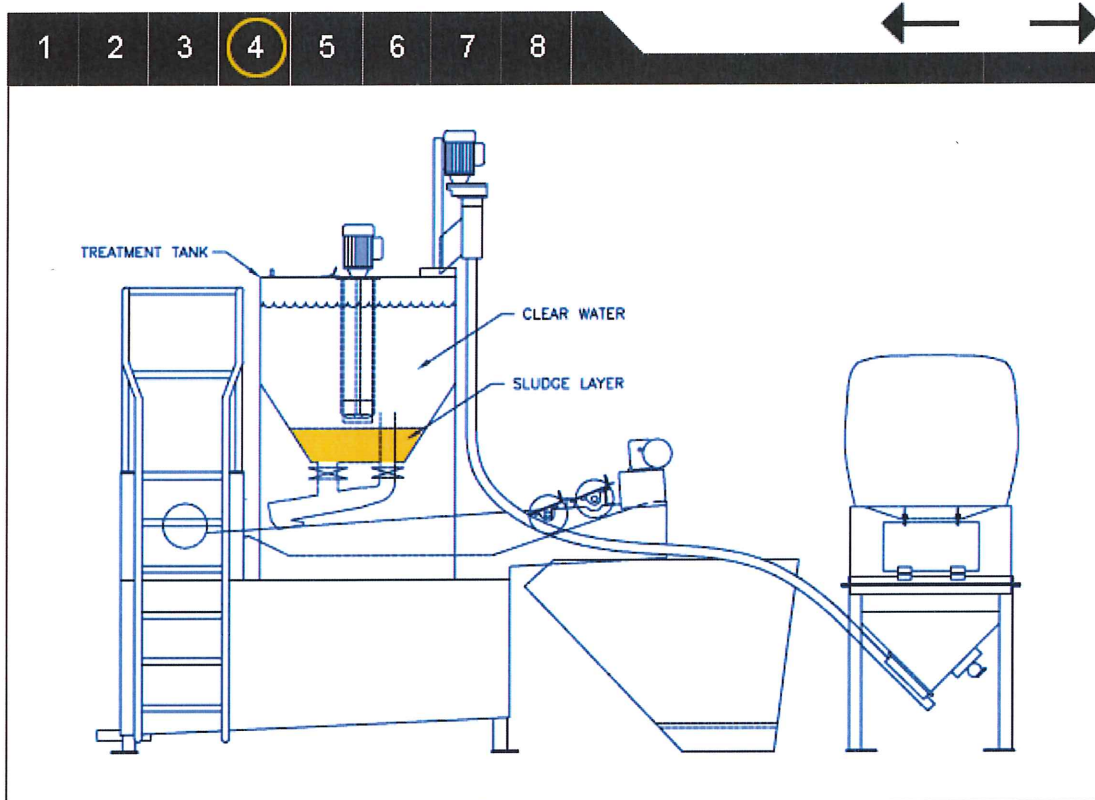
The treatment tank agitator runs as the treatment powder is added. After a short mix time, the agitator stops.



THE PROCESS



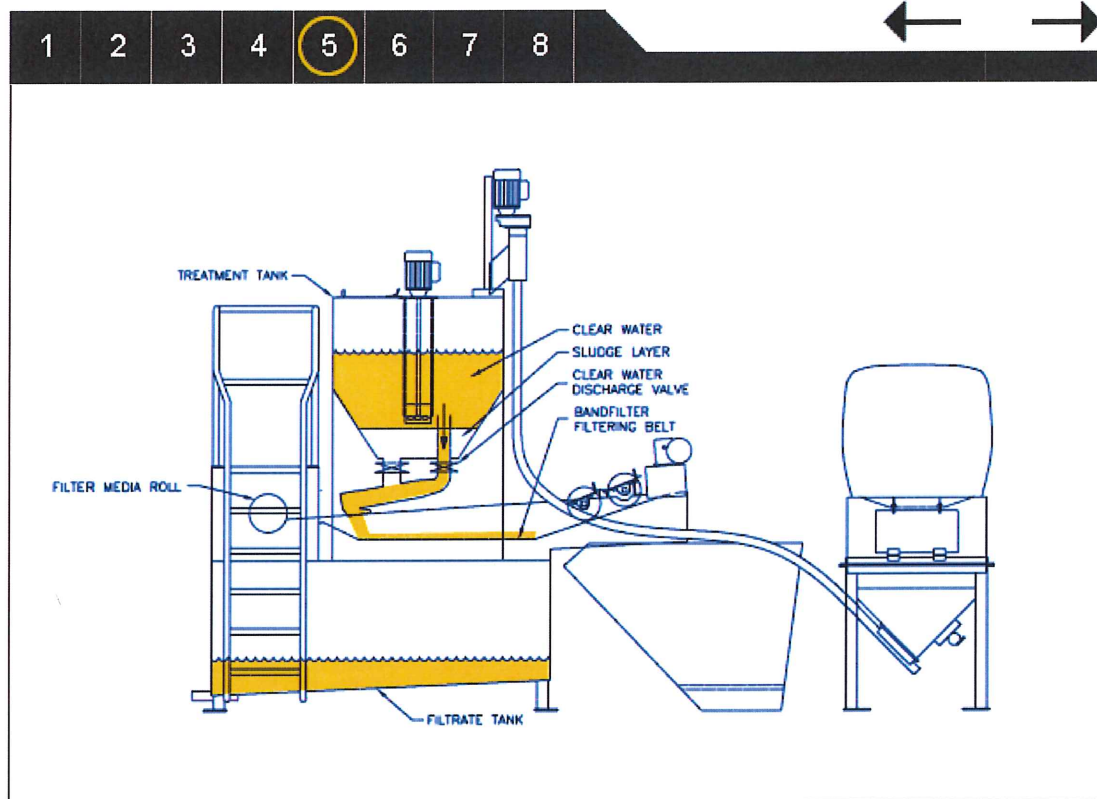
Large flocs are produced in the treatment tank during treatment, and the resulting sludge quickly settles to the bottom.



THE PROCESS



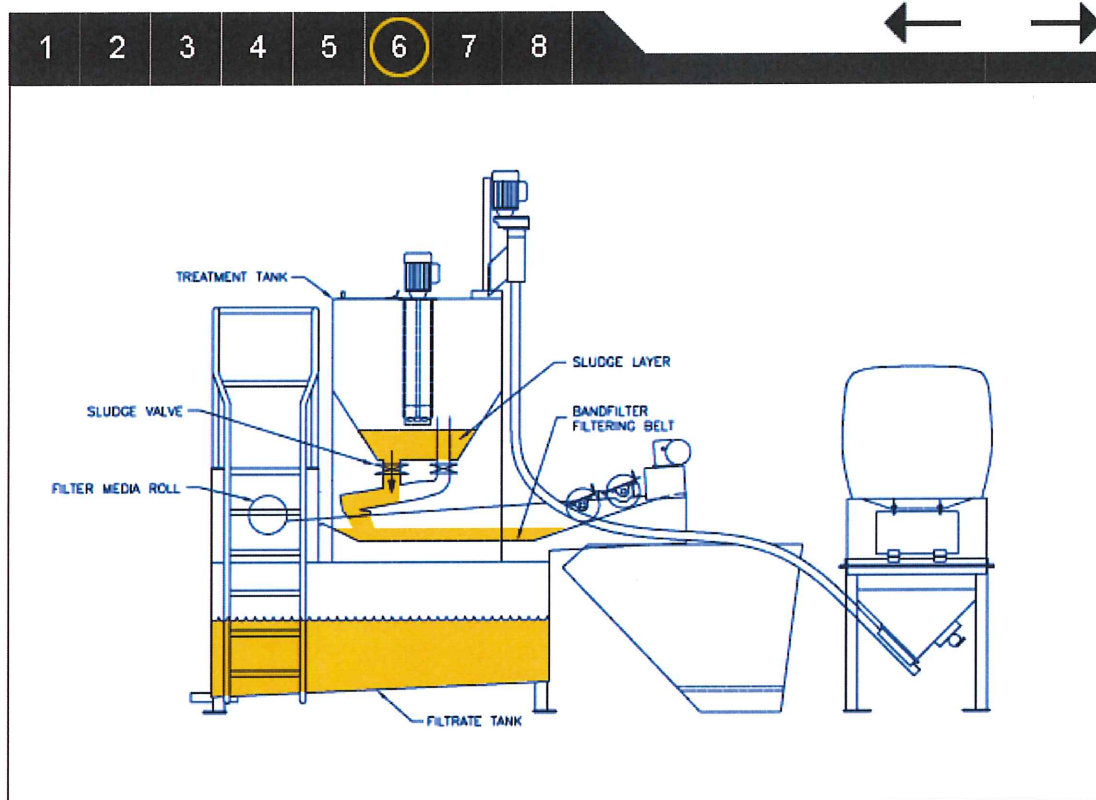
After the short settling time, the clear water is drawn from the top of the tank first, greatly speeding up the process time. This water flows onto the bandfilter. The disposable filter media traps unsettled floc particles as the water flows through and into the filtrate tank.



THE PROCESS



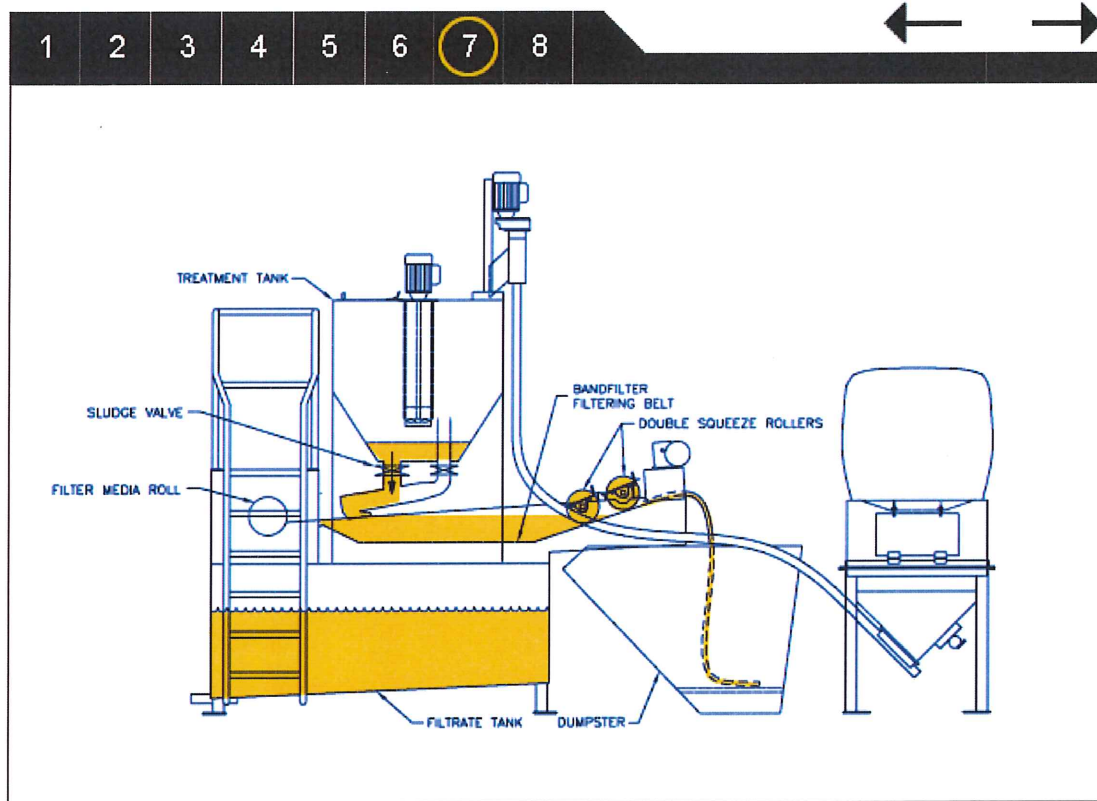
The sludge is now discharged onto the bandfilter. The filter media traps the sludge and allows the clean, treated water to pass through and into the filtrate tank.



THE PROCESS



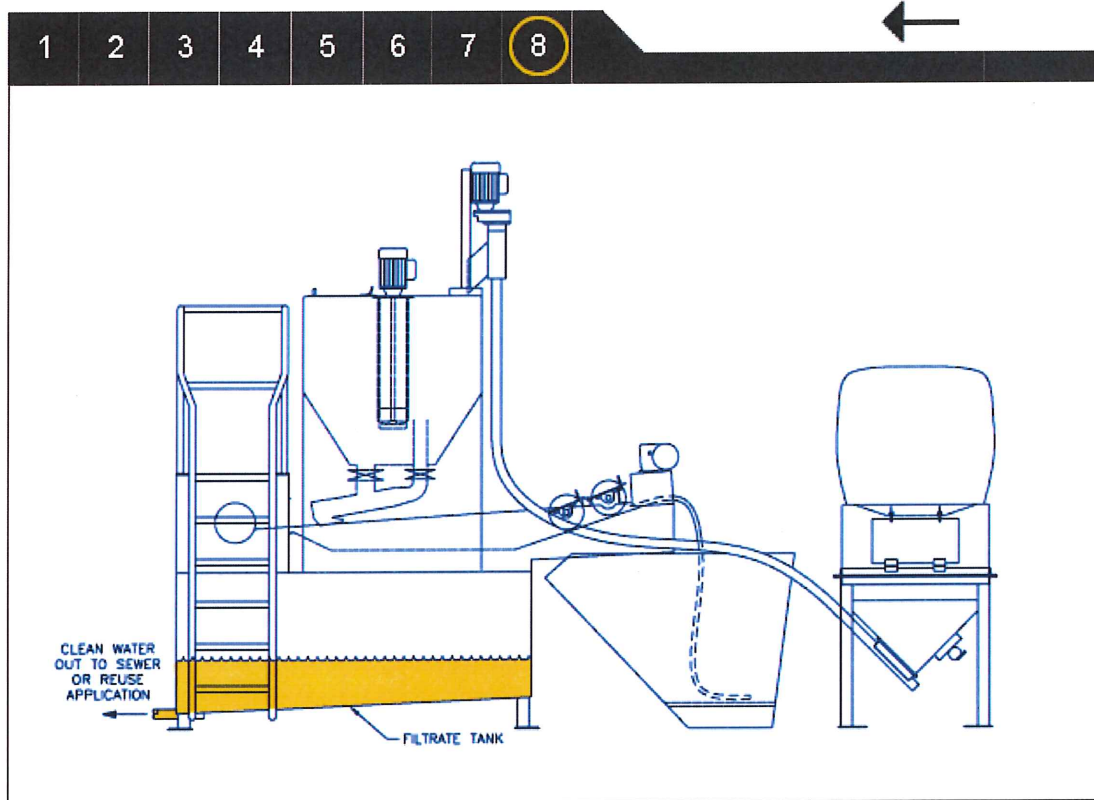
As the sludge builds up on the bandfilter, it advances and transfers the sludge to the dumpster. The sludge passes through the double rollers, which squeeze out more water.



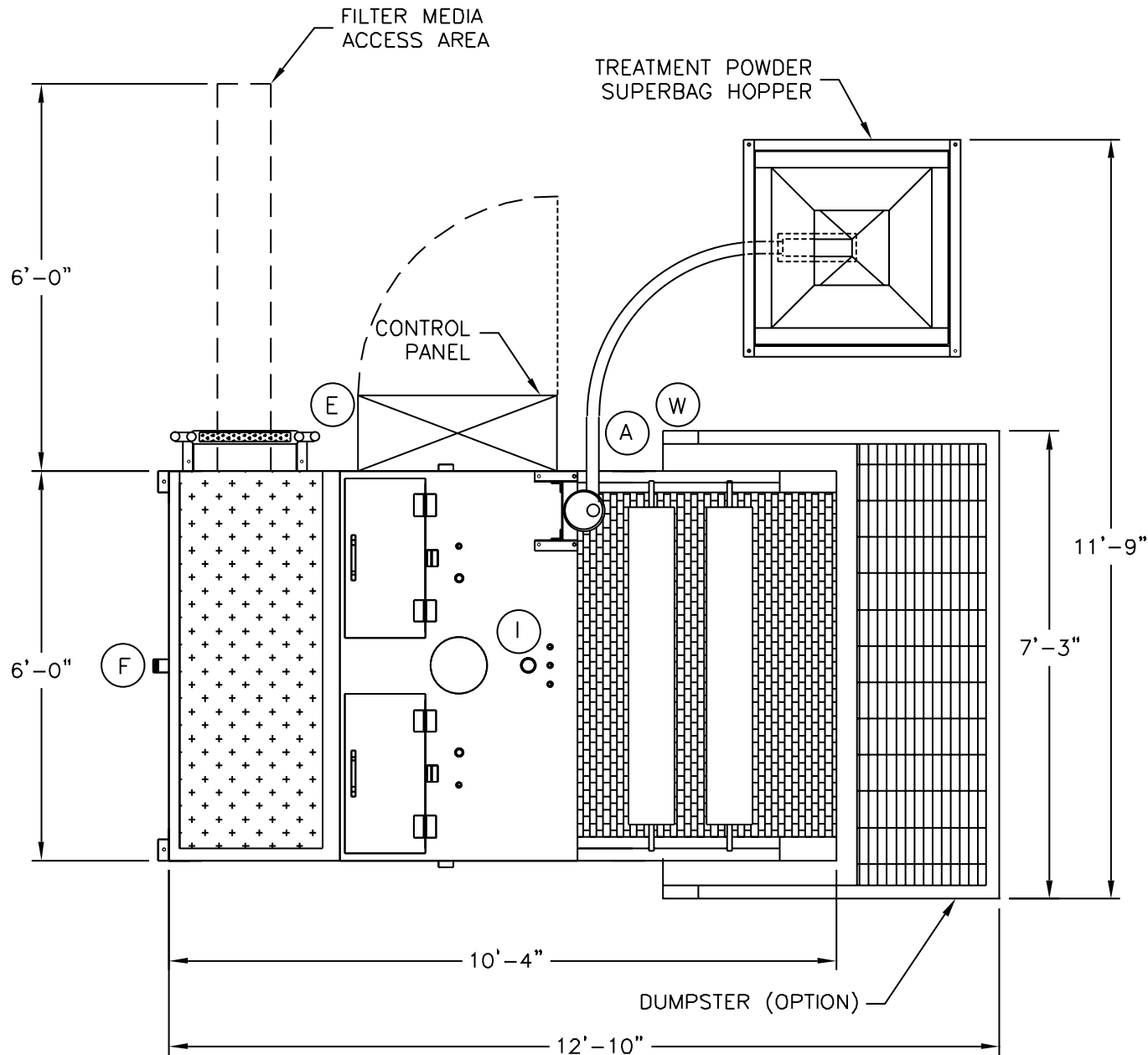
THE PROCESS



When all sludge has been dewatered, the treated water in the filtrate tank is pumped out.



Appendix C: Layout and Elevation Drawings



SERVICE REQUIREMENTS

- Ⓔ 480 VAC, 30 AMP, GROUNDED, 3 PHASE POWER TERMINATED AT THE DISCONNECT IN THE CONTROL PANEL.
- Ⓐ 1" FNPT AIR SUPPLY CONNECTION. 80-100 PSI, CLEAN, DRY, AIR REQUIRED, WITH LOCKING HANDLE VALVE ON SERVICE LINE.
- Ⓦ 1" FNPT CITY WATER SUPPLY CONNECTION. 30 PSI REQUIRED, WITH LOCKING HANDLE VALVE ON SERVICE LINE.
- Ⓘ 2" FNPT INFLUENT WATER INLET CONNECTION.
- Ⓕ 2" MNPT EFFLUENT WATER DISCHARGE CONNECTION.

CE 400
LAYOUT DRAWING

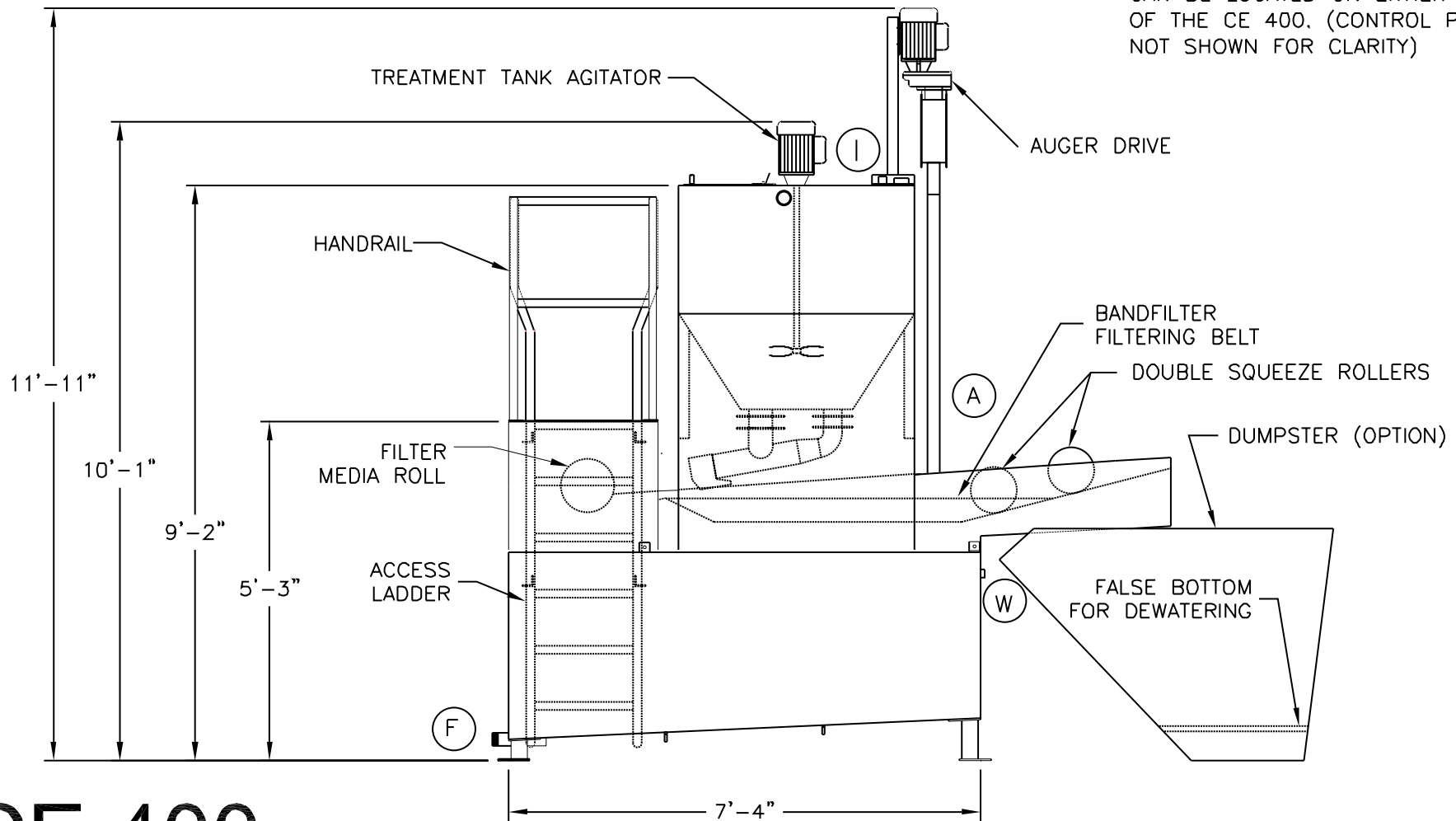
NOTE:
CONTROL PANEL, HOPPER, & LADDER
CAN BE LOCATED ON EITHER SIDE
OF THE CE 400.

SERVICE REQUIREMENTS

- (A) 1" FNPT AIR SUPPLY CONNECTION. 80-100 PSI, CLEAN, DRY, AIR REQUIRED, WITH LOCKING HANDLE VALVE ON SERVICE LINE.
- (E) 480 VAC, 30 AMP, GROUNDED, 3 PHASE POWER TERMINATED AT THE DISCONNECT IN THE CONTROL PANEL.

- (W) 1" FNPT CITY WATER SUPPLY CONNECTION. 30 PSI REQUIRED, WITH LOCKING HANDLE VALVE ON SERVICE LINE.
- (I) 2" FNPT INFLUENT WATER INLET CONNECTION.
- (F) 2" MNPT EFFLUENT WATER DISCHARGE CONNECTION.

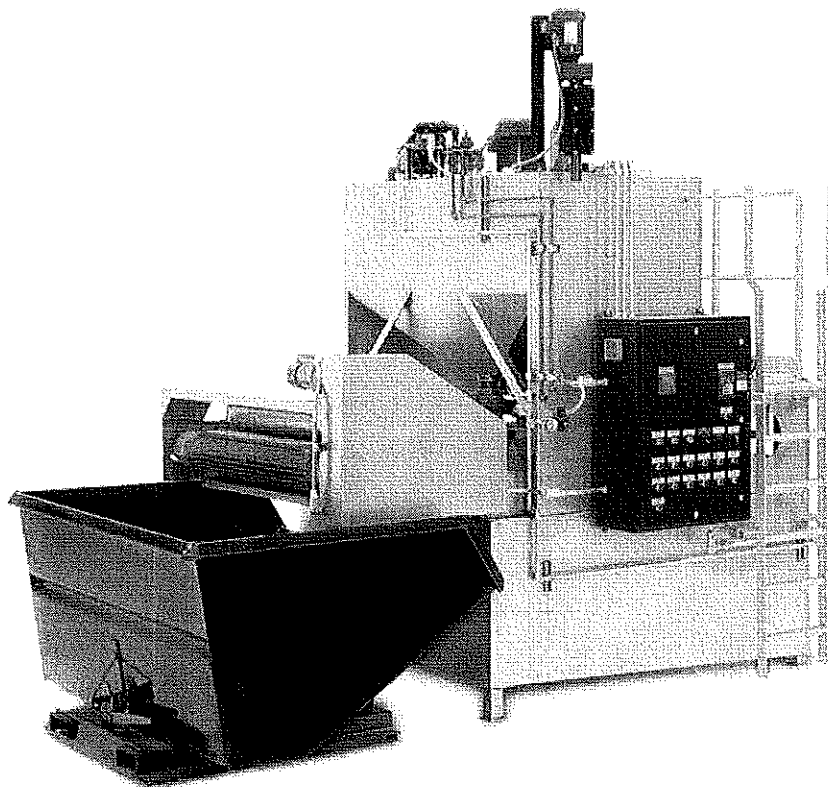
NOTE:
CONTROL PANEL, HOPPER, & LADDER CAN BE LOCATED ON EITHER SIDE OF THE CE 400. (CONTROL PANEL NOT SHOWN FOR CLARITY)



CE 400
ELEVATION DRAWING

Appendix D: Cetco CE-400 System Operation Manual

CE MODEL WASTEWATER TREATMENT AND FILTRATION SYSTEM OPERATION MANUAL



 **Ringwood**
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CE System

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Maintenance Schedule and Procedures
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WASTEWATER TREATMENT BASICS

CHEMICAL TERMS

A. pH

pH is a measurement of the acidic or basic intensity of a liquid or other substance. A pH may range from 0 - 14, where 0 is acidic and 14 is basic. A measurement of 7 is generally regarded as neutral. Sometimes it is necessary to adjust the pH of the wastewater during treatment.

B. Acid

Acid is used to lower the pH of the wastewater, either before or after treatment. It is a corrosive substance and is composed of hydrogen plus one or more other elements. In the presence of certain solvents or water, it reacts with the production of hydrogen ions. An acid reacts with an alkali to form a salt and water.

C. Base (Alkali)

Base is used to raise the pH of the wastewater, either before or after treatment. It is a corrosive substance, which has the ability to neutralize an acid and form a salt. Caustic soda (sodium hydroxide) is the most common.

D. Colloids

Very small, finely divided solids (particles that do not dissolve) that remain dispersed in a liquid due to their small size and electrical charge.

E. Flocculation

The process of gathering fine particles together to form larger particles (flocs). Flocculation is based on bridging compounds that form chemically bonded links between colloidal particles to form floc networks.

F. Polymers

Greek for "many parts", polymers are giant molecules with wide ranging molecular weights. Polymers are both inorganic and organic in nature. The synthetic polymers which we utilize in wastewater treatment are generally plastics. These long chain polymers are used to aid in the bonding of floc networks.

G. Treatment Powder

This combination of specially treated silica (sodium bentonite clay), polymers, and additives, it is used to separate contaminants in wastewater and encapsulate the contaminants within the clay platelets.

H. BOD

Biological Oxygen Demand - The rate at which biological organisms (bacteria) utilize the oxygen during an organic decomposing process. In decomposition, organic matter serves as food for the bacteria.

I. COD

Chemical Oxygen Demand - The amount of oxygen consumed from a chemical oxidant during a specific test. Measured in mg/L or PPM.

J. Chelation

Term applied to a reacting agent that envelops a species such as a metal ion. Chelating agents make the breakdown and separation process in wastewater treatment very difficult. Ammonia and EDTA are two of the most common and stable agents.

TREATMENT CONCEPTS

The following narrative gives some important concepts that are associated with wastewater treatment. The terms listed below are used in both the narrative and everyday wastewater treatment and should be duly noted.

- The Waste Stream
- EQ / Hold / Spikes
- pH Adjustment
- Coagulants / Flocculants
- Lime / Polymer
- Polishing

In your application, the beginning factor that we look for is consistency. All **waste streams** are often piped to an equalization tank. The capacity of this tank allows for a good measure of equalization, which will give us the best chance for a day in and day out consistency. This capacity and equalization allows us to more effectively handle **spikes** in the waste stream, which could upset our pre-set treatment values.

We will possibly **adjust the pH** of the waste stream in the treatment tank to a lower value than that which is delivered. pH control can be a great tool when problem

batches arrive at the treatment system. Treating within a known pH range will allow for consistent results.

Many treatment schemes utilize **coagulants** as a preliminary treatment step. These low pH chemicals tend to break down the various compounds, which will allow for better separation. Addition of **flocculants** aid in the separation process. These flocculants are generally in the form of polymers, which help to tie up the contaminants, which have been partially separated by the preliminary coagulant process. Conventional wastewater treatment utilizes a "**lime-polymer**" process whereby the waste stream is shocked via a low pH (2-3), then treated with a polymer to aid in the separation, and lastly, hit with a lime slurry, which raises the pH and binds the overall process. This process is popular due to its economical components. The three-step process is sometimes performed in varying sequences.

Wastewater treatment is not an exact science.

We must remember that our waste stream is changing daily with regard to solids loading and concentrations of chemicals that find their way into the stream through unknown means. There are generally several points of entry within a facility where co-workers who don't consider the consequences to the treatment system operator can introduce problems. Ammonia, soaps, solvents, oils, and other chemicals found within a normal facility will greatly affect the treatability of any waste stream.

TREATMENT CHEMICALS

The most common treatment powder is a sodium bentonite clay based flocculant. It was originally designed to offer a one-step type of treatment targeted at removing heavy metals and oils.

Some of the industrial waste streams that utilize this modern form of wastewater treatment include:

- Aerospace Industry
- Ink & Paint Manufacturers
- Tanneries
- Truck & Tanker Wash
- Pulp & Paper Industry
- Food Processing Industry
- Plating Industry
- Automotive Manufacturers
- Agricultural Formulators
- Oil & Gas Industry

The success of the clay technology is due in part to the wide range of encapsulating properties that are associated with the product. It also has the ability to be formulated for specific applications.

HOW THE TREATMENT POWDER WORKS

The treatment powder is formulated to work through a sequence of reactions when wetted. The sequence is controlled by the solubility rates of the components.

1. The dry acid solublizes and reduces the pH in the wastewater to a point where the emulsion breaks.
2. As the oils break out of the emulsion, they are attracted to the cationic polymer. The cationic polymer, once fully wetted, is attracting all anionic charged molecules onto itself.
3. The calcium hydroxide solublizes next causing the pH to increase and precipitate metals, which are immediately attached onto the negatively charged bentonite clay.
4. The clay, being a negative charge, is ultimately attracted to the cationic polymer laden with oils and suspended solids. This attraction forms a fixated cocoon around the cationic polymer. This final reaction explains how we end up with a non-leachable sludge cake.
5. The clay complex forms flocs and settles out of the water with all contaminates permanently locked up in the clay complex.
6. The advantage of this chemistry is that the equipment can run faster, automatically, and provide a non-leachable (and non-hazardous) sludge.

RECORD KEEPING

Keep a log sheet:

- To dispute municipalities claims of discharge permit violations.
- To assist in troubleshooting environmental dilemmas in the facility.
- For assistance in issuance of permits required by regulators.

Log Sheets

- Log sheets should be kept by operators to help give a more defined picture of the treatment process.
- A well-kept log sheet will provide the best tool in troubleshooting the process.
- Log sheets will plot trends and histories.
- Financial aspects of the treatment process can be tracked.

Log sheets should include some of the following but not be limited to:

- Batch Number: Each batch should be assigned a number, for future tracking.
- Date / Time: The date / time the batch treatment was started.
- Initials: The initials of the person performing the treatment procedures.
- Starting pH: The starting pH of each batch should be recorded.
- Amount of chemicals used: For treatment history.

- Comments: Can include characteristics of the batch before and after treatment, treatment problems, etc.

Analytical records

Analytical records should be matched to log sheets to more definitively plot histories and trends of your treatment process.

System maintenance records

All system components should be placed under the same preventative maintenance program as other plant equipment.

pH Probe calibration

Records should be kept each time the pH system is calibrated. A number of organizations will require this for ISO and other certification programs.

PROCESS AND EQUIPMENT OVERVIEW

To fully understand the overall operation of the system and the role of the individual parts, this section describes the treatment process and the function of the equipment as it relates to the treatment process.

Treatment of wastewater is inherently a batch process. The CE system treats water automatically and continuously. Since the system operates on small volumes, one after another, in effect, it can be considered continuous.

There are four major parts to any wastewater treatment process. The influent water (or raw wastewater) must be stored while waiting for treatment. Then the water is treated. Following treatment, the sludge must be separated from the treated water. And finally, the treated water must be discharged or stored for reuse. These four parts of the process and how the equipment performs them are described below.

Equalization Tank (Option)

This is where the influent water is stored. The purpose of the equalization tank is to receive the various waste streams from throughout the plant and maintain the water such that the solid content and pH of the water is homogenous and consistent. Typically, it is desirable to store at least three times the treatment batch size to ensure consistency. Related components of the equalization tank are:

Agitator – Provides the mixing action in the equalization tank. The agitator runs occasionally on a timed cycle. It also runs for a few minutes prior to starting a treatment batch.

Overfill Level Probe – Provides an alarm that the equalization tank has reached its capacity. This can also be used to turn off the feed pumps that transfer wastewater to the equalization tank.

Batch Start Level Probe – Provides a signal to the control system indicating there is enough wastewater in the equalization tank to start a treatment batch. This level should be at least three times the holding capacity of the treatment tank for a consistent treatment process. This probe also prevents the equalization tank agitator from running when the water level is low, eliminating the potential for damage to the agitator.

Influent Transfer Pump – This pump transfers the influent water from the equalization tank to the treatment tank.

Treatment Tank

This is the upper tank on the CE system unit. It is the heart of the system where the actual treatment takes place. The influent transfer pump delivers wastewater from the equalization tank to this tank. Once the tank is full, several different operations can be performed to treat the water. The associated components and equipment and their functions are as follows:

Agitator – The agitator mixes in the chemicals, facilitating treatment.

Treatment Powder Hopper and Auger – Powdered clay-based flocculant is the primary chemical used in the treatment process. It is delivered to the treatment tank via a flexible auger from a super bag hopper and is mixed in and allowed to react with the wastewater, encapsulating the solids. Running time and dosages are pre-set according to the formula, and controlled automatically during each treatment cycle. A low-level probe on the hopper alerts the operator when the hopper is low. The hopper holds a 2000-pound bulk bag that is set on top using a forklift. After the bulk bag is set on top, the side door on the hopper is opened, and the operator reaches in to untie the duffel bag outlet on the bottom of the bag.

Fill and Overfill Probes – The fill probe provides a signal to the control system that the treatment tank is full and treatment can begin. The overfill probe provides an alarm that the tank has been filled to capacity.

Bandfilter

Following treatment, large, visible pieces of floc are present, which can be easily removed, leaving clear, treated water. The process of removing the floc is called dewatering. After the water is treated in the treatment tank, the floc is allowed to settle to the bottom of the tank. The clear water on top can be drawn off first, to speed up the dewatering process. Then the sludge (floc) is dumped. All the water and sludge passes through the bandfilter where the sludge is filtered out and the clear water passes through. The following devices are involved in the process.

Clear Water Valve – This valve is located on the bottom of the treatment tank with a standpipe inside the treatment tank. The standpipe is long enough to extend above the sludge layer. After settling, the clear water valve opens to allow the effluent water to drain onto the bandfilter.

Sludge Discharge Valve – This valve is located on the bottom of the treatment tank and opens to allow the sludge to dump onto the bandfilter.

Bandfilter – The bandfilter captures the sludge as it is dumped from treatment tank and allows the water to drain from the sludge through the filter media. The sludge and used filter media is conveyed to a dumpster. An adjustable speed motor drives the bandfilter.

Float Switch – This device turns on the bandfilter when the sludge on the bandfilter reaches a certain thickness. This provides clean filter paper for more sludge to discharge from the treatment tank.

Filter Media Roll and Media Sensor – A roll of filter media is stored and unrolls as needed by the bandfilter. The media sensor is a photo-switch that sounds an alarm when the media roll is empty.

Squeeze Roll – As the sludge and filter media advances down the bandfilter, this roller squeezes the water out of the sludge before the filter media falls into the dumpster.

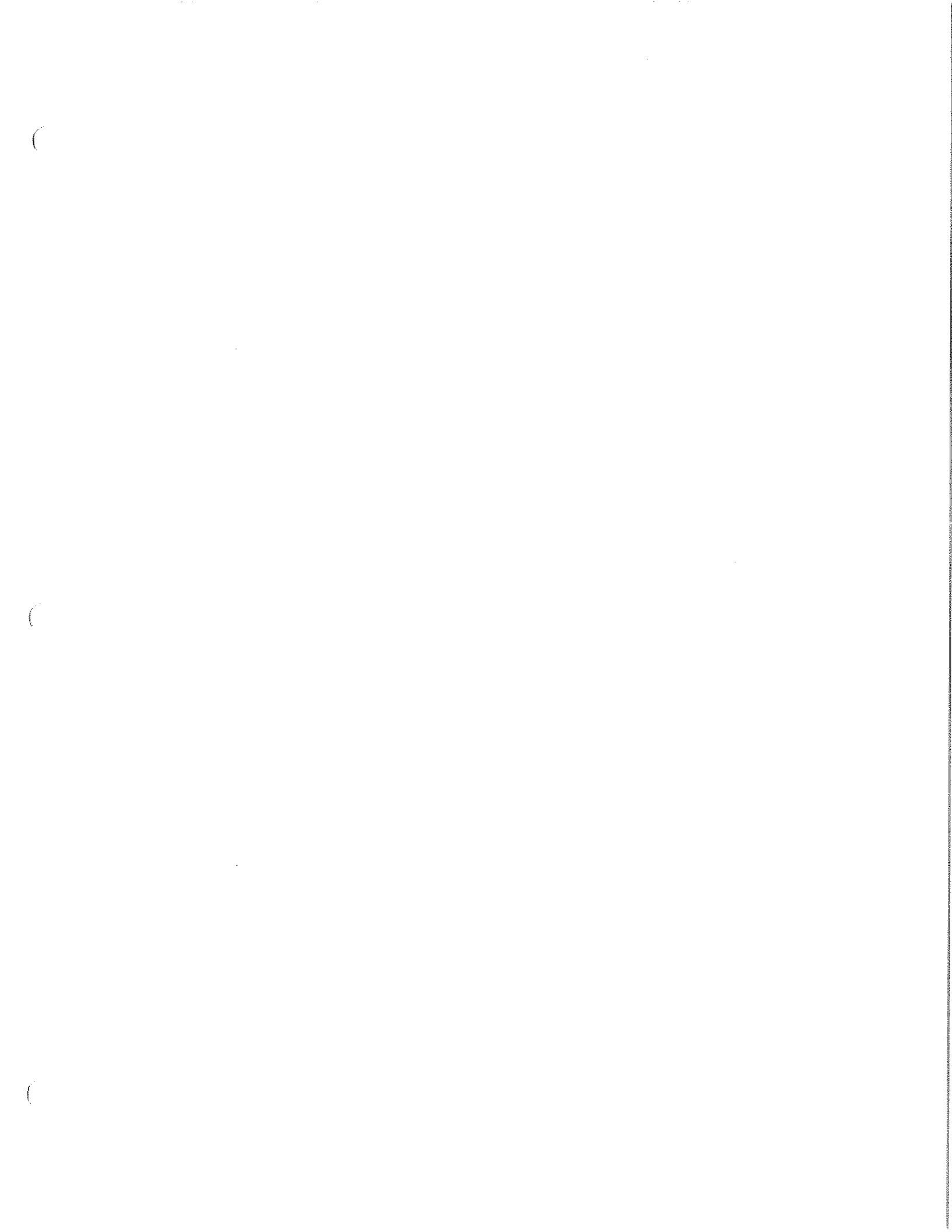
Effluent Tank

The effluent tank is the lower tank on the CE system and is used to contain the effluent water that passes through the bandfilter during dewatering. This water is ready for discharge to the municipal sewer system or it can be stored for reuse. Related components of the effluent tank are:

Effluent Transfer Pump – This pump transfers the effluent (treated) water from the effluent tank to the reuse tank or municipal sewer system.

Level Probe – This probe is activated by the water level in the effluent tank and controls the discharge from the tank.

This section of the manual described the overall treatment process and a general overview of the equipment involved. The next section describes the treatment process in more detail by providing the step-by-step operations necessary to treat a batch manually.



MANUAL OPERATION STEP DESCRIPTIONS

1. Make sure that the treatment tank is empty, there is RM-10 in the hopper and that there is enough water to treat a batch.
2. Turn on the equalization tank agitator (if available) for a few minutes to ensure that any particles in the water are dispersed evenly.
3. Turn on the influent transfer pump to transfer water to the treatment tank. Continue to run the equalization tank agitator during transfer as long as the water level in the equalization tank is above the propeller. If it drops below this point, turn off the agitator.

CAUTION: *Do not run the agitator if the water level in the tank is not above the propeller. Damage to the agitator can result.*

4. When the treatment tank is full, turn off the influent transfer pump. Also, turn off the equalization tank agitator if it is still on.

Once the treatment tank is full, it is time to begin treatment. The sequence of steps varies from system to system and is defined in the Equipment Setup list. Refer to the Equipment Setup listing for your system's sequence of operation. Regardless of the sequence, the following descriptions identify what the operator needs to do in each step when treating manually:

LOWERING THE pH (ACID ADDITION) – MANUAL (OPTIONAL)

1. Turn on the treatment tank agitator.
2. Turn on the pH recirculation pump. This circulates water from the treatment tank across the pH probe.
3. Watch the pH display on the treatment tank pH meter. When the pH display stops changing, it is time to adjust the pH. If the pH is above the desired pH, turn on the acid pump to add acid to the treatment tank.
4. When the pH matches the desired value (within +/- 0.2) turn off the acid pump. Also turn off the pH recirculation pump.

RAISING THE pH (BASE ADDITION) – MANUAL (OPTIONAL)

1. Turn on the treatment tank agitator.
2. Turn on the pH recirculation pump. This circulates water from the treatment tank across the pH probe.
3. Watch the pH display on the treatment tank pH meter. When the pH display stops changing, it is time to adjust the pH. If the pH is below the desired pH, turn on the base pump to add base to the treatment tank.
4. When the pH matches the desired value, within (+/- 0.2) turn off the base pump. Also turn off the pH recirculation pump.

TREATMENT POWDER ADDITION - MANUAL

1. If not already running, turn on the treatment tank agitator.
2. Turn on the auger to add Treatment Powder to the treatment tank. Using the "Treatment Powder Addition Time" value, time the addition.
3. After the correct amount of Treatment Powder has been added, turn off the auger.

TREATMENT TANK MIX TIME - MANUAL

1. If not already running, turn on the treatment tank agitator.
2. Let the agitator run for the amount of time required for the appropriate "Mix Time."
3. When the "Mix Time" is over, turn off the treatment tank agitator.

SLUDGE SETTLE / REACTION TIME - MANUAL

1. If running, turn off the treatment tank agitator.
2. Leave the agitator off for the amount of time required for the appropriate "Sludge Settle / Reaction Time." When the "Sludge Settle / Reaction Time" is over, go on to the next step.

CLEAR WATER DISCHARGE TIME - MANUAL

1. Open the clear water valve to allow the water to flow onto the Bandfilter.
2. Watch the level in the treatment tank. When all clear water has been discharged, close the valve.

SLUDGE DISCHARGE TIME - MANUAL

1. Open the sludge valve to allow sludge to flow onto the Bandfilter.
2. Watch the level in the treatment tank. When all sludge has been discharged, close the sludge valve.

BANDFILTER OPERATION - MANUAL

Whenever the system is in the Clear Water or Sludge Discharge steps, the bandfilter must be manually operated. Watch the sludge accumulation on the bandfilter and advance the bandfilter when the plastic float, which rides on top of the bandfilter belt, begins to lift. Follow these steps:

1. Close the clear water valve or sludge valve (whichever happens to be open).
2. Turn on the bandfilter. The bandfilter advance speed can be adjusted through the speed dial on the control panel.
3. When the float drops back down onto clean filter media, turn the bandfilter off.
4. Open the clear water valve or sludge valve (whichever one is currently being used).

When all the sludge has been discharged from the treatment tank, the batch is finished.

03/02

SYSTEM CONTROLS

This system is designed to function as a fully automatic system requiring minimal operator intervention. The control panel consists of an operator interface keypad, pH meter(s), pushbuttons, and selector switches. The following describes the purpose and use of each device.

SYSTEM CONTROL PUSHBUTTONS

The following pushbuttons are used to put the system in automatic, put it on hold, acknowledge alarms, etc.

EMERGENCY STOP

Press this button to remove power from all devices. The button is lit when pulled out and not in an Emergency Stop condition.

CONTROL POWER

This switch turns on and off control power to the control panel. When control power is on, the light is on.

AUTO / MANUAL

Press this button to toggle between automatic and manual modes. The button is lit while in automatic.

AUTO – This is the normal operating mode for the system and should be used except when equipment malfunction necessitates manual operation. While in automatic all alarms are active and the system runs automatically as described in the “Detailed Automatic Step Descriptions” section.

To switch from manual to automatic, press the AUTO / MANUAL button. The system will go into automatic and the AUTO / MANUAL button will be lit. The system immediately goes on hold when switching to automatic, and the HOLD / RESUME button will be lit to indicate this. Press the HOLD / RESUME button to take the system out of hold.

MANUAL – The manual mode is to be used when manual operation of the system is required due to a malfunction with the equipment. Also, when the system is first powered up, it will be in manual.

To switch from automatic to manual, first press the HOLD / RESUME button to put the system on hold. The system will not allow switching from automatic to manual without first putting the system on hold. Then press the AUTO / MANUAL button to put the system in manual.

Please Note: Switching from automatic to manual during a treatment batch will reset the automatic sequence for that batch. The batch will have to be finished manually.

See the "Manual Operation Step Descriptions" section to treat a batch manually. While in manual all operations must be performed with the selector switches, although certain functions will operate automatically as follows:

- The equalization tank overflow alarm will activate if the level in the tank reaches the overflow probe. (Optional)
- The influent transfer pump will stop automatically when the water level in the treatment tank hits the overflow probe.

HOLD / RESUME

Press this button to toggle in and out of the hold mode. The button is lit while on hold. The system will automatically go on hold under the following circumstances:

- The system immediately goes on hold when switching from manual to automatic mode.
- Anytime that there is an alarm the system will go on hold.

The operator for the following reasons can put the system on hold:

- To attend to the system, such as changing the filter paper roll, for example.
- To perform an operation manually. While on hold, manual operation of all devices is possible without getting an "ALL SWITCHES NOT IN AUTO" alarm (see the "Alarms" section).
- To prevent batches from being treated while allowing the equalization tank agitator on/off cycle (optional) to operate.
- As a first step to reset the treatment batch and go into manual mode.

While on hold, all automatic batch operations stop, although certain functions will operate automatically as follows:

- The equalization tank agitator on/off cycle (optional) will continue to operate.
- The equalization tank overflow alarm will activate if the level in the tank reaches the overflow probe.
- The influent transfer pump will stop automatically when the water level in the treatment tank hits the overflow probe.

To take the system out of hold, press the HOLD / RESUME button. The button light will go out to indicate that the system is not on hold.

ALARM ACKNOWLEDGE

Press this button to silence the alarm buzzer when an alarm is activated. The button is lit when an alarm is initially triggered. After pressing this button, the alarm buzzer is silenced and the light flashes to indicate that the system is still in an alarm state. When the alarm state is removed, the light will go out. See the "Alarms" section for complete details.

SELECTOR SWITCHES

All moving devices are controlled through three-position selector switches. The switches operate as follows:

Motors and Pumps – ON / OFF / AUTO

- ON - The motor or pump runs while the switch is in this position.
- OFF - The motor or pump will not run while the switch is in this position.
- AUTO - The motor or pump will start and stop automatically according to the process sequence while the switch is in this position.

Actuated Valves – OPEN / CLOSED / AUTO


- OPEN - The valve is open while the switch is in this position.
- CLOSED - The valve is closed while the switch is in this position.
- AUTO - The valve will open and close automatically according to the process sequence, while the switch is in this position.

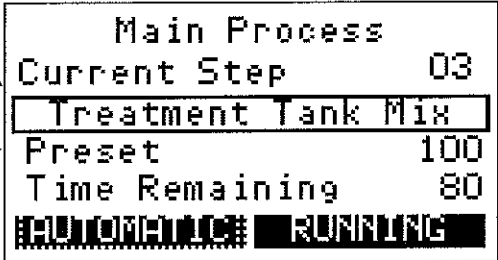
BANDFILTER SPEED - A speed dial controls the bandfilter belt speed. Whether in automatic or manual, the bandfilter speed is determined by the setting on this dial. The dial can be adjusted at any time.

OPERATOR SCREENS

BATCH STATUS SCREEN

When the process is running, this screen displays the current step that's running, the preset time for that step, and the time remaining in the step.

Access this screen by pressing the  button on the display keypad.



Displays the type of step in progress

Displays the total time allotted for the step.

Indicates if the system is in automatic.

AUTOMATIC – In auto
MANUAL – Not in auto


Displays the step number in progress.

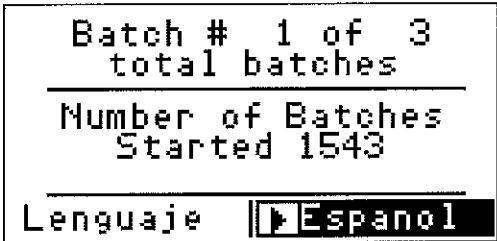
Displays the time left to the end of the step.

Indicates if the system is in a batch.

RUNNING – Batch in process
IDLE – System waiting for water level in EQ tank
HOLD – System on hold
ALARM – System has an alarm

SYSTEM STATUS SCREEN


Access this screen by pressing the button  on the display keypad.




Number of batches to run in a cycle. This is used to allow the operator to stop the system after a certain number of batches

Number of total batches run since the totalizer counter was last reset (see the changing equipment automatic operation section to reset the totalizer)

PASSWORD ACCESS SCREEN

Access this screen by pressing the button  on the display keypad. This display will ask for a password. Enter the password using the number keypad. If the password is not known, check with the operator or supervisor. Once the password is entered press the return key to accept it. The setup screen selection menu will appear and a more detail explanation of these menus and screens if provided in the *Changing Equipment Automatic Operation* section.

FORMULA SELECT SCREEN

Access this screen by pressing the button  on the display keypad. This display will then take the operator to the formula select screen that allows the operator to choose which equalization tank the waste is to be pumped from and which programmed treatment formula to use.

The Formula Select Screen:


```

Current- Formula 1
Next Formula 1
Formula  Formula 2


Current Stream A
Eq Tank  Stream A
          Stream B
  
```

Once the unit is in operation and a batch has been started, the operator can then change the desired equalization tank and formula for the next batch. The unit will finish the current batch in operation and start the next batch from the selected tank with the selected formula.

FORMULA EDITING OPERATION CYCLE KEY

This screen and button can only be used once the password access screen has been entered. Once the operator has access the setup screen selection menu, and enters the formula edit section, the  button is used to between toggle the operational functions in the formula.

ALARM STATUS SCREEN

This screen is accessed by pressing the  button on the display keypad. The button allows the operator to see the current alarm triggered. The operator can access any of the other screens while the unit is in an active alarm state and this button when pressed will take the operator back to the alarm screen.

Active Alarm Screen:

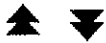
```

- A19 -
Treatment Tank
High Level Probe
Failure

```

AUTOMATIC **RUNNING**

DOUBLE ARROW KEYS



These buttons are used during the formula editing section. To move to the next or previous step, use the "Double Arrow Up/Down" buttons. Each press of a button will move the step up or down one.

SEQUENCE OF OPERATION

The CE system allows for a flexible formula sequence, enabling it to be tailored to the waste stream. The system goes through a number of steps to treat the wastewater and each step has one value (usually a time) associated with it. These steps are defined when the system is first started up and normally this sequence will not need to be changed. However, if the waste stream changes or new treatment chemicals become available, the flexibility is built into the system to allow for future sequence and/or step value changes. This section describes the structure of the sequence of operations. Refer to the "Changing Equipment Automation Operation" and "Formula Editing" sections for instructions on how to enter the values into the system controller, and see the "Automatic Treatment Step Descriptions" for a detailed description of each step.

There are certain steps that are always needed to treat a batch. At the beginning of the batch the agitator in the equalization tank must run for a few minutes to disperse the solids. Also, the treatment tank must be filled. Similarly, at the end of the batch, the treated water must be discharged. This is done through the decant and sludge discharge steps. But, in between the initial and final steps, there are a number of possible operations that perform the actual treatment of the wastewater. The sequence of these steps is selected to provide the best treatment.

With the system in auto, the water level in the equalization tank is continuously monitored to see if there is enough water to treat. When the tank level goes above the low-level probe, a batch automatically starts, providing that all selector switches are in auto, the last batch has finished, and there is dry product in the hopper.

TREATMENT FORMULA AND EQUALIZATION TANK SELECTION



The operator is able to choose which equalization tank the waste is to be pumped from, along with which formula he would like to treat with. The operator presses the formula select button located on the operator interface and selects which tank and formula to run. The operator can also change the selected formula and equalization tank for the next batch by selecting them here once a batch has started. On the next batch the unit will pump from the desired tank and treat per the selected formula.

The Treatment Formula and Equalization Tank Select Screen:

Current-	Formula 1
Next Formula	▶ Formula 1 Formula 2
Current	Stream A
Eq Tank	▶ Stream A Stream B

Once a batch starts, the following steps occur:

PRELIMINARY BATCH STEPS

The following two steps occur automatically prior to treatment.

EQUALIZATION TANK PRE-BATCH AGITATION

Before water is pumped from the equalization tank to the treatment tank, the equalization tank agitator runs for a period of time to ensure that any settled solids in the water are dispersed evenly.

The agitator will run only if the level is above the low-level probe. If the low-level condition is met the equalization tank agitator starts. At the same time, the "Pre-Batch Agitation Time" timer starts.

When the "Pre-Batch Agitation Time" timer has timed out, the equalization tank agitator stops and the treatment tank fill step begins.

TREATMENT TANK FILL

The influent transfer pump solenoid valve opens, causing the pump to transfer water from the equalization tank to the treatment tank.

The influent transfer pump continues to run until the treatment tank high level probe is satisfied. When the probe is satisfied, a timer will time out to prevent erroneous signals.

When this timer times out, the pump solenoid valve closes, the pump stops, and transfer is complete.

After transfer, the equalization tank agitator is controlled through the normal on/off cycle timers (see "Equalization Tank Agitator Cycle").

SELECTABLE STEPS

Once the treatment tank is full, the process moves on to the next step. The sequence of steps varies from system to system. These steps are defined in the Formula Editing section and listed in the table below. Refer to the "Formula Editing" section for a detailed description of these operations.

Operation	Value Range	Description
None	0	The system will skip this operation and move to the next
Check pH (optional)	0-140	Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75) The treatment tank agitator runs and the pH recirculation pump starts. After 30 seconds the system reads the pH level and determines if the pH level is near the value within its tolerance (tolerance is set on the "pH Check" menu option of the previous screen). An alarm will sound if the pH is too high (Alarm 10) or too low (Alarm 11)

Operation	Value Range	Description
Adjust pH (optional)	0-140	<p>Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75)</p> <p>The treatment tank agitator runs and the pH recirculation pump starts. After 30 seconds the system determines if acid or base is required to reach the value entered. If the pH of the treatment tank is lower than the value, base is added to raise the pH. If the pH of the treatment tank is higher than the value, acid is added to lower the pH</p> <p>In either case, if the pH is more than 2 pH (20 on the screen) away from the set point, the acid or base pump runs continuously. Once the pH is within 2 pH, the acid or base pump cycles on and off for accuracy.</p>
Treatment Powder Addition	0-900	<p>Treatment tank agitator runs and treatment powder auger starts and runs for number of seconds equal to value.</p> <p>Formulation Note: the treatment tank should be agitated prior to this step. Short runs of treatment powder in an un-agitated tank may result in treatment powder clumping in the treatment tank.</p>
Mix Slow (optional)	0-900	Treatment tank agitator runs slow using a variable speed drive for a number of seconds equal to the value
Mix	0-900	Treatment tank agitator runs at full speed for a number of seconds equal to the value
Settle	0-900	The system is idle for a number of seconds equal to the value. The agitator does not run.
Additive 1 (optional)	0-900	The agitator runs and the liquid additive 1 pump starts for a number of seconds equal to the value.
Additive 2 (optional)	0-900	The agitator runs and the liquid additive 2 pump starts for a number of seconds equal to the value.

FINAL STEPS

Once all selectable steps have finished, the following automatic steps occur:

BANDFILTER PRE-DECANT ADVANCE

The system advances the bandfilter to eliminate the sludge left from the last batch and provide clean filter media for the decant water. Once the time limit is completed, the system continues.

DECANT TIME

The decant valve opens allowing clear water to flow onto the bandfilter.

When the "Decant Time" timer times out the decant valve closes and the process moves on to the next step.

BANDFILTER PRE-SLUDGE ADVANCE

Once again, the bandfilter will advance to clear off any sludge and provide clean filter media for the sludge. After a programmed time, we move to the next step.

SLUDGE DISCHARGE STEP

When the decant step is done, the sludge valve opens, allowing sludge to flow onto the bandfilter. The dewatering cycle progresses until the tank is eventually emptied. Specifically, each time the sludge discharge valve opens a two-minute timer starts. If the sludge reaches the level probe before the timer ends, the timer resets and starts again the next time the valve opens. However, if the timer times out before the sludge reaches the probe it is assumed that the treatment tank is empty and the discharge cycle ends.

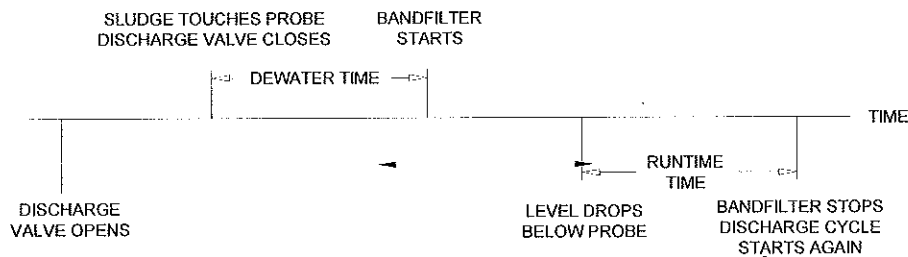
BANDFILTER OPERATION

This description of the bandfilter operation applies to both the decant and sludge discharge steps.

The treatment tank discharge valve (decant or sludge) opens to allow water and sludge to flow onto the bandfilter, and the fluid level typically rises. When the level reaches the bandfilter level probe, the treatment tank discharge valve closes. The sludge is then allowed to dewater for a time as determined by the

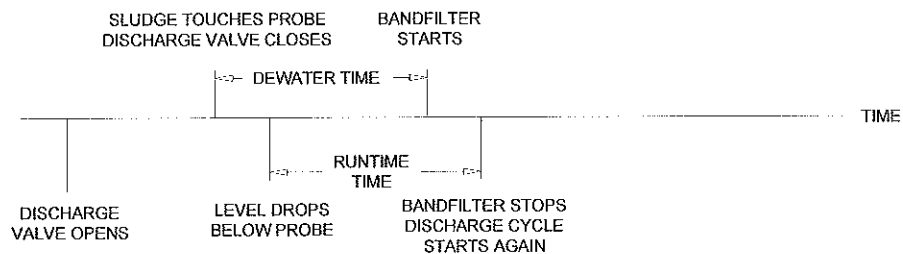
DEWATER TIME. When this timer ends, the bandfilter advances until the level drops below the probe. The bandfilter then continues to advance for a time as determined by the RUNTIME TIME to ensure that there is clean filter media available for the next discharge.

This shows how the cycle normally works with sludge:

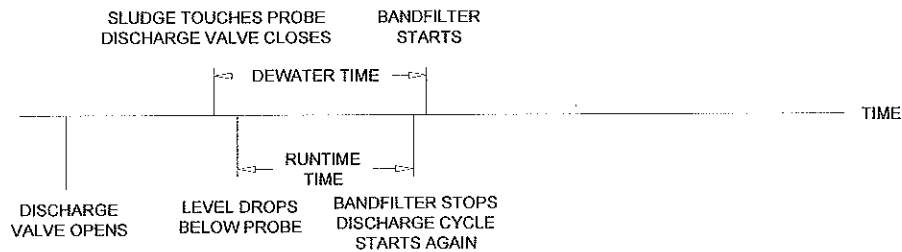


The DEWATER TIME and RUNTIME timers aren't tied together. RUNTIME (bandfilter extra advance time) starts timing as soon as the probe is uncovered, even if DEWATER TIME isn't timed out. The bandfilter starts when DEWATER TIME is done, and stops when RUNTIME times out. Since RUNTIME starts when the level drops below the probe, regardless of the status of DEWATER TIME, the bandfilter may not run for a long time when the water is clear and runs through the filter media easily. This helps conserve filter media and speeds the process along.

For example, the discharge valve opens and the level rises until it touches the probe. If the water is pretty clear at this point, it may go through the bandfilter quickly, uncovering the probe before the DEWATER TIME is done. As soon as the probe is uncovered, RUNTIME starts timing. So, if the level drops fast, the bandfilter won't advance much, if any. This is depicted as follows:



If the sludge dewateres very quickly, and RUNTIME is shorter than DEWATER TIME, the bandfilter may not run at all (it stops before it starts), as follows:



When the sludge step is completed, we move to the next step.

SPRAY WASH

After the sludge discharge step, a clean water valve opens and rinses the treatment tank of any remaining sludge. During this time, the sludge valve remains open to allow the rinse water to fall onto the bandfilter.

EFFLUENT PUMP

All treated water drips into the bottom, or effluent tank. The effluent pump will empty the effluent tank under two circumstances:

1. An automatic process completes its spray wash cycle and the effluent tank low level probe indicates there is water in the effluent tank.
2. The system was taken out of "Auto" mode while the effluent tank low level probe indicates there is water in the effluent tank.

Once one of these circumstances occurs, the effluent pump will activate and run until the effluent tank low level probe indicates the tank is empty and the effluent tank pump extended timer completes its time period.

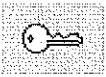
Note: The effluent pump runs independently of the automatic process. A new batch may be running while the effluent pump is still pumping the effluent water from the previous batch.

EFFLUENT TANK AUTO SPRAY WASH (OPTIONAL)

When the effluent tank low level probe sees that the effluent tank is empty, the spray wash comes on and sprays the tank for a preset amount of time. The effluent pump will continue to pump during this time to drain the tank.

CHANGING EQUIPMENT AUTOMATIC OPERATION

The system operates on a series of timers and counters. These timers and counters are, for the most part, accessible with a password.



To access the password screen press the key icon button just under the display. The display will ask for a password. Enter the password using the number keypad. If the password is not known, check with the operator or supervisor. Once the password is entered, press the return key to accept it.

The setup screen selection menu appears. Below is a list of menu selections and values they control.

- Edit Formula – see formula editing at the end of this section.
- Edit Password

▼ for User <div style="border: 1px solid black; padding: 2px; text-align: center;">#####</div> ▲ for New <div style="border: 1px solid black; padding: 2px; text-align: center;">NEW PASSWORD</div> ▼ for Verify <div style="border: 1px solid black; padding: 2px; text-align: center;">VERIFY PASSWORD</div>	←	Current Operator
	←	Press ▲ to enter new password
	←	Press ▼ to verify new password

- Edit Batch Control

Batch Control Batches to Run ## 99 for Continuous	←	Enter the number of batches to run automatically. Enter the number 99 for continuous operation.
---	---	---

- Batch Counter Reset

Batch Counter Batch ID #### Reset Batch ID <div style="border: 1px solid black; padding: 2px; display: inline-block;">▶ Yes</div>	←	Enter YES to reset batch totalizer to zero
--	---	--

- Equalization Tank Agitator (Optional)

```

Equalization Tank
  Agitator
Pre-Batch      #####
Cycle Enabled  |> Yes
Time ON       #####
Time OFF      #####
    
```

Prior to pumping to the treatment tank, EQ tank agitation is turned in for this time

"Yes" allows the cycle time on & off to run the EQ tank agitation
 "No" runs the agitator constantly while in Auto

When cycle is enable, EQ agitation is cycled on & off for these time periods

- pH Check (Optional)

```

pH Check
pH Tolerance
      +/- |###|
      pH x 10
    
```

pH tolerance refers to the acceptable range of the pH during a pH check operation

Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75)

- Treatment Tank

```

Treatment Tank
Fill Watchdog  #####
Batch WatchDog #####
    
```

This timer starts when the treatment tank begins to fill. If the timer times out before the tank is full, Alarm A5 will sound. This timer starts at the beginning of the batch. If this timer times out before the batch is completed, Alarm A6 will sound

- Treatment Tank Acid (Optional)

```

Treatment Tank Acid
Acid Pump ON   #####
Acid Pump OFF  #####
Failure Time   #####
    
```

If pH is within 2 pH (20 on the screen) during a pH adjust step and acid is required, the acid pump will cycle based of these timers

Alarm A8 will sound if set point is not reached within this time period

- Treatment Tank Caustic (Optional)

```

Treatment Tank
Caustic
Caustic Pump ON  [###]
Caustic Pump OFF [###]
Failure Time     [####]
    
```

If the pH is within 2 pH (20 on the screen) during a pH adjust step and base is required, the base pump will cycle based off these times

Alarm A9 will sound if the set point is not reached within this time period

- Effluent Tank

```

Effluent Tank
Low Extend Pump Time
                    [###]
    
```

This time allows the continued operation of the effluent pump after the effluent tank low level shows that tank empty. This ensures the tank drains completely

- Effluent Tank Liquid Additive (Optional)

```

Effluent Tank
Liquid Additive
Addition Time     [##]
    
```

During the decant process, this time will run to add liquid additive to the effluent tank

- Bandfilter

```

Bandfilter
Runtime Time      [###]
Dewater           [▶ Yes]
Dewater Time      [###]
    
```

During the discharge cycle, the bandfilter fills and activates the float. Once the float drops and releases the micro-switch the bandfilter will continue to run for the programmed time. This timer runs in seconds, enter the correct amount of time desired in seconds.

- Reuse Tank (Optional)

Reuse Tank	
Agitator ON	####
Agitator OFF	####
pH Setpoint	####
pH Cycle Time	####

The reuse tank agitator runs on a "time on" – "time off" cycle. This sets those times

The set point for pH adjustment of the reuse tank s entered here

Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75)

This time period is the time period between pH checks on the reuse tank

- Reuse Tank Acid (Optional)

Reuse Acid Pump	
Acid Pump ON	###
Acid Pump OFF	###
Failure Time	###

When acid is required to lower the pH of the reuse tank, it is pumped in using these "time on" – "time off" timers

Alarm A20 will sound if a pH adjustment starts but does not reach its set point within this time limit

- Reuse Tank Base (Optional)

Reuse Caustic Pump	
Caustic Pump ON	###
Caustic Pump OFF	###
Failure Time	###

When base is required to raise the pH of the ruse tank, it is pump in using these "time in" – "time out" timers

Alarm A21 will sound if a pH adjustment starts but does not reach its set point within this time limit

Other menu items appear but require a manufacturer's password to enter. Changes on these screens could result in unexpected equipment behavior. Please contact Ringwood Environmental, Inc. at 1-866-462-3826 should any of these screens need to be changed.

FORMULA EDITING



Before editing the formulas, a copy of the formula should be on hand for reference.

To edit the formula follow these steps:

1. Place the equipment in manual mode:

The formula edits will not be saved unless the equipment is in manual mode. To verify that equipment is in manual mode, the green "Auto" light should be off. If the equipment is in "Auto" (green light on), allow the system to complete the current batch and place the system in "Hold". When the system is in "Hold", the "Auto" light could be pressed to place the system in manual (green light off)



2. Select Formula:

This screen allows the operator to choose which formula the unit is using to treat the wastewater with. There are 15 different formulas that can be pre-programmed for different waste streams or characteristics. By using the Up/Down  arrow keys select which formula you would like run and press the  return key to accept.

A. The Screen:

```
Current Formula  Formula 12
Next Formula     Formula 10
                 Formula 11
                 Formula 12
```

3. Enter Password:

To access the password screen, press the key icon button  just under the display. This display will ask for a password, enter the password using the number keypad. If the password is not known, check with the operator or supervisor. Once the password is entered, press the return key to  accept it.

4. Select "Edit Formula" from Menu:

By using the Up/Down  arrow keys select "Edit Formula" from the top of the menu.  Press the return key to accept.

5. Edit the Formula:

A formula is a preprogrammed sequence of steps that the machine executes after filling the treatment tank. There are a total of 14

programmable steps per formula. Formulas also include discharge parameters that tell the equipment how long to keep the sludge and decant valves open.

A. The Screen:

```

Step Operation Value
## [Liqui*] #####
## [Adjust pH] #####
## [Mix Slow] #####
Formula 1 [ ] SCROLL [ ]
    
```

The step in the center is the current editable step. The formula number is indicated in the lower left corner.

Note: Changing the formula select switch at this point will not change the formula being edited.

B. Operations & Values:

Below is a table of available operations, reasonable values for those operations, and how the system uses those operations.

Note: Below is a list of all operations including those associated with optional equipment. The optional operations may not appear in systems which do not have those options installed.

Operation	Value Range	Description
None	0	The system will skip this operation and move to the next
Check pH (optional)	0-140	<p>Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75)</p> <p>The treatment tank agitator runs and the pH recirculation pump starts. After 30 seconds the system reads the pH level and determines if the pH level is near the value within its tolerance (tolerance is set on the "pH Check" menu option of the previous screen). An alarm will sound if the pH is too high (Alarm 10) or too low (Alarm 11)</p>

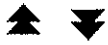
Operation	Value Range	Description
Adjust pH (optional)	0-140	<p>Note: pH level is represented in the screen without a decimal point and to the tenths position (i.e. 7.5 pH is shown as 75)</p> <p>The treatment tank agitator runs and the pH recirculation pump starts. After 30 seconds the system determines if acid or base is required to reach the value entered. If the pH of the treatment tank is lower than the value, base is added to raise the pH. If the pH of the treatment tank is higher than the value, acid is added to lower the pH</p> <p>In either case, if the pH is more than 2 pH (20 on the screen) away from the set point, the acid or base pump runs continuously. Once the pH is within 2 pH, the acid or base pump cycles on and off for accuracy.</p>
Treatment Powder Addition	0-900	<p>Treatment tank agitator runs and dry product auger starts and runs for number of seconds equal to value.</p> <p>Formulation Note: the treatment tank should be agitated prior to this step. Short runs of dry product in an un-agitated tank may result in dry product clumping in the treatment tank.</p>
Mix Slow (optional)	0-900	Treatment tank agitator runs slow using a variable speed drive for a number of seconds equal to the value
Mix	0-900	Treatment tank agitator runs at full speed for a number of seconds equal to the value
Settle	0-900	The system is idle for a number of seconds equal to the value. The agitator does not run.
Additive 1 (optional)	0-900	The agitator runs and the liquid additive 1 pump starts for a number of seconds equal to the value.
Additive 2 (optional)	0-900	The agitator runs and the liquid additive 2 pump starts for a number of seconds equal to the value.

C. Editing the Step:



To change the operation, use the "Operation Cycle" button. Each press cycles to the next available operation step.

To edit that value, simply key the new value using the numerical keypad.

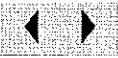


To move to the next or previous step, use the "Double Arrow Up/Down" buttons. Each press of a button will move the step up or down one.

D. Editing Discharge Parameters:



While in the formula edit screen, pressing the "key" button will change screens to the discharge parameter screen. Here the bandfilter pre-decant advance timer, decant timer, bandfilter pre sludge advance timer, sludge discharge timer, and treatment tank spray wash timer are entered. Use the left and right arrow keys to cycle between the values and the keypad to enter new values. Press the "key" button to return to formula edit screen.



E. Returning to the Main Screen:



In the formula edit screen, pressing the "main" screen button will return to the operation and save changes made to the formula.

ALARM DESCRIPTIONS AND TROUBLESHOOTING GUIDE

The following alarms are present to alert the operator when the system is not operating correctly. Some alarms are always active, others only at certain times or under certain conditions. The following alarm descriptions outline the conditions under which each alarm is active. If an alarm is triggered, the following occurs:

- The buzzer sounds and the light on the ALARM ACKNOWLEDGE pushbutton is lit.
- If in auto, the system goes into hold. (See "System Controls" for a description of what happens in hold.)

Press the ALARM ACKNOWLEDGE pushbutton to silence the buzzer. The light on this button will flash to signal that an alarm condition is still present. The alarm condition must be eliminated before the system can be put back into automatic operation. To remove the alarm condition, operate the system manually and follow the steps described below in the appropriate Troubleshooting Tips.

Alarm A1



- A1 -
Equalization Tank
Overfilled

AUTOMATIC **RUNNING**

Description:

The equalization tank overflow probe is monitored continuously whether in auto or not. If the level in the equalization tank reaches the overflow probe, the alarm is triggered.

This alarm will not put the system on hold. The alarm buzzer will sound (momentarily, every minute), but the treatment process will continue.

Troubleshooting Tips:

- Stop all pumps that feed the equalization tank. A relay contact is available for customer use to automatically turn off the pumps that feed the equalization tank. Refer to the electrical schematic drawings to locate the terminals for this contact.
- The treatment system should be checked to make sure that batches are being treated. Verify that the system is in AUTO, that all the switches are in AUTO, and that it is not on HOLD. If the system is still not starting batches automatically, there may be a problem with the equalization tank batch start level probe, since this probe is responsible for initiating a batch.
- If this alarm occurs and the level is below the overfill probe, there may be a problem with the probe.

A qualified technician should examine the probe to ensure that the switch inside changes state when the probe is turned up and down (cord on bottom or cord on top).

Alarm A2**Description:**

The Equalization Tank agitator overload is monitored anytime that the agitator is supposed to be running. If the overload trips, this alarm is triggered.

Troubleshooting Tips:

- Anything that will cause the load on the motor to increase will cause this alarm. Check for mechanical problems, such as bad bearings or binding on the shaft or propeller.
- After making sure that the shaft should be able to turn freely, a qualified technician should reset the overload inside the control panel. Try to run the agitator manually by turning the switch on the control panel door to ON.

- If the overload trips again, the motor and gearbox should be examined for damage and repaired or replaced as needed.

Alarm A3**Description:**

The selector switches on the control panel are monitored continuously whenever the system is in auto. If a switch is turned to any position besides AUTO, this alarm is triggered.

Troubleshooting Tips:

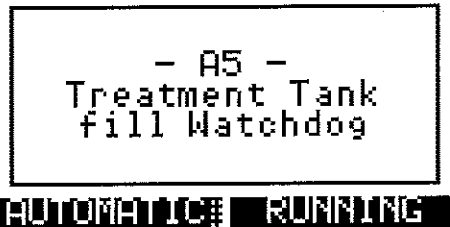
- Put all switches in AUTO to continue.
- If all switches are in the AUTO position and this alarm is still present, there is an electrical problem with a switch. A qualified technician should troubleshoot the wiring and switches. Refer to the electrical schematic drawings for assistance.

Alarm A4**Description:**

The " Maximum Batch Time" timer starts when the batch does. The first step of the batch is the Equalization Tank Pre-Batch Agitation, and the last step is the Sludge Discharge. If the batch is not completed within this time, the alarm is triggered.

Troubleshooting Tips:

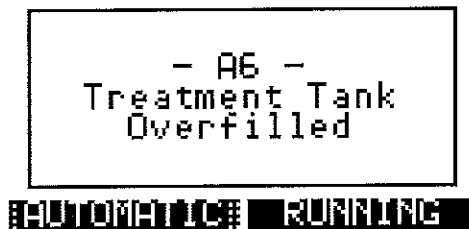
- This alarm is caused by some part of the process taking too long. If the pH steps cause alarms then this alarm may sound toward the end of the batch.

Alarm A5**Description:**

The "Influent Pump Maximum Time" timer starts with the treatment tank automatic fill cycle. If the treatment tank is not filled within this time, the alarm is triggered.

Troubleshooting Tips:

- Check that there are no manual valves closed either in the influent water line or airline to the influent transfer pump.
- Check that the influent transfer pump is operating correctly by running it manually. If the pump doesn't run in manual, check that there is air pressure to the pump. If so, there may be a problem with the solenoid valve.

Alarm A6**Description:**

The treatment tank overflow probe is monitored continuously during a batch, whether in auto or not. If the level in the treatment tank reaches the overflow probe, the alarm is triggered.

Troubleshooting Tips:

- If the tank has overflowed, there may be a problem with the treatment tank full level switch, since it did not stop the influent transfer pump like it is supposed to.
- If the treatment tank level is below the overflow probe and this alarm occurs, there is likely a problem with the overflow probe.
- There could also be a problem with the influent transfer pump solenoid valve. It may have stuck open, causing the pump to continue to run.

Alarm A7

```
      - A7 -  
Treatment Tank  
Agitator Overload
```

```
AUTOMATIC RUNNING
```

Description:

The Treatment Tank agitator motor overload is monitored anytime that the agitator is supposed to be running. If the overload trips, the alarm is triggered.

Troubleshooting Tips:

- Anything that will cause the load on the motor to increase will cause this alarm. Check for mechanical problems, such as bad bearings or binding on the shaft or propeller.

Alarm A8

```
      - A8 -  
Treatment Tank  
Acid Delivery  
Failure
```

```
AUTOMATIC RUNNING
```

Description:

The "acid addition too long time" timer starts with the automatic acid addition step. If the timer times out before the pH set point is reached, the alarm is triggered.

Troubleshooting Tips:

Warning: Always follow OSHA guidelines and wear appropriate protective equipment when working near acid. Acid drums and related equipment should not be handled by anyone who is not familiar with OSHA Safety Guidelines (training and guidelines supplied by customer training program).

- The most likely cause of this alarm is that the acid drum is empty. Check that the drum has acid in it and that the siphon tube is all the way in. Replace the drum if needed.
- If there is acid in the drum then there may be a problem with the acid pump. Try to operate the pump manually by turning the switch on the front of the control panel to ON. If the pump strokes but does not pump the acid, then the pump may have lost its prime or there is a leak in the line.
- If the pump does not strike, there could be a problem in the pump. Repair or replace as needed.

Alarm A9**Description:**

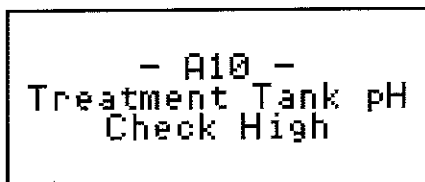
The "Base addition too long time" timer starts with the automatic base addition step. If the timer times out before the pH set point is reached the alarm is triggered.

Troubleshooting Tips:

Warning: Always follow OSHA guidelines and wear appropriate protective equipment when working near base. Base drums and related equipment should not be handled by anyone who is not familiar with OSHA Safety Guidelines (training and guidelines supplied by customer training program).

- The most likely cause of this alarm is that the base drum is empty. Check that the drum has base in it and that the siphon tube is all the way in. Replace the drum if needed.
- If there is base in the drum then there may be a problem with the base pump. Try to operate the pump manually by turning the switch on the front of the control panel to ON. If the pump strokes but does not pump the base, then the pump may have lost its prime or there is a leak in the line.
- If the pump does not strike, there could be a problem in the pump. Repair or replace as needed.

Alarm A10



```
- A10 -  
Treatment Tank pH  
Check High
```



```
AUTOMATIC RUNNING
```

Description:

This alarm is activated if the pH check step is selected in the equipment setup listing for your system's Sequence Of Operation (see "Detailed Process Step Description"). If the pH does not get checked, then this alarm is not active. If active, at the end of the pH probe recirculation timer, the pH value of the water in the treatment tank is compared against the high set point in the pH analyzer. If the actual pH is above the set point, the alarm is triggered.

Troubleshooting Tips:

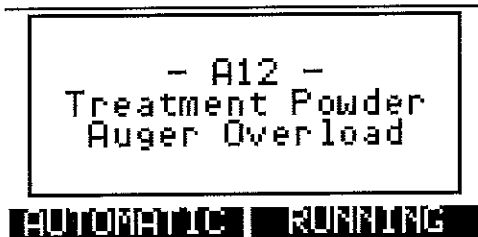
- Check the pH of the influent water with a handheld pH probe or check the calibration of the pH probe in the pH recirculation line on top of the treatment tank. This is to verify that the pH of the water really is higher than normal.
- If the pH is indeed high, the batch may need special attention to verify that it treats correctly. Check for floc separation after treating. If the water is not treated, lower the pH by manually adding acid, then add more RM-10. Make sure that the water is treated before decanting or discharging sludge.
- If the pH probe is out of calibration, calibrate it.

Alarm A11**Description:**

This alarm is activated if the pH check step is selected in the equipment setup listing for your system's Sequence Of Operation (see "Detailed Process Step Description"). If the pH does not get checked, then this alarm is not active. If active, at the end of the pH probe recirculation timer, the pH value of the water in the treatment tank is compared against the low set point in the pH analyzer. If the actual pH is above the set point, the alarm is triggered.

Troubleshooting Tips:

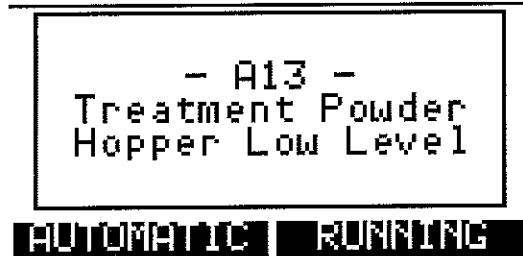
- Check the pH of the influent water with a handheld pH probe or check the calibration of the pH probe in the pH recirculation line on top of the treatment tank. This is to verify that the pH of the water really is lower than normal.
- If the pH is indeed out of tolerance, the batch may need special attention to verify that it treats correctly. Check for floc separation after treating. If the water is not treated, raise the pH by manually adding base, then add more dry treatment powder. Make sure that the water is treated before decanting or discharging sludge.
- If the pH probe is out of calibration, calibrate it.

Alarm A12**Description:**

The Dry treatment powder hopper auger motor overload is monitored while the auger is supposed to be running. If the overload trips, the alarm is triggered.

Troubleshooting Tips:

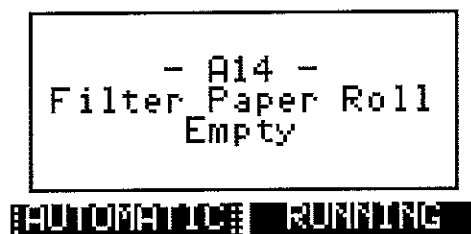
- Anything that will cause the load on the motor to increase will cause this alarm. Check for mechanical problems, such as bad bearings or binding on the shaft or propeller.

Alarm A13**Description:**

The treatment powder hopper low level probe is checked as a condition for a batch to start. If the level is low, the batch will not start and the alarm will be triggered. Treatment powder must be added to cover the probe. Place a new bag of Dry product on top of the hopper for the batch to start.

Troubleshooting Tips:

- If there is sufficient treatment powder in the hopper to cover the low-level probe and the alarm is triggered, there is probably a problem with the probe. Check it and replace if needed.

Alarm A14**Description:**

The filter media photo eye checks for the presence of filter media during decant and sludge discharge steps.

Troubleshooting Tips:

- The most likely cause for this alarm is that the media roll is empty. Replace it and continue the batch.
- If the roll is not empty then there may be a problem with the media sensor. The sensitivity of the sensor may be too low, or it may need to be replaced.

Alarm A17

- A17 -
Effluent Tank not
Empty

AUTOMATIC RUNNING

Description:

During the following batch, at the start of the decant step, the effluent tank is checked to see if it is empty according to the effluent tank level probe. If the tank is not empty at this time, this alarm is triggered.

Troubleshooting Tips:

- Check that there are no manual valves closed either in the effluent water line or airline.
- Check that the effluent drain valve or transfer pump is operating correctly by running it manually. If the drain valve or pump doesn't run in manual, check that there is air pressure. If so, there may be a problem with the solenoid valve.
- If the effluent tank is empty and this alarm occurs, there is likely a problem with the low-level probe.

Alarm A18

- A18 -
Sump Full Alarm

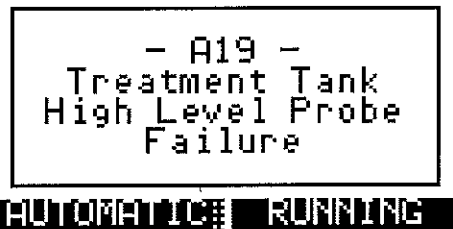
AUTOMATIC RUNNING

Description:

An input is provided for a sump overflow alarm input. This will not stop the process or put the system in hold. A short burst from the alarm horn every minute indicates this alarm.

Troubleshooting Tips:

- Check that the sump pumps are operating correctly and that no manual valves are closed.
- Have a qualified technician check the operation of the level probe and input.

Alarm A19**Description:**

When the system starts the sludge discharge portion of the batch after decant discharge and the treatment tank high level probe is active showing the treatment tank still full, this alarm sound to indicate a problem with the decant process.

Troubleshooting Tips:

- Check the treatment tank:
 - If level is high, check the decant valve by manually opening it with the control panel switch
 - If level is at the stand pipe, check the full level probe for proper operation

Alarm A20

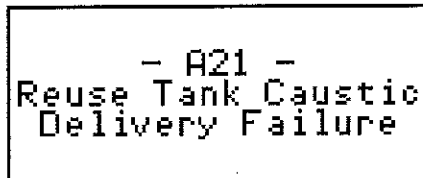
Description:

The reuse tank started a pH adjustment, but the failure timer completed before the set point was reached.

Troubleshooting Tips:

Warning: Always follow OSHA guidelines and wear appropriate protective equipment when working near acid. Acid drums and related equipment should not be handled by anyone who is not familiar with OSHA Safety Guidelines (training and guidelines supplied by customer training program).

- The most likely cause of this alarm is that the acid drum is empty. Check that the drum has acid in it and that the siphon tube is all the way in. Replace the drum if needed.
- If there is acid in the drum then there may be a problem with the acid pump. Try to operate the pump manually by turning the switch on the front of the control panel to ON. If the pump strokes but does not pump the acid, then the pump may have lost its prime or there is a leak in the line.
- If the pump does not strike, there could be a problem in the pump. Repair or replace as needed.

Alarm A21

- A21 -
Reuse Tank Caustic
Delivery Failure



AUTOMATIC RUNNING

Description:

The reuse tank started a pH adjustment, but the failure timer completed before the set point was reached.

Troubleshooting Tips:

Warning: Always follow OSHA guidelines and wear appropriate protective equipment when working near base. Base drums and related equipment should not be handled by anyone who is not familiar with OSHA Safety Guidelines (training and guidelines supplied by customer training program).

- The most likely cause of this alarm is that the base drum is empty. Check that the drum has base in it and that the siphon tube is all the way in. Replace the drum if needed.

- If there is base in the drum then there may be a problem with the base pump. Try to operate the pump manually by turning the switch on the front of the control panel to ON. If the pump strokes but does not pump the base, then the pump may have lost its prime or there is a leak in the line.

- If the pump does not strike, there could be a problem in the pump. Repair or replace as needed.

pH PROBE CALIBRATION PROCEDURE

This procedure uses the 2 Point Buffer method described in the Shark manual and requires you to enter the known pH values of two pH buffers. Follow these steps:

1. Immerse the sensor in the first buffer. Important: Allow the sensor and buffer temperatures to equalize. Depending on their temperature differences, this may take 30 minutes or more. When ready, press the DOWN key to display "CALIBRATION".
2. Press the <> key to display "MANUAL CAL PH".
3. Press the <> key again to display "IF BUFFER 1 READY PRESS 'DOWN'".
4. Press DOWN. Once the DOWN key is pressed the controller will read the pH value, averaging a number of results to get a stable calibration value. The display will read "RUNNING MANU CAL BUFFER 1 WAIT....."
5. Please wait for the controller to complete the measurement. When complete, the controller will report the measured value. Use the UP and DOWN keys to adjust the reading until it agrees with the actual buffer pH value. The display will read "MANUAL CAL pH BUFFER 1 x.xx>." Then use the <> key to move the cursor to the RH (>) position and press the DOWN key to store the value and move to Buffer 2.
6. Remove the probe from the first buffer. Clean and rinse the probe with clean water and then insert it in the second buffer. The display will read "IF BUFFER 2 READY PRESS 'DOWN'". Press the DOWN key.
7. The controller will read the pH value, averaging a number of results to get a stable calibration value. Please wait for the controller to complete the measurement. The display will read "RUNNING MANU CAL BUFFER 2 WAIT...."
8. Please wait for the controller to complete the measurement. When complete the controller will report the measured value. Use the UP and DOWN keys to adjust the reading until it agrees with the actual buffer pH value. The display will read "MANUAL CAL pH BUFFER 2 x.xx>." Then use the <> key to move the cursor to the RH (>) position and press the DOWN key to store the value and complete the manual calibration.
9. After 5 seconds, the controller will compute the slope of the calibration, the estimated probe efficiency and the probe temperature. The display will read something like "SLOPE 61.22mV/pH EFF 95% 24.8C". The slope should be between 50 and 62 mV/pH and above 80% efficiency for optimal sensor performance. Typically, as the sensor ages and/or becomes dirty, its slope decreases. When the slope is less than 54mV/pH, clean the sensor to improve its performance and consider replacing it.
10. If the calibration is okay, use the <> key to move the cursor over the "Y" text and press the DOWN key to store the calibration and return to the MANUAL CAL menu so the user can select another function. If the calibration did not appear to be correct, select the "N" text to return to the calibration menu and repeat the procedure.
11. When finished with the calibration, press the UP and DOWN keys at the same time to return immediately back to the run mode.

FILTER MEDIA ROLL CHANGE PROCEDURE

The following steps are required to replace an empty filter media roll:

1. Remove the locking pins and swing the ladder out of the way.
2. Remove the locking pin, reach in and lift up on the shaft, and swing the shaft cradle out of the way.
3. Using a ¼" Allen wrench, loosen the setscrew on the media shaft collar. Slide the collar off the shaft.
4. Slide the old media roll off the shaft.
5. Install the new media roll such that the media will feed out from the bottom of the roll. Slide the new roll onto the shaft until it hits the far shaft collar. The collars are positioned such that they hold the media roll centered on the bandfilter.
6. Slide the shaft collar back onto the media shaft and tighten the setscrew.
7. Swing the shaft cradle back into place and replace the locking pin. Swing the ladder back into place and replace the locking pins.
8. Unroll the filter media from the roll and overlap it with the trailing edge of the existing piece. Wet both pieces and they should stick together well enough. If not, it may be necessary to tape the new piece to the old one.
9. Run the bandfilter manually by turning the switch on the front of the control panel to ON. Watch the new media to make sure that it feeds under the side aprons without snagging.
10. When the new media has gone through the squeeze rollers, turn the bandfilter off and return the system to automatic.

MAINTENANCE SCHEDULE AND PROCEDURES

The following maintenance tasks are listed to ensure that all equipment is provided with the minimum attention necessary to ensure proper operation. Should you encounter equipment difficulties that exceed routine maintenance tasks, please refer to the vendor information at the end of this manual.

PLEASE NOTE: *Under no circumstances should your equipment be modified or worked on by anyone who is not familiar with OSHA Safety Guidelines: (Training and guidelines supplied through the customer's own training program.)*

Before working on any equipment listed below, ensure that all utilities are at a zero energy state. The zero energy state conditions require that all electrical power is disconnected and locked out, all air pressure is exhausted from air lines, steam is evacuated to zero pressure with valves closed, and that interconnected equipment is idled.

EQUALIZATION TANK

Agitator – Monthly check the oil level in gearbox.

Diaphragm Pumps – Weekly check the oil level in the airline lubricator and set for 1 drop per minute while the pump is running. Use SAE 90 wt. Non-detergent oil Supplied by customer.

Level probes - Weekly check the probes for material buildup and clean if necessary.

Solenoid valve for Diaphragm Pump - Monthly check for sluggish valve operation, excessive leakage, or noise.

CE SYSTEM

Tanks – Weekly wash out treatment and effluent tanks to minimize build-up.

Treatment Powder Hopper Auger - Monthly check the oil level in gearbox.

pH Recirculation Diaphragm Pump (Optional Equipment) - Weekly check the oil level in the airline lubricator and set for 1 drop per minute while the pump is running. Use SAE 90 wt. Non-detergent oil

Acid and Base Pumps (Optional Equipment) – Weekly check for leaks.

pH probes (Optional Equipment)

- Weekly check probe, accuracy and clean if necessary (see “pH Probe Inspection and Accuracy Check” procedure).
- Every 3 months clean and recalibrate (see “pH Probe Calibration” procedure).

Level probes - Weekly check the probes for material buildup and clean if necessary.

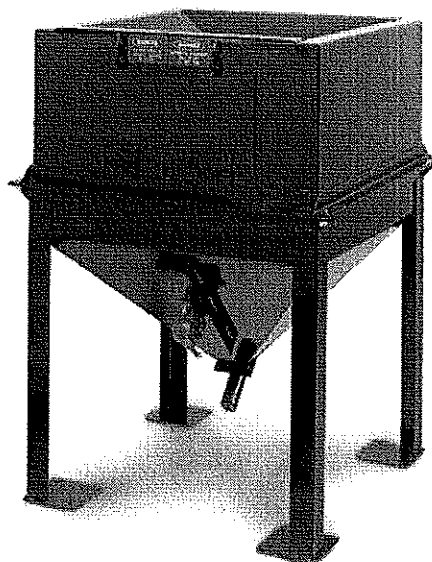
Solenoid valves - Monthly check for sluggish valve operation, excessive leakage, or noise.

Valve actuators - Monthly check for sluggish valve operation, excessive leakage, or noise.

Bandfilter Bearings – Monthly add grease.

Bandfilter Gearmotor - Monthly check the oil level in gearbox.

TREATMENT POWDER HOPPER AND AUGER INSTALLATION GUIDE



 **Ringwood**
Environmental, Inc.

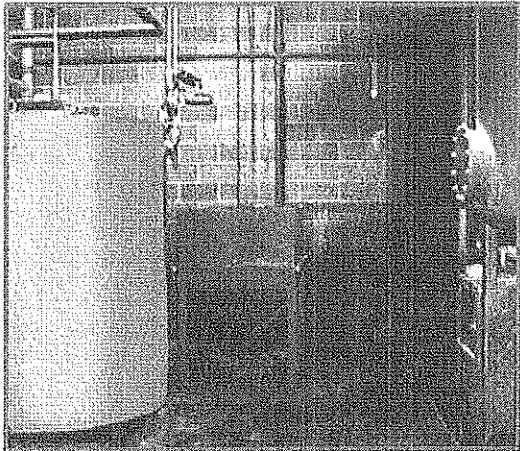


Photo 1

Locate the hopper (see photo 1) in a convenient location based on the layout drawing (if available) or on the following guidelines:

Superbag hopper should be accessible by forklift to place a superbag on top.

Hopper should be located on the same side of the CE System as the auger drive.

Distance from the treatment tank to the hopper should be between 3 and 10 feet.



Photo 2

Mount the drive assembly to the top of the CE System (if not already done). Use four bolts, nuts and lock washers to attach it to the top of the tank. Center and align the drive over the square hole and tighten the nuts.

Unbolt and remove the cover plate on the auger drive housing (see photo 2).

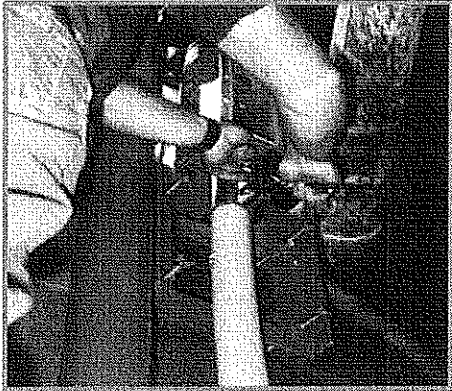


Photo 3

Attach one end of the plastic tube to the drive housing using the gasketed coupling. Be sure to push the tube all the way up to the metal tube on the housing. Center the coupling over both pieces of tube and tighten the bolt on the coupling (see photo 3).

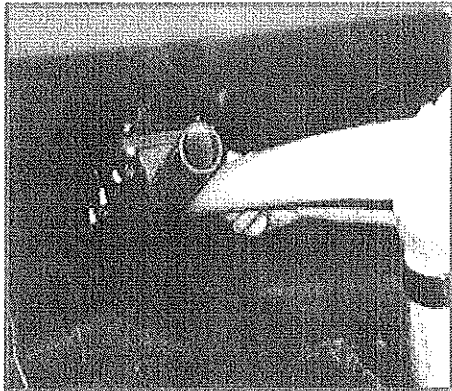


Photo 4

Hold the other end of the tube to the discharge tube of the hopper. Try to bend the tube such that there is a gentle curve without excessive stress at either end. If the tube is not long enough to reach the hopper, extend it by using the other piece of tube and joining the two with the gasketed coupling. Center the coupling over both pieces of the tube and tighten the bolts on the coupling. Mark the plastic tube where it will join the hopper discharge tube. This is where the tube will be cut (see photo 4).

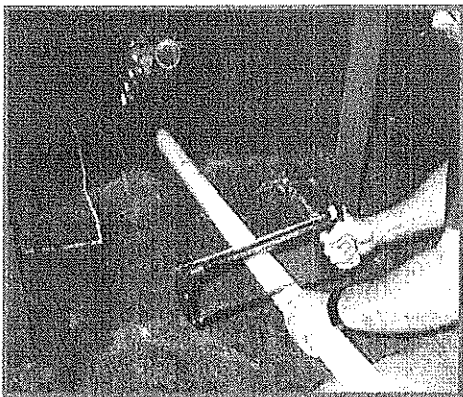


Photo 5

Use a hacksaw to cut the plastic tube at the mark (see photo 5).

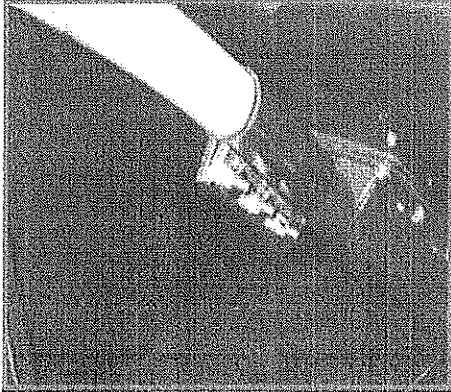


Photo 6

Attach the plastic tube to the hopper discharge tube using the gasketed coupling. Be sure to butt it up to the metal discharge tube on the hopper. Center the coupling over both pieces of tube and tighten the bolts on the coupling (see photo 6).

Adjust the position of the hopper if necessary to provide a smooth sweep of the tube. Then anchor the hopper to the floor.

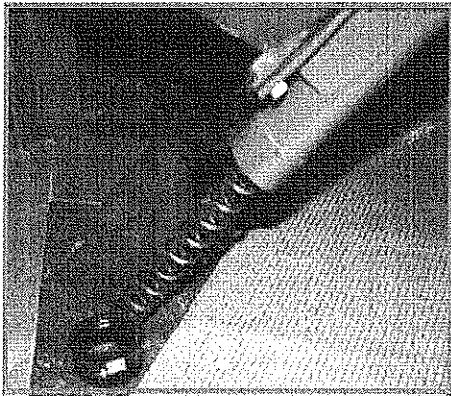


Photo 7

Thread the spiral flighting through the tube, starting at the bottom of the hopper. Push it all the way through until it reaches the drive housing. In the drive housing, line up the end of the flighting with the clamping bolt on the stub shaft, and turn the flighting to thread the tip of the flighting through the clamping bolt just enough to hold it in place. Do not thread it all the way through. Down at the hopper, mark the flighting in line with the bottom end of the discharge tube (see photo 7). Back out the flighting and use a hacksaw or bolt-cutter to cut the flighting at the mark.

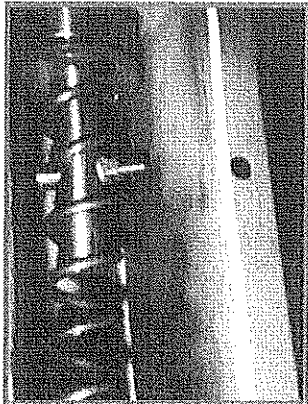


Photo 8

Thread the flighting through the hole in the clamping bolt on the stub shaft and continue until it hits the coupling (see photo 8). Tighten the clamping bolt. At the bottom of the hopper, the end of the flighting should be about 2" in from the bottom end of the steel discharge tube. If using a powder in this hopper (not common), thread the solid plastic rod through the center of the spiral flighting until it hits the stub shaft in the drive housing. Two or more pieces of rod can be butted up to one another as necessary. Cut the rod to size as necessary.

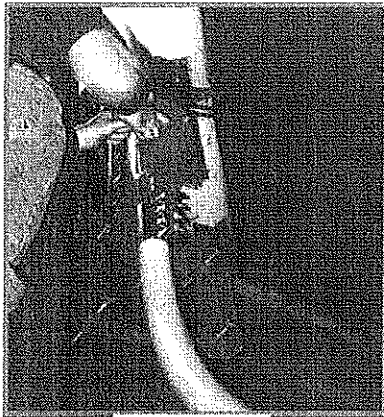


Photo 9

Replace the cover plate on the auger drive housing and tighten the bolts (see photo 9).

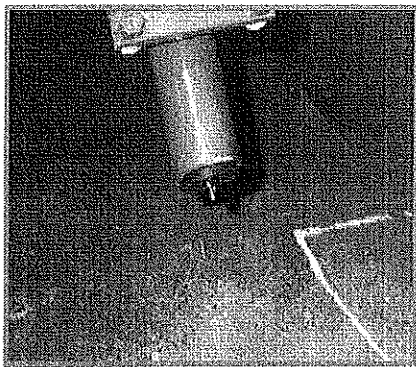


Photo 10

At the hopper, insert the plug in the bottom end of the steel discharge tube, making sure it doesn't touch the flighting. Tighten the wingnut to secure it in place (see photo 10).

Run 3/8" flexible tubing from the air feed on the CE System to the vibrator on the hopper. Use cable ties to attach it to the auger tube.

CE Wastewater Treatment System Spare Parts List

Quantity	Description	Part #	Cost
1	Bandfilter Drive DC Motor *	4190153	\$ 487.00
1	Bandfilter Drive Board *	4190173	\$215.00
1	Bandfilter Drive Resistor *	3320028	\$8.64
1	Bandfilter Level Probe	5830030	\$621.00
1	Treatment Powder Hopper Level Probe	5830166	\$186.00
13'	Treatment Powder Auger Screw Flighting *	2190008	\$442.00
1	Filter Media Alarm Photo Switch	5830134	\$222.00
1	Float-Type Level Switch	5830110	\$50.00
1	Treatment Tank Overfill Level Switch	5630108	\$56.00
1	Panelview Operator Interface	5700140	\$958.00
1	Solenoid Valve for Diaphragm Pump *	7501	\$107.00
1	Solenoid Valve for Treatment Tank Discharge Valves *	4280040	\$194.00
1	3" Actuated Decant Discharge Valve	2160749	\$614.00
1	4" Actuated Sludge Discharge Valve	2160743	\$814.00
1	Acid / Caustic Metering Pump *	5410176	\$432.00
1	Solenoid Valve for Acid / Caustic Metering Pump *	7504	\$108.00
1	pH Probe- Aquametrix *	5830180	\$312.00
1	pH Analyzer- Aquametrix *	5830189	\$1,190.00
1	pH Buffer - 4.01 (Box of 20)	5830063	\$38.00
1	pH Buffer - 7.00 (Box of 20)	5830069	\$38.00
1	pH Buffer - 10.00 (Box of 20)	5830064	\$38.00
1	pH Recirculation Pump	5410138	\$1292.00
1	Wet End Repair Kit for pH Recirculation Pump *	5410141	\$450.00
1	Air End Repair Kit for pH Recirculation Pump *	5410113	\$72.00

Notes:

- * Noted items are considered critical to run the system manually through the switches on the control

- panel. To be able to maintain automatic operation of the system, all parts should be purchased.
2. Other parts necessary to run the system (3 phase motors, for example) are not listed since these should be readily available from local suppliers.
 3. Delivery is subject to availability of parts at time of order.
 4. Depending on equipment purchased, some items may also appear on additional Spare Parts Lists.

Appendix E: February 26, 2016 Letter from City of Winnipeg and Results of Analyses



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Water and Waste Department • Service des eaux et des déchets

February 26, 2016

JASON HENKEL
GFL ENVIRONMENTAL WEST CORP.
1090 KENASTON BOULEVARD
WINNIPEG MB R3E 0R7

Document ID: IWSB-PP-877
NAICS Code: 562210

Sewer By-law No. 92/2010
Pollution Prevention Plan No Longer Required

Dear Jason Henkel:

Based on the analytical results from our inspection at 1090 Kenaston Boulevard on February 11, 2016, we no longer require GFL Environmental West Corp. to prepare and submit Pollution Prevention Planning documents.

Analysis of the sample we collected shows that your wastewater is within the limits set out in the Schedules of the by-law. Please see the attached table for the results of our analysis.

We will continue to periodically monitor the wastewater discharges from 1090 Kenaston Boulevard. If the discharges exceed any of the limits in Schedules A, B, C, and D, we will re-evaluate the requirement for GFL Environmental West Corp. to participate in the Pollution Prevention Planning Program.

Information on Pollution Prevention Planning, including form templates, is available on our website at winnipeg.ca/waterandwaste/sewage/pollutionprevention

If you have any questions, please contact one of our Pollution Prevention Program Inspectors.

Brett Zastre
Phone: 204-986-8407
Email: BZastre@winnipeg.ca

Jenny Khounnasene
Phone: 204-986-8350
Email: JKhounna@winnipeg.ca

Regards,

Meghan Marsland
Industrial Waste Services Branch Head
Environmental Standards Division

Wastewater Sampling Results

Company: GFL Environmental West Corp.

Sample Name: GRE 5

Sample Location: Holding Tank

Sample Type: Grab

Date Sampled: 11-Feb-16

Parameter	Sewer By-Law Limit (mg/L)	Sample Result (mg/L)	Comments
Aldrin / dieldrin	0.0002	<0.002**	
Aluminum (total)	50	<0.050	
Antimony (total)	5	<0.0020	
Arsenic (total)	1	<0.0020	
Benzene	0.5	<0.00050	
Biochemical oxygen demand*	300	71	
Cadmium (total)	0.7	0.00017	
Chlordane (cis plus trans isomers)	0.1	<0.002	
Chromium (hexvalent)	2	<0.01	
Chromium (total)	4	<0.010	
Cobalt (total)	5	<0.0020	
Copper (total)	2	0.0622	
Cyanide (total)	2	<0.0020	
1,1,2,2 Tetrachloroethane	1.4	<0.00050	
1, 2 - dichlorobenzene	0.05	<0.014	
1,4 - dichlorobenzene	0.08	<0.014	
3,3 - dichlorobenzidine	0.002	<0.014**	
Dichlorodiphenyltrichloroethane (DDT)	0.0001	<0.002**	
Cis - 1, 2 - dichloroethylene	4	<0.00050	
Ethyl benzene	0.16	<0.00050	
Fluoride	10	0.995	
Hexachlorobenzene	0.0001	<0.0014**	
Hexachlorocyclohexane (Lindane)	0.1	<0.001	
Lead (total)	1	0.00180	
Manganese (total)	5	0.0390	
Mercury (total)	0.01	<0.00020	
Methylene chloride	2	<0.0050	
Mirex	0.1	<0.001	
Molybdenum (total)	5	0.0037	
Nickel (total)	2	<0.020	
Nitrogen (total)*	60	55.2	
Nonylphenols	0.02	<0.001	
Nonylphenol ethoxylates	0.2	<0.002	
Animal or vegetable oil	100	10.1	

Wastewater Sampling Results

Company: GFL Environmental West Corp.

Sample Name: GRE 5

Sample Location: Holding Tank

Sample Type: Grab

Date Sampled: 11-Feb-16

Parameter	Sewer By-Law Limit (mg/L)	Sample Result (mg/L)	Comments
Mineral or synthetic oil	15	7.5	
Pentachlorophenol (PCP)	0.01	<0.018	
Phenolics (total by 4AAP method)	1	<0.50	
pH	5.5 to 11	7.71	
Phosphorus (total)*	10	4.89	
Polychlorinated biphenyls (PCBs)	0.001	<0.00030	
Polycyclic aromatic hydrocarbons (PAHs)	0.005	<0.034**	
Selenium (total)	1	<0.010	
Silver (total)	5	<0.0010	
Sulphate (total)	1500	58.4	
Sulphide	1	<0.020	
Suspended Solids (total)*	350	25.0	
Tetrachloroethylene	1	<0.00050	
Tin (total)	5	<0.0020	
Titanium (total)	5	<0.0050	
Toluene	0.024	0.00051	
Total Purgeable Hydrocarbons	10	<0.10	
Total Semivolatile Hydrocarbons	100	4.07	
Trichloroethylene	0.4	<0.00050	
Xylenes (total)	1.4	<0.0015	
Zinc (total)	2	0.058	

Notes: * - Discharges exceeding these limits may be eligible for inclusion into the overstrength wastewater discharge program.

** - Detection limit greater than By-law limit due to matrix effects.