OPERATIONS & MAINTENANCE MANUAL

Smucker Fruit Processing Co.

Grandview Facility

100 Forsell Road

Grandview, WA 98930

Telephone: (509) 882-1530

Last revision: May 25, 2023

Revision History

Revision Date	Description of Changes	Reviewed by
5/25/23	Updated plant contacts; Revised for new HMI system; removed use of Magnesium Hydroxide for pH adjustment	A.Clark, A. Manibog
10/16/22	Revised for new pH adjustment system	A.Clark
5/16/22	Annual review; corrected section numbering and table of contents	A.Clark; B. Mast
5/18/21	Annual review, added revision history page; no other changes	A.Clark; B. Mast
5/21/20	Review and submission for new permit effective 06/01/2019; incorporated previous amendment documentation, more detailed system operating and monitoring procedures (section 3), as well as Solid Waste Control Plan (Appendix C) and Spill Prevention and Slug Discharge Control Plan (Appendix D)	A.Clark; B. Mast
8/10/18	Amendment for system modifications	A.Clark; B. Mast
9/28/17	Revised to include all O&M manual requirements as requested by DOE	A.Clark; B. Mast

CONTENTS

CERTIFICATION PAGE

Name of Facility:	Smucker Fruit Processing Co. Grandview, WA
Type of Facility:	Fruit juice and puree processing for jams, jellies, and juices
Date of Initial Operations:	The plant was built in 1969 and began operations in 1969.
Wastewater Discharge Permit#:	ST0009110
Location of Facility:	100 Forsell Road Grandview, WA 98930
Name of Owner:	The J.M. Smucker Company Orrville, OH
Plant Contact:	Andie Manibog, Plant Manager P: 509-882-6705
Key Personnel:	Andrea Clark, HR/HSE Manager P: 509-882-6716 Sarah Mothershead, Operations Manager P: 509-882-6721
Review:	A review of the Operations & Maintenance manual will be completed at least annually. The plan will be updated and amended within six (6) months of the review.

A review and evaluation of the Operations & Maintenance manual has been completed on 5/25/2023.

_____ _____

Andie Manibog, Plant Manager Date

1. Current State Waste Discharge Permit No. ST0009110

ST0009110-2019-04-18-Permit.pdf

2. City of Grandview Sewer Use Ordinance

City of Grandview
Sewer use Ordinance

3. Responsibilities

Responsible Official:
Andie Manibog
Title: Plant Manager
P: 509-882-6705

Responsible for daily implementation and management of plan:
Andrea Clark
Title: HR/HSE Manager
P: 509-882-6716

Sarah Mothershead
Title: Operations Manager
P: 509-882-6721

Responsibility for approving of orders for replacement parts and supplies:
Plant Manager/Operations Manager/Operations Team Leader

4. Description of plant type, design criteria and process operations

4.1 Production scheduling

The Smucker Fruit Processing plant processes various fresh or frozen fruits including grapes, cranberries, apples, and berries. The plant is operated 18 to 20 hours per day/5 days a week except during grape harvest in September and October when the plant operates 24 hours/7 days a week. Finished juice or puree concentrates are packaged in bulk containers and shipped to an off-site cold storage for freezing and shipment to other Smucker facilities.

4.2 Process description and operations

The plant liquid waste stream consists of two main components:

a) Incoming potable city water, which is used for washing fruit, product addition, cooling towers, pump seal water, process equipment operation of filters and evaporators, facility sanitation, boiler feed, and employee facilities.
b) Condensate water is produced by the fruit evaporation process. A portion of the generated condensate water can be stored on-site for use as boiler feed water and for wash down applications.

Table 1: Average volumes for liquid waste components.

Incoming City water:	Maximum 398,000 gal/d Average 110,882 gal/d
Condensate water from evaporators:	Maximum 50,000 gal/d Average 22,000 gal/d can be used as boiler feed water or wash down
Water Output:	Clean up sanitation water
Total plant wastewater flow:	Maximum 426,000 gal/d Average 195,000 gal/d

The fruit processing plant liquid waste is collected in a drain system and directed through a rotary screen and settling basins and a pH adjustment tank prior to discharge to the City's wastewater treatment facility.

The settling tanks are drained, and the settled solids are removed at a minimum of twice per year or as necessary. The waste from the settling tanks is hauled by a third-party carrier to an animal feed processor or used in land application. This waste does not contain any human sewage waste.

The wastewater pH is adjusted after the settling tanks when the pH drops below 6 or rises above 10 using either Liquid Caustic Soda (50%), or Sulfuric Acid (93%). Low pH wastewater discharge is a result of fruit residual being cleaned out of the processing equipment. High pH wastewater discharge is a result of cleaning processing equipment with caustic solution. No other treatment of wastewater is performed.

Sanitary waste from employee facilities is sent through sanitary discharge lines to the city's wastewater treatment facility.
The City of Grandview monitors the flow and industrial discharge to the city's treatment facility.

4.3 Design Criteria

Under the existing wastewater discharge permit our discharge limits are as follows:

pH – between 5.0 and 11.0 at all times			
Quarterly allocations	**Volume (in Million Gallons)**	**BOD (in pounds)**	**TSS (in pounds)**
Jan – Mar	11.360	48,600	53,700
Apr – Jun	12.740	47,320	65,480
Jul – Sep	12.880	82,800	66,280
Oct – Dec	20.0	142,650	134,900

4.4 Smucker Wastewater Treatment System Functional Description

The WWTS consists of the following components, as shown on Figure 1 – Process Flow Diagram:

1. T1 – Collection Pit (4,000 gal)
    a. LV1 – Level sensor
    b. P1A – Discharge pump
    c. P1B – Discharge pump
2. Flow meter for plant effluent – located between T1 and screen
3. Rotating Screen (screen size: 0.03")
4. T2 - Settling Tank #1 - (dimensions: 6'8" x 23' x 15', Volume: 17,213 gal)
5. T3 - Settling Tank #2 (dimensions: 16'5" x 23' x 15' , Volume: 42,374 gal)
    a. LV3 – Level sensor
    b. P3A – Discharge pump
    c. P3B – Discharge pump
6. T4 – pH adjustment tank (15,000 gal)
    a. LV4 – Level sensor
    b. Eductor array
    c. P4A – Discharge/Recirculation pump (Weinman)
    d. P4B – Discharge/Recirculation pump (Weinman)
    e. pH probe 1
    f. pH probe 2
    g. FM4 – Flowmeter
    h. V4 – Automatic discharge valve
    i. Sulfuric acid tank with peristaltic metering pump
    j. Caustic tank with peristaltic metering pump
7. Outfall to city with discharge pumps
    a. 15 HP Cornell pump (2) - Pumps are operated in lead-lag mode controlled by float switches for a maximum pumping capacity of approx. 550 gpm.
    b. Wastewater sampling station operated by the City of Grandview performs sampling, refrigeration, pH and flow recording
    c. pH probe 3 ("City")
8. Secondary read-out of pH probe values and flow in plant QC lab and Sentinel Pro Remote Monitoring System
9. HMI control system

The manuals for all equipment and critical parts are compiled in Appendix A.

The WWTS process is as follows: 1) Process water from the plant is conveyed via underground pipe into the Pit, 2) water in the Pit is buffered of pH, 3) pH-adjusted water is then pumped via surface-mounted suction/lift discharge pumps through the rotating screen to remove solids, 4) water is gravity fed through Settling Ponds 1 and 2 and into the City Sump, and 5) discharge to the City's waste water treatment plant.

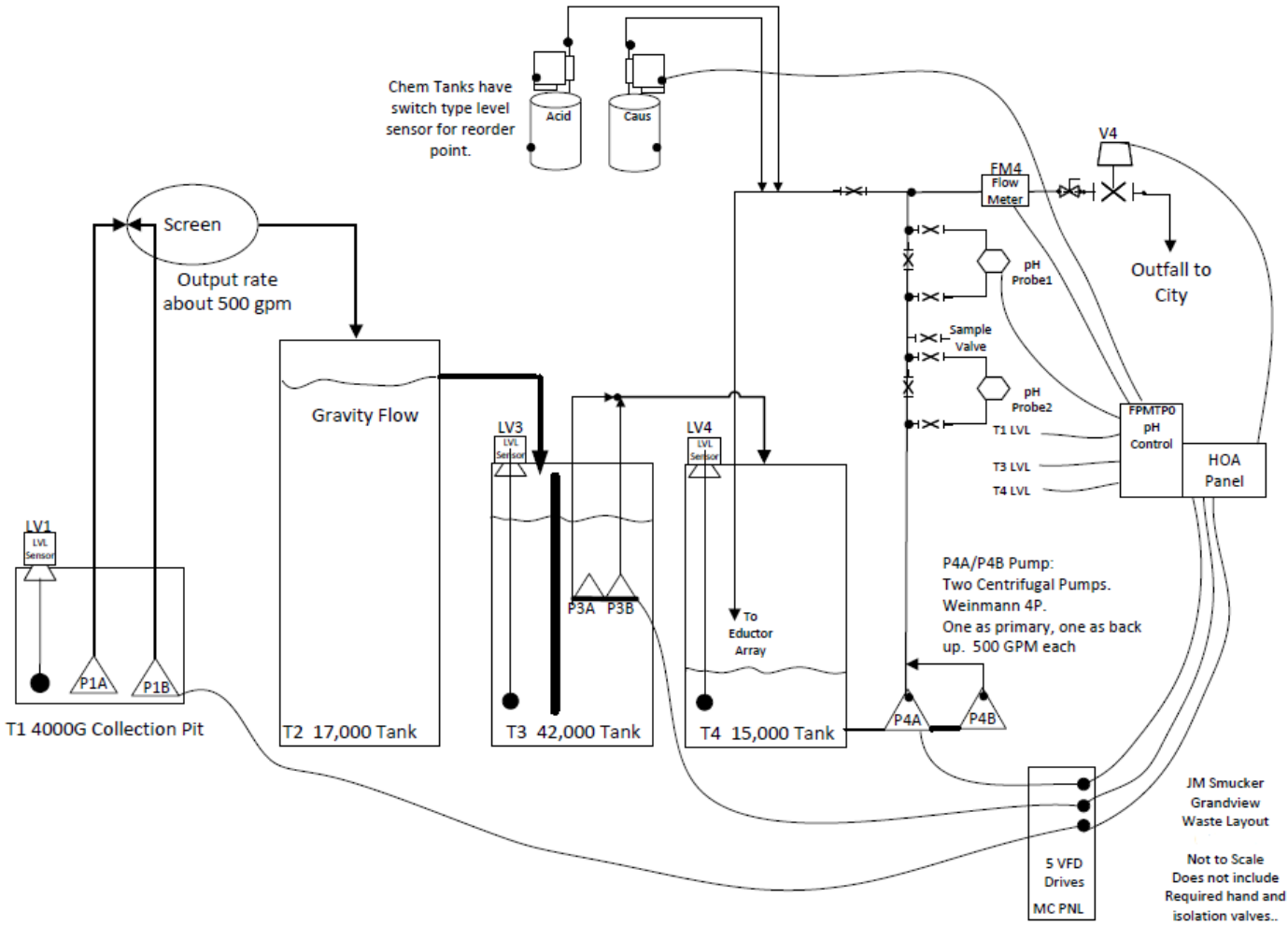


Fig. 1 – Process Flow Diagram

The wastewater treatment system process is as follows: A sub ground level collection pit (T1) will receive process water via gravity flow from the plant drains. As the pit gathers waste, the transfer pumps (P1/B will move the waste thru the solids separating screen to the first settling tank (T2).
The settling tank will gravity flow and drop into a walled section of another settling tank (T3) for further settling. T3 also acts as a partial buffer tank for plant flows in front of the neutralizing tank (T4). The discharge pumps for T1 and T3 are controlled via level sensor. The control scheme is designed to keep the tank about 30 % full with the upper 70 % being the buffer storage for incoming water. This level can be adjusted over time based on actual plant operations.
The waste neutralization tank (T4) has a recirculation pump (P4A/B), pH monitor (pH probe 1 and 2), and level monitor. The system is designed to remain at a level of about 30 % (Operator adjustable). As the level rises above 29% (adjustable), the circulation pump will start. This sends a sample past the pH probe.

The controller will feed sodium hydroxide or sulfuric acid into the tank until the pH is within the set parameters. Once the wastewater is within discharge limit, the discharge valve (V4) will open and allow discharge to the city. This operation can be activated completely manually if desired.

Sentinel Pro Monitoring System
The Sentinel Pro Monitoring System is located next to the City's flow meter storage box. The Sentinel system allows for monitoring of the pH sensor installed in the City discharge sump, which is the compliance point for the City of Grandview, as well as the City flow meter. The web-based system allows operators and supervisors to observe pH conditions remotely, receive alarm callouts of preset alarm settings, and download historical system performance data.

4.5 Control System

Wastewater is introduced into the treatment process at the collection pit. The collection pit includes Collection Pump 1, and Collection Pump 2, a level transmitter and float switch. The collection pumps run simultaneously upon request from controller. Collection pumps cycle based upon setpoints entered under "Setpoints" page, under "Collection". Wastewater will fill until top setpoint is reached, at this point the pumps are started. Pumps will run until "stop" setpoint is reached. As a backup, the collection pit utilizes a digital float switch. If level transmitter fails, pumps are controlled off float signal.

The collection pumps transfer wastewater through the rotating screen. Screen control is standalone and is given start command from controller. The screens "run" is based on cycles and duration setpoint under "Setpoints" page under "Collection". Collection pumps are tracked for complete cycles, when the setpoint matches the current cycle count than the screen is requested to run for the preset amount of time entered in the duration setpoint. After time is complete, screen will shut off until the current cycles match the setpoint again. From the screen, wastewater goes to settling pit.

The settling pit is controlled by Settling Pump 1, Settling Pump 2, and a level transmitter. Settling pumps cycle based upon setpoints entered under "Setpoints" page under "Settling". Wastewater will fill until top setpoint is reached, at this point the pump is started. Both settling pumps are not required to run at same time and are alternating. The pump alternating function is controlled by means off setpoints on "Settling" page. This is entered in Days, Hours, and minutes. Once accrued time becomes greater than the Days, Hours, and Minutes entered, the secondary pump will run. If either pump is taken out of "Auto" the system will utilize the last pump that was in "Auto" and command run.

Settling pump(s) transfer wastewater from settling pit to the treatment tank. The treatment tank is controlled by Treatment Pump 1, Treatment Pump 2, level transmitter, and City Valve. The pump(s) take the wastewater and recirculate or discharge to the city. The two effluent pumps utilize the city valve to either be in recirc (closed) or "discharge to city" (open). The pump alternating function is controlled by means off setpoints on ""Setpoints" page under "Effluent" page. This is entered in Days, Hours, and minutes. Once accrued time becomes greater than the Days, Hours, and Minutes entered, the secondary pump will run. The system requires that, at a minimum, one pump is always running. With pump(s)

running, the automatic injection of chemicals is happening based on the primary pH reading and the dosing setpoints located on the “Dosing” page. When the Primary pH reading is within the limits of the effluent setpoints and the treatment tank level is above the low level setpoint, the city valve will automatically open once level is greater than the “Valve Level Reset”. The discharge to the city is controlled only by the city valve and once treated water has passed the valve then it is transferred into the city pit where two standalone pumps control transfer treated water into public utilities drain line.

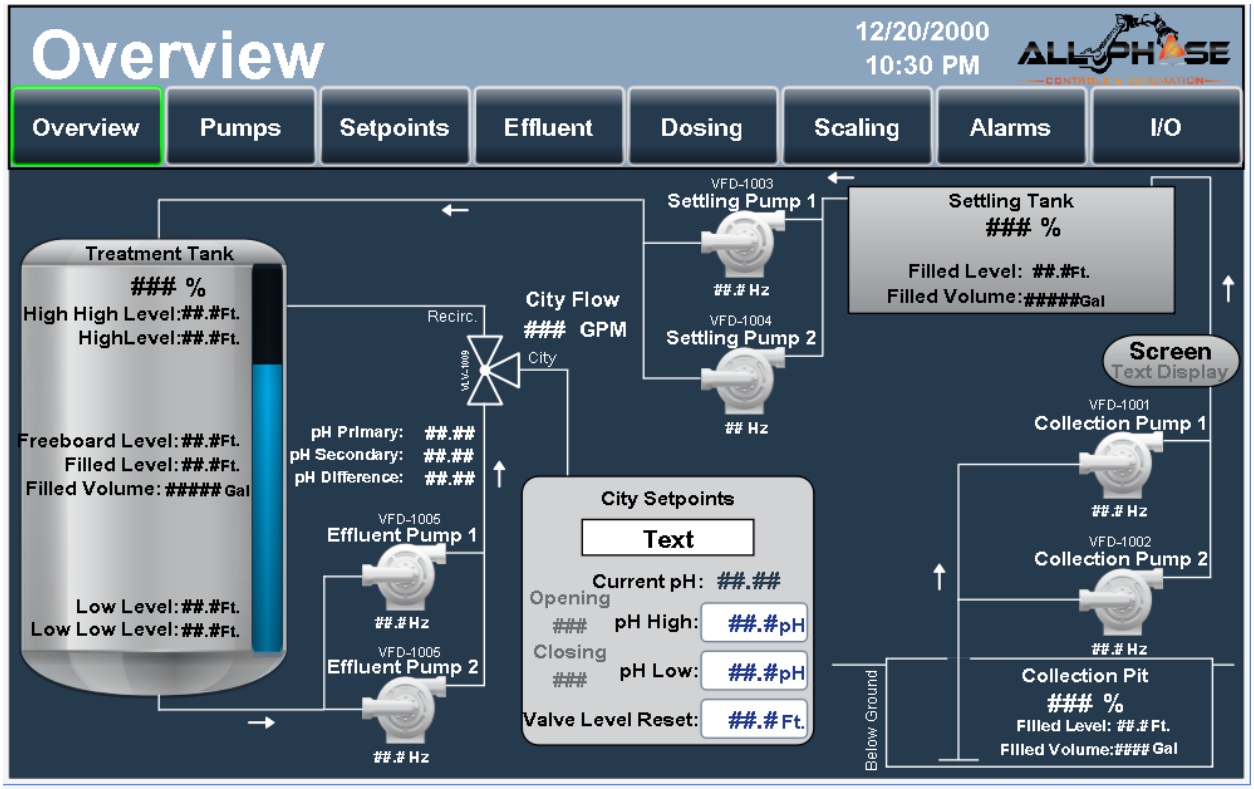
The following will close the city valve flow to prevent violation:

- Primary pH Out of Limits.
- Treatment Tank Level is below Low setpoint.
- Treatment tank Level is below Low-low setpoint.
- Neither effluent pump is running.
- Chemical pump 1007 has failed to stop.
- Chemical pump 1008 has failed to stop.

When city valve is ready to open, open delay timer is initialized. When complete, if conditions are still within limits, valve will “open”. Valve Closing works in the same manner. A close delay timer will initiate, if conditions are met, the timer will initiate before the command to close is sent.
Dosing is setup to control two different chemical pumps that are injecting chemicals into the discharge of the effluent pumps mixing as flow travels to treatment tank. The two chemical pumps work on the opposite scales of the neutral reading of the primary pH. The Acid will inject if the primary pH value exceeds 7pH and will increase injection rate as the pH reading increases. The Caustic will inject if the primary pH value decreases below 7pH and will increase injection rate as the pH reading decreases to 0. The rate of injection is controlled by the operator entered setpoints located on the “Dosing” page.

To help with a faster reaction of mixing an air mixer solenoid was added and controlled from the setpoints located on the second page of the “Pumps” page. The air mix solenoid is requested anytime either of the chemical pumps rate is higher than the setpoint entered by operator. It is also requested when the pH is out of limits and if the treatment tank level is above the setpoint entered by operator.

Overview-Home Page



The overview page provides a broad overview of the entire waste-water system. The overview covers the 3 main storage areas, starting with the Collection Pit, Settling Tank, and Treatment Tank that eventually outflows to the city collection pit through an automated valve. The overview will only have adjustability of three Setpoints located in center of page under “City Setpoints” text entry box will have font in blue. Any other color of font is a display only text box. “pH High” sets the value at which the city valve will close. The “pH Low” will set the secondary closing limit. If the pH Primary probe value is within the limits, then the city valve will have the ability to open after certain permissive are met. The third setpoint labeled “Valve Level Reset” is compared to the level of the treatment tank and allows the valve to re-open out to the city pit for discharge if valve is commanded to close under an automated lockout.

Overview top banner for navigation section that allows access to the other 7 pages. The following pages will cover:

1. **Pumps** Selection buttons and control over Hand-Off-Auto, Variable Frequency Drive (VFD), external devices status/control objects
2. **Setpoints** Numerical entry for automatic permissive for collection, settling, and effluent control
3. **Effluent** Effluent valve setpoints, City pH dilution setpoints, and valve Closing permissive status
4. **Dosing** Selection buttons and control over Hand-Off-Auto, and Chemical pumps status/control objects
5. **Scaling** Field instrument Calibration and setup for measured values in the system
6. **Alarms** Alerts for process complications, failed field devices, and programmed safeties
7. **IO** Digital status of both input and output modules

Pumps Page

All Variable Frequency Drives-Pump control panels contain the following objects:

Status

Stopped- Drive has detected motor has stopped rotation.

Running- Drive has detected motor rotation present.

Faulted- Drive has reported an internal fault over communication.

Speed Reference

Speed being referenced or commanded from controller over ethernet communications to drive.

Speed Feedback

Speed value reported from drive to controller over ethernet communications.

Power Output

Power value in Kilowatts reported from drive to controller over ethernet communications.

Power Current

Current value in Amperage reported from drive to controller over ethernet communications.

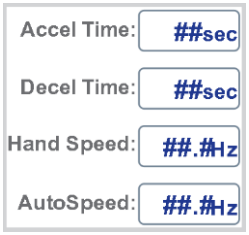
Runtime Hours

Time accrued when drive has reported its running status over ethernet communications.

Start Counter

Cycles accrued when drive has been commanded to start over ethernet communications.

Pumps-Adjustable Setpoints



Adjustable Numeric entry setpoints will be displayed in blue text font and allow the following values to be changed:

Accel Time

Numeric entry box to adjust parameter in drive that controls the acceleration rate at which it achieves the referenced setpoint in seconds

Decel Time

Numeric entry box to adjust parameter in the drive that controls the Deceleration rate at which it achieves a stopped state, starting from the referenced setpoint in seconds.

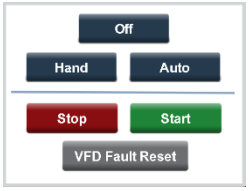
Hand Speed

Numeric entry box to adjust the speed commanded from controller when in hand operation of the drive in hertz.

Auto Speed

Numeric entry box to adjust the speed commanded from controller when in automatic operation of the drive in hertz.

Pumps-H-O-A



Pushbutton selection panel changes the state in which the controller handles the control of the drive:

Off

Pushbutton selection when in “Off” prohibits startup of equipment and places drive in a neutral state.

Hand

Pushbutton selection when in “Hand” places drive in ready to start with no automatic control where operator is responsible for controlling pump through start/stop buttons and Hand speed reference.

Auto

Pushbutton selection when in “Auto” Places drive in automatic control allowing controller to perform start/stop control and speed adjustment of the drive when logic requires it.

Stop

Pushbutton selection to command drive to stop function. Use with “Hand” selection primarily because if system is in auto then it will automatically restart up if logic requires a running condition

Start

Pushbutton selection to command drive to start function. Use with “Hand” selection primarily because if system is in auto then it will automatically re-engage stop if logic requires a stopped condition

VFD Fault Reset

Pushbutton selection to command drive to reset present fault and place drive in ready to start state. Pushbutton is only functional if drive is actively faulted.

Pumps- Screen Motor Starter/Sprayer

Screen control is done by hardwired relay logic wired to motor starter and water solenoid valve located on Page 1 of Pumps section. Our panel sends a signal to start both devices through remote relay contacts. In automatic, the screen is commanded to start based on setpoints page on certain cycles and for a duration entered by operator.

Off

Pushbutton selection when in “Off” prohibits startup of equipment and places both devices in a neutral state.

Hand

Pushbutton selection when in “Hand” places equipment in ready to start with no automatic control where operator is responsible for starting and stopping screen.

Auto

Pushbutton selection when in “Auto” places equipment in automatic control allowing controller to perform start/stop of screen when logic requires it

Status

Text Display showing status screen output. “Called” is when logic is requesting the screen to run, and “Not Called” is when logic is not requiring screen to run.

Stop

Pushbutton selection to command screen to stop function. Use with “Hand” selection primarily because if system is in auto, then it will automatically restart if logic requires a running condition.

Start

Pushbutton selection to command screen to start function. Use with “Hand” selection primarily because if the system is in auto, then it will automatically re-engage stop if the logic requires a stopped condition.

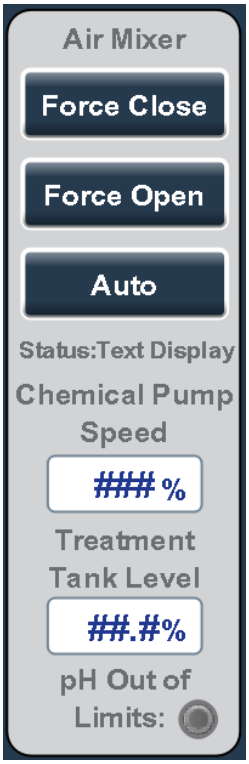
Cycles Current

Text display showing the current accrued cycle count for the collection’s pumps running signal.

Runtime Countdown

Numerical display showing a countdown when the runtime timer is timing till screen is requested to stop.

Pumps-Air Mixer



Air mixer solenoid is located on page 2 of Pumps section and controls the solenoid for treatment tank mixing. When in auto, two conditions will cause the air mixer to run. One is if the chemical pump speed goes above the "Chemical Pump Speed" setpoint, and other is if both the treatment tank level is above the "Treatment Tank Level" setpoint and the pH is out of the limits located on the homepage.

Force Close

Pushbutton selection when in "Force Close" prohibits the solenoid to energize place valve in a neutral state.

Force Open

Pushbutton selection when in "Force Open" places solenoid in ready to start with no automatic control, operator is responsible for opening and closing the solenoid.

Auto

Pushbutton selection when in "Auto" places solenoid in automatic control allowing controller to perform start/stop of valve when logic requires it.

Status

Text Display showing status solenoid output. "Called" is when logic is requesting the solenoid to open, and "Not Called" is when logic is requesting solenoid to close.

Stop

Pushbutton selection to command solenoid to stop function. Use with "Hand" selection primarily because if system is in auto then it will automatically restart up if logic requires a called condition

Start

Pushbutton selection to command solenoid to start function. Use with “Hand” selection primarily because if system is in auto, then it will automatically re-engage stop if logic requires a Not Called condition.

Chemical Speed Pump

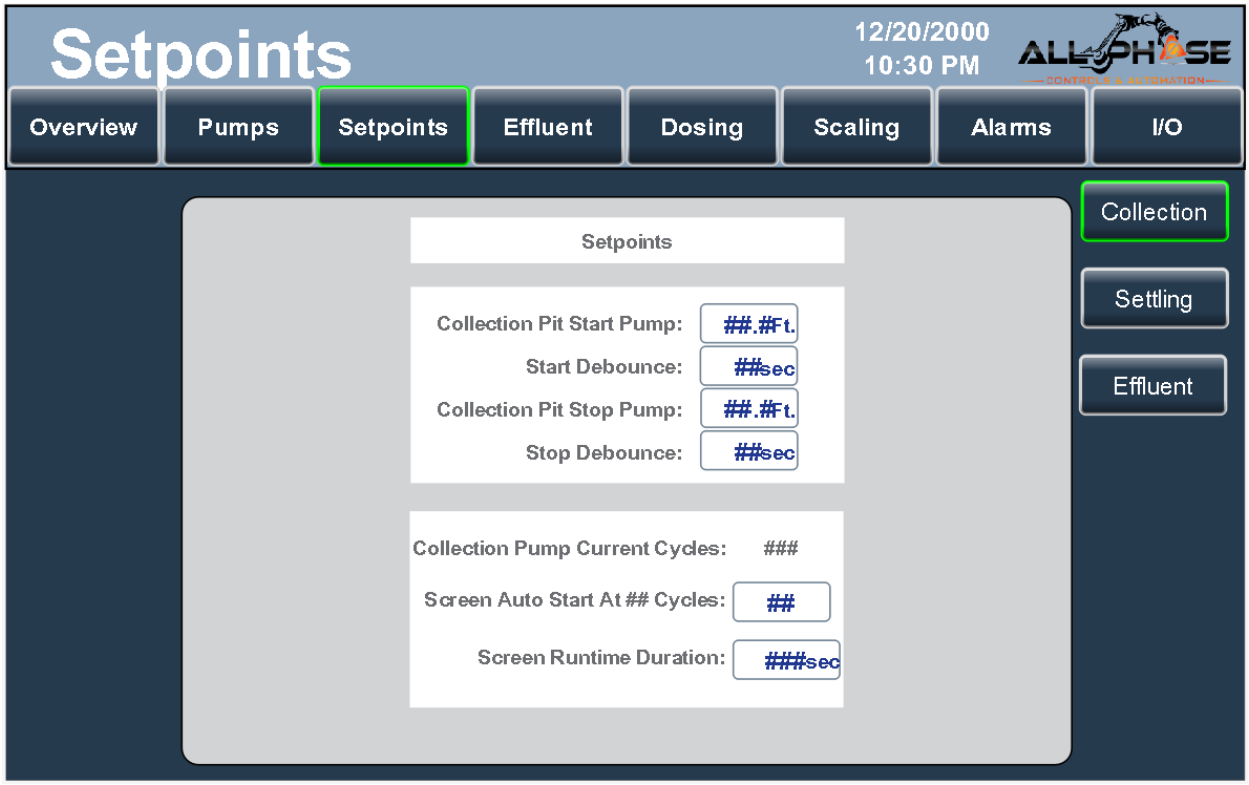
Numeric entry box to adjust percentage in which the chemical pumps have to be running at for the air solenoid to be called to mix if in Auto.

Treatment Tank Level + pH Out of Limits

Numeric entry box to adjust percentage in which the treatment tank level has to be at on top of the pH being out of the limits located on the home page. If in Auto and both conditions are met, then the air mixer solenoid is called to start.

Setpoints Page

Setpoints- Collection



Setpoint page consist of values adjustable by operator to set the level at which equipment will start and stop pertaining to the 3 sections Collection, Settling, and Effluent.

Collection Pit Start Pump

Top start level in which the collection pit must reach before pumping down to the stop setpoint.

Start Debounce

Once Collection pit level has reached the start pump level setpoint it must be above the setpoint for time duration entered. Time entry in seconds.

Collection Pit Stop Pump

Bottom stop level which the collection pit must reach before stopping pump

Stop Debounce

When collection pit level has reached the stop pump level setpoint it must be below the setpoint for the time duration entered in this box. Time entry in seconds

Collection Pump Current Cycles

Text display showing the current accrued cycle count for the collection's pumps running signal.

Screen Auto Start at ## Cycles

Numerical entry box adjusting the setpoint at which the screen will run at. When this setpoint equals the "Collection Pump Current Cycles" then the screen will be requested to run if it is in Auto.

Screen Runtime Duration

Numerical entry box adjusting the duration of the runtime the Screen will be allowed to run. Time entry in seconds.

Setpoint- Settling

Settling Tank Start Pump

Top start level in which the settling tank must reach before pumping down to the stop setpoint.

Start Debounce

Once settling level has reached the start pump level setpoint it must be above the setpoint for time duration entered. Time entry in seconds

Settling Tank Stop Pump

Bottom stop level in which the settling level must reach before stopping pump.

Stop Debounce

When settling level has reached the stop pump level setpoint it must be below the setpoint for the time duration entered in this box. Time entry in seconds

VFD-1003 Settling Pump 1 Backspin Delay

For pump protection a backspin delay is added so that during the timing of the delay, it should not allow either pump to run so that drive does not command a forward start during the time the process variable is causing pump to spin reverse.

VFD-1003 Settling Pump 1 Backspin Countdown

During the timing of the backspin timer, this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the pump will be available to start.

VFD-1004 Settling Pump 2 Backspin Delay

For pump protection a backspin delay is added so that during the timing of the delay it should not allow either pump to run so that drive does not command a forward start during the time the process variable is causing pump to spin reverse.

VFD-1004 Settling Pump 2 Backspin Countdown

During the timing of the backspin timer this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the pump will be available to start.

VFD-1003 Settling Pump 1 Auto Runtime Allowed

Numerical entry for Days, Hours, and Minutes that is to be the maximum amount of time until alternation occurs and automatically rotates to next pump.

VFD-1003 Settling Pump 1 Auto Runtime Accrued

Numerical display for time accrued for Days, Hours, and Minutes. When time accrued equals or is greater than the runtime allowed then it will automatically rotate to next pump.

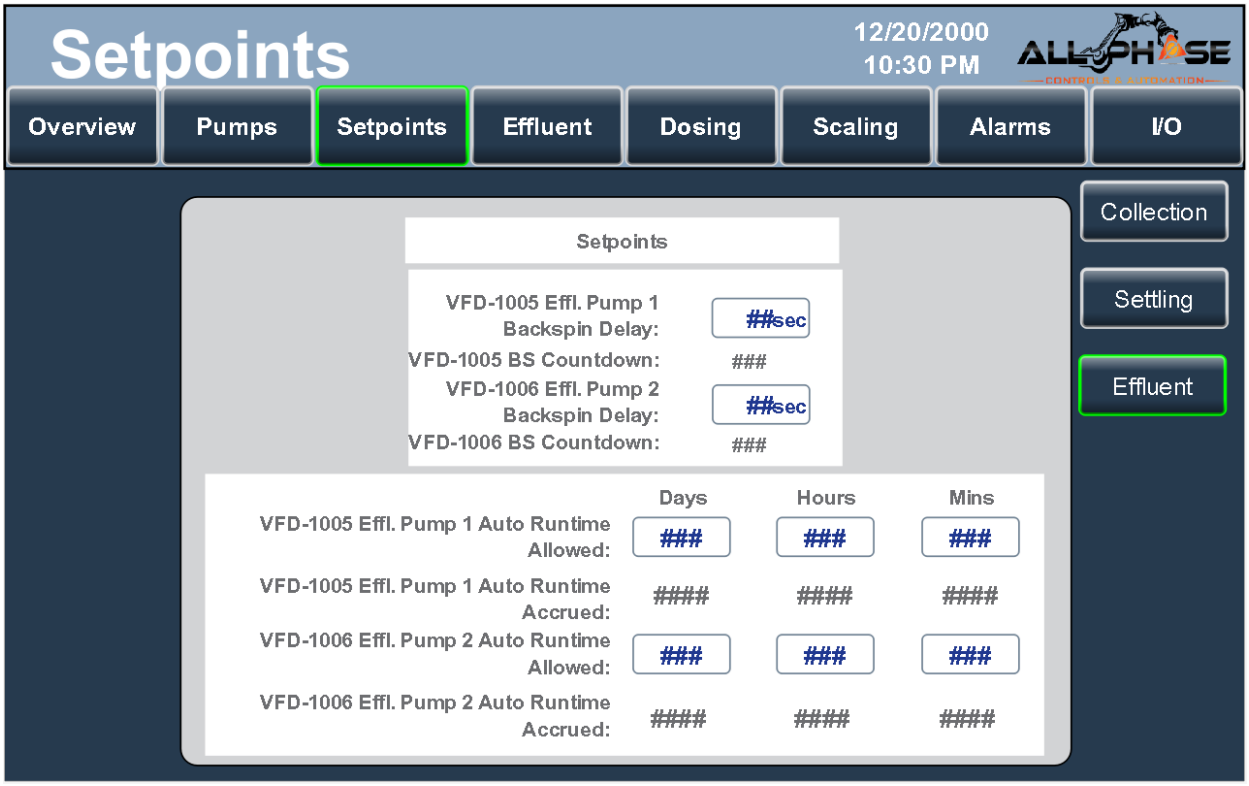
VFD-1004 Settling Pump 2 Auto Runtime Allowed

Numerical entry for Days, Hours, and Minutes that is to be the maximum amount of time until alternation occurs and automatically rotates to next pump.

VFD-1004 Settling Pump 2 Auto Runtime Accrued

Numerical display for time accrued for Days, Hours, and Minutes. When time accrued equals or is greater than the runtime allowed then it will automatically rotate to next pump.

Setpoints- Effluent



VFD-1005 Effluent Pump 1 Backspin Delay

For pump protection a backspin delay is added so that during the timing of the delay, it should not allow either pump to run so that drive does not command a forward start during the time the process variable is causing pump to spin reverse.

VFD-1005 Effluent Pump 1 Backspin Countdown

During the timing of the backspin timer this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the pump will be available to start

VFD-1006 Effluent Pump 2 Backspin Delay

For pump protection a backspin delay is added so that during the timing of the delay, it should not allow either pump to run so that drive does not command a forward start during the time the process variable is causing pump to spin reverse.

VFD-1006 Effluent Pump 2 Backspin Countdown

During the timing of the backspin timer this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the pump will be available to start

VFD-1005 Effluent Pump 1 Auto Runtime Allowed

Numerical entry for Days, Hours, and Minutes that is to be the maximum amount of time until alternation occurs and automatically rotates to next pump.

VFD-1005 Effluent Pump 1 Auto Runtime Accrued

Numerical display for time accrued for Days, Hours, and Minutes. When time accrued equals or is greater than the runtime allowed then it will automatically rotate to next pump.

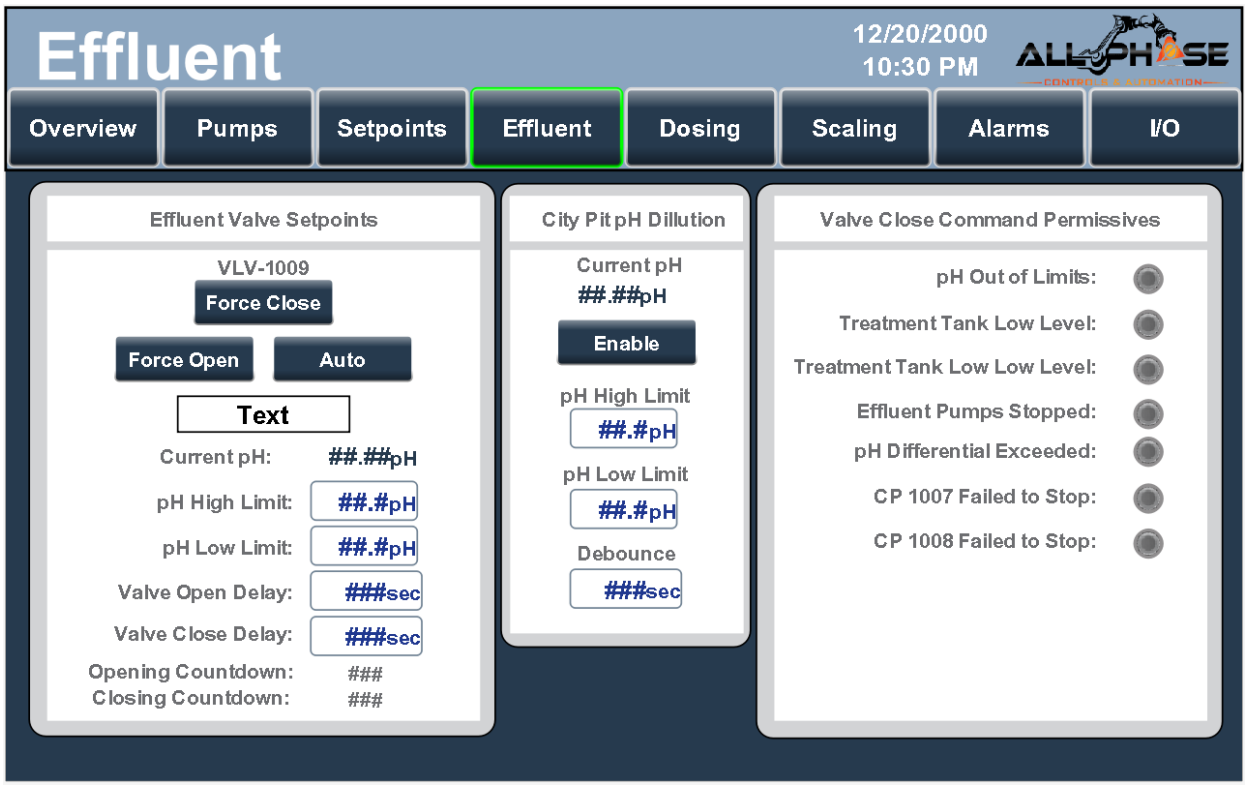
VFD-1006 Effluent Pump 2 Auto Runtime Allowed

Numerical entry for Days, Hours, and Minutes that is to be the maximum amount of time until alternation occurs and automatically rotates to next pump.

VFD-1006 Effluent Pump 2 Auto Runtime Accrued

Numerical display for time accrued for Days, Hours, and Minutes. When time accrued equals or is greater than the runtime allowed then it will automatically rotate to next pump.

Effluent Page



Effluent page covers the city valve setpoints, city pit pH dilution logic setpoints, and status of close command per missives.

Effluent Valve

Force Close

Pushbutton selection when in “Force Close” energizes the close contactor commanding only to close.

Force Open

Pushbutton selection when in “Force Open” energizes the open contactor commanding only to open.

Auto

Pushbutton selection when in "Auto" places solenoid in automatic control allowing controller to perform start/stop of valve when the logic requires it.

Status

Text Display showing status of valve showing 4 different states:

Closed-	Recirc.-Feedback from close contacts on city valve have been made.
Closing…-	Command to close valve but have not received close contact feedback.
Open-City.-	Feedback from open contacts on city valve have been made.
Opening…-	Command to open valve but have not received open contact feedback.

Current pH

Numerical Display showing status of primary pH probe value.

pH High Limit

Numerical entry identical to the entry available in the overview page, that adjust the top end limit where if the current pH rises above the high limit setpoint it will command to close the valve.

pH Low Limit

Numerical entry identical to the entry available in the overview page, that adjust the bottom end limit where if the current pH rises below the low limit setpoint tit will command to close the valve.

Valve Open Delay

Numerical entry for the time required for open condition to dwell until it commands the valve to open.

Valve Close Delay

Numerical entry for the time required for close condition to dwell until it commands the valve to close.

Opening Countdown

During the timing of the Open Delay timer this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the open command is sent to the valve.

Closing Countdown

During the timing of the Close Delay timer this countdown inverses the time accumulated and will display a countdown until it reaches zero at which point the close command is sent to the valve.

City Pit pH Dilution

Current City pH

Numerical Display showing status of primary pH probe value.

Enable

Pushbutton selection that enables the control for city dilution logic that will look at both treatment tank pH and city probe pH. If City pH is out of limits and unable to be

discharge to city, then it will look at the treatment pH and fill the pit with the water that is within its limits so that the city pH value adjusts to the tank pH.

City pH High Limit

Numerical entry that adjust the top end limit where if City pH value rises above the "City pH High Limit" setpoint it will automatically feed water from treatment tank to allow pH to neutralize between the limits.

City pH Low Limit

Numerical entry that adjust the bottom end limit where if City pH value falls below the "City pH low Limit" setpoint it will automatically feed water from treatment tank to allow pH to neutralize between the limits.

City pH Debounce

Once the City pH value has reached either limit this setpoint will be the duration in which it will dwell until treatment tank is allowed to be fed into to neutralize between limits. Time entry in seconds

Valve Close Command Permissive

Status object that displays in red when valve has active command to close valve. If no red lights are on and valve is closed than most likely the system is waiting to build up enough water to rise above the "Valve Level Reset" setpoint, at which it will open and discharge to city pit. The following is an explanation on why its setup to close valve:

pH Out of Limits

Screen object display changes to red when the Primary pH probe value is measuring outside the High and Low limits

Treatment Tank Low Level

Screen object display changes to red when the Treatment tank level has drained below the low level setpoint. Avoiding injecting chemical where it floats and goes straight into city pit.

Treatment Tank Low Low Level

Screen object display changes to red when the Treatment tank level has drained below the low low level setpoint. Avoiding injecting chemical where it floats and goes straight into city pit.

Effluent Pumps Stopped

Screen object display changes to red anytime the effluent pumps are not longer providing a running signal feedback. As these pumps are either used to discharge or recirculate depending on the city valve state.

pH Differential Exceeded

Screen object display changes to red when the pH Differential Exceeded alarm is triggered. Informing that the secondary and primary pH values have drifted apart and measuring greater than the pH Differential Exceed setpoint for the present amount of time.

CP 1007 Failed to Stop

Screen object display changes to red when chemical pump (Sodium Hydroxide) has failed to stop injecting chemicals after being commanded to stop by controller.

CP 1008 Failed to Stop

Screen object display changes to red when chemical pump (Sulfuric Acid) has failed to stop injecting chemicals after being commanded to stop by controller.

Dosing Page

Status

Stopped- Controller has received stop signal from chemical pump.

Running- Controller has received running signal from chemical pump.

Faulted- Controller has commanded chemical pump to run but not run signal was not received.

Speed Cmd

Speed being referenced or commanded from controller over analog control to chemical pump.

Rate

Speed value calculated based on the 20mA Max rate that should match physical pump max output rating

Runtime Hours

Time accrued when chemical pumps have reported a running status over wired signal

Start Counter

Cycles accrued when chemical pump is commanded to start over wire signal

Off

Pushbutton selection when in “Off” prohibits startup of chemical pump

Hand

Pushbutton selection when in “Hand” places chemical pump in ready to start with no automatic control where operator is responsible for controlling pump through start/stop buttons and Hand speed reference.

Auto

Pushbutton selection when in “Auto” places chemical pump in automatic control allowing controller to perform start/stop and speed of pump when logic requires it

Stop

Pushbutton selection to command chemical pump to stop function. Use with “Hand” selection primarily because if system is in auto, then they will automatically restart up if logic requires a running condition

Start

Pushbutton selection to command chemical pump to start function. Use with “Hand” selection primarily because if system is in auto, then it will automatically re-engage stop if logic requires a stopped condition

Hand Speed

Numeric entry box to adjust the speed commanded from controller when in hand operation of the chemical pump in percentage

20mA Max Rate

Numeric entry box to match rate to output of controller. Chemical pump has a 20mA max rate programmed pertaining to size of tubing and operator preference. If max rate is ever changed on chemical pump it will have to be matched in by entering changed rate into this setpoint box.

Rate Min

Numeric entry box to set the pH value at which the pumps will pump at a rate of zero.

Rate Max

Numeric entry box to set the pH value at which the pumps will pump at its max rate.

Scaling Page

Scaling page is used for maintenance personnel to be able to modify the field instruments range without needing to connect/online with controller. If new instrument has a larger or smaller range the only setpoint that would need to be changed would fall under the “Scaled Max” column.
Raw Min and Raw Max are set to the controllers input module settings. Scaled min is usually zero unless the signal is measuring below zero or has an elevated zero. Password will unlock all adjustable registers.

Alarms Page

All alarms are setup the same with only a couple of them having a setpoint to be compared to in logic. Some alarms will have control tied to it where if the alarm becomes active than it will influence the control to prevent a violation. Each alarm has the following:

Enable

Will allow the ability to turn off alarm in case that we need to bypass certain permissive to get back to an operational standpoint. Is also used to disable alarms in case field device is under maintenance.

Setpoint

For alarms that are being compared to analog values, the setpoint entry allow the adjustability to accommodate for different process variables.

Delay

After the condition that triggers the alarm becomes active there is a delay that is adjustable by operator to limit false alarm conditions.

Status

Ok-No alarm exist and running under normal conditions.

Alarm- Alarm has been activated after the delay was complete, informing operator of possible issue with the wastewater process.

Alarm Reset

Pushbutton that resets the alarm state and will clear current alarm present. If alarm resumes after reset has been used that further troubleshooting will be required to shut off alarm and place system back into normal running conditions.

Alarm List

Alarm 2000 Collection Pit High Level
PT-1103 level transmitter value is greater than the setpoint.

Alarm 2001 Collection Pit Low Level
PT-1103 level transmitter value is less than the setpoint.

Alarm 2002 Settling Tank High Level
PT-1104 level transmitter value is greater than the setpoint.

Alarm 2003 Settling Tank Low Level
PT-1104 level transmitter value is greater than the setpoint.

Alarm 2004 Treatment Tank Level High High
PT-1105 level transmitter value is greater than the setpoint.

Alarm 2005 Treatment Tank Level High
PT-1105 level transmitter value is greater than the setpoint.

Alarm 2006 Treatment Tank Level Low
PT-1105 level transmitter value is less than the setpoint.

Alarm 2007 Treatment Tank Level Low Low
PT-1105 level transmitter value is less than the setpoint.

Alarm 2008 Effluent valve Fail to Open
VLV-1009 valve failed to provide open feedback.

Alarm 2009 Effluent valve Fail to Close
VLV-1009 valve failed to provide closed feedback.

Alarm 2010 Effluent Valve Closed w/GPM Present
VLV-1009 valve provided a closed feedback signal, but flow is present and greater than setpoint.

Alarm 2011 Not Used

Alarm 2012 Primary pH High
pH-1100 pH transmitter value is greater than the setpoint.

Alarm 2013 Primary pH Low
pH-1100 pH transmitter value is less than the setpoint.

Alarm 2014 Redundant pH High
pH-1101 pH transmitter value is greater than the setpoint.

Alarm 2015 Redundant pH Low
pH-1101 pH transmitter value is less than the setpoint.

Alarm 2016 City pH High
pH-1102 pH transmitter value is greater than the setpoint.

Alarm 2017 City pH Low
pH-1102 pH transmitter value is less than the setpoint.

Alarm 2018 pH Differential Exceeded
pH-1100 and pH-1101 have signal deviations greater than the setpoint.

Alarm 2019 Not Used

Alarm 2020 Collection Pump 1 VFD Faulted
VFD-1001 faulted signal present from drive received over comms.

Alarm 2021 Collection Pump 2 VFD Faulted
VFD-1002 faulted signal present from drive received over comms.

Alarm 2022 Settling Pump 1 VFD Faulted
VFD-1003 faulted signal present from drive received over comms.

Alarm 2023 Settling Pump 2 VFD Faulted
VFD-1004 faulted signal present from drive received over comms.

Alarm 2024 Effluent Pump 1 VFD Faulted
VFD-1005 faulted signal present from drive received over comms.

Alarm 2025 Effluent Pump 2 VFD Faulted
VFD-1006 faulted signal present from drive received over comms.

Alarm 2026 CP 1007 Caustic Failed to Start
CP-1007 was sent a command to start signal but did not return a running signal.

Alarm 2027 CP 1008 Acid Failed to Start
CP-1008 was sent a command to start signal but did not return a running signal.

Alarm 2028 CP 1007 Caustic Failed to Stop
CP-1007 was sent a command to stop signal but did not return a stopped signal.,

Alarm 2029 CP 1008 Acid Failed to Stop
CP-1008 was sent a command to stop signal but did not return a stopped signal.

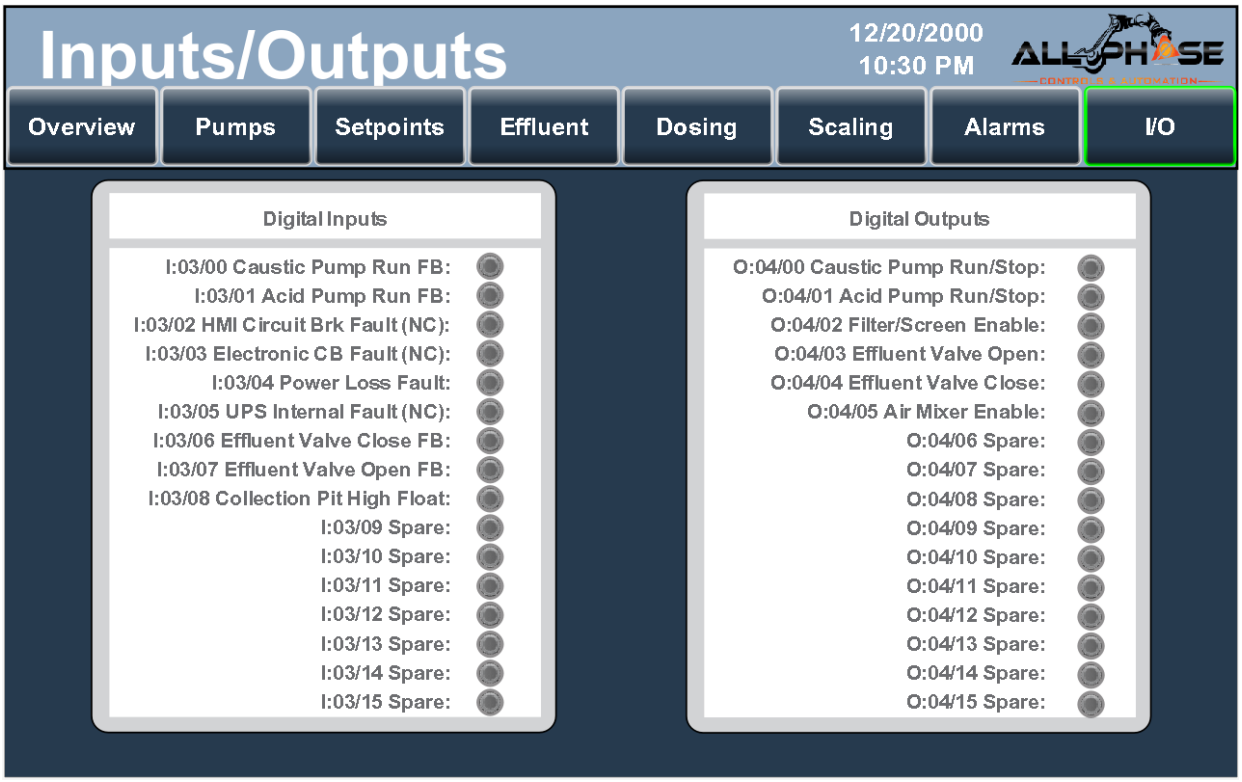
Alarm 2030 Not Used

Alarm 2031 Primary pH Transmitter Out of Range
pH-1100 pH transmitter signal has over-ranged past 20mA or under-ranged below 4mA.

Alarm 2032 Redundant pH Transmitter Out of Range
pH-1101 pH transmitter signal has over-ranged past 20mA or under-ranged below 4mA.

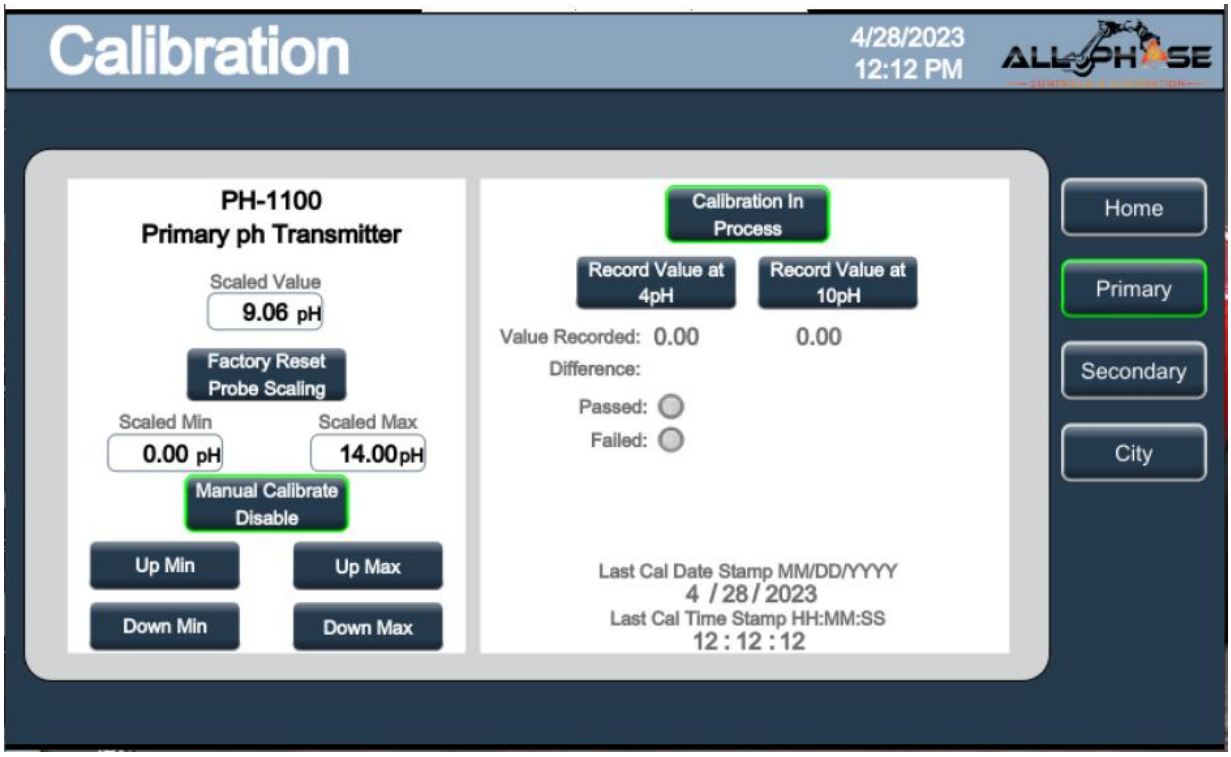
Alarm 2033 City pH Transmitter Out of Range
pH-1102 pH transmitter signal has over-ranged past 20mA or under-ranged below 4mA.

IO Page



Input/Output page is used for maintenance and support only. This page shows the signals actively present at the module level and have no screen development logic tied to it.

Calibration Page



Scaled Value

Numerical Display showing status of primary pH probe value after applying scaling logic.

Factory Reset Probe Scaling

Pushbutton to reset values on transmitter back to factory where 4mA = 0pH and 20mA=14pH.If Calibration is not in Process than this button can be used to reset to values back to default.

Scaled Min

Numerical Display showing status of primary pH probe value for the minimum pH measured by instrument.

Scaled Max

Numerical Display showing status of primary pH probe value for the maximum pH measure by instrument.

Manual Calibrate Enable

Toggle pushbutton to initiate the manual procedure to adjust zero and span values of signal. When enabled the pushbutton border will be highlighted green and will display 4 buttons that adjust the scaled min(zero) and scaled max(span). When enabled and if any of the 4 buttons are pressed than a time stamp will be updated to indicate a change to the calibration that was performed manually.

Up Min

Momentary Pushbutton that adjusts the Scaled Min by .01 upwards every time the button is pressed.

Down Min

Momentary Pushbutton that adjust the Scaled Min by .01 downwards every time the button is pressed.

Up Max

Momentary Pushbutton that adjust the Scaled Max by .01 upwards every time the button is pressed.

Down Max

Momentary Pushbutton that adjust the Scaled Min by .01 downwards every time the button is pressed.

Calibrate Primary Probe

Toggle pushbutton to initiate the procedure to verify instrument measured values and compare to the standard solution pH of 4pH and 10pH. When enabled the border of the button will be highlighted in green and the text will change to “Calibration in Process”. Calibration remains enabled if values measured are not within tolerance and require recalibration by writing new values. If a “Passed” signal is shown in green than a pop-up displaying “Probe Within Tolerance” displays for 10 seconds and will automatically disable the Calibration after date/time stamping that record.

Record Value at 4pH

Pushbutton that momentarily snapshots value taken during calibration procedure. This sets the value to be compared for verification and calculates possible new offset to zero if values are written to set new scaling.

Record Value at 10pH

Pushbutton that momentarily snapshots value taken during calibration procedure. This sets the value to be compared for verification and calculates possible new offset to span if values are written to set new scaling.

Value Recorded

Numerical display showing status of recorded value taken during calibration procedure. This value is used to calculate the offset to the zero or span required to be with in tolerance if writing new values is required.

Difference

Numerical display showing status of recorded value taken during calibration procedure. This value is used to calculate the offset to the zero or span required to be with in tolerance if writing new values is required.

Passed

Screen object will highlight green if a passed signal is received when verifying pH values to standard solution. If a passed signal is received than a Date/Time stamp is recorded and the calibration procedure will be finished and disabled automatically in 10 seconds.

Failed

Screen object will highlight red if a Failed signal is received when verifying pH values to standard solution. If Failed than the recorded values are used to calculate a new offset to zero and span and will only change when confirmed by operator by pressing the “Write New Values” pushbutton.

Write New Values

Pop up pushbutton to set new values to the actual scaling block of the meter. Once written a pop up text display will show “Sending over New Scaling Values” for about 5 seconds and automatically disable the calibration.

Cancel

Pop up pushbutton to cancel and reset all the registers that the calibration procedure took in case a solution error happened and would like to start the calibration from the start.

Last Cal Date Stamp MM/DD/YYYY

Text display to show the date of last verification of measured values that passed or if new values are written to set a new offset and max.

Last Cal Time Stamp HH:MM:SS

Text display to show the time of last verification of measured values that passed or if new values are written to set a new offset and max.

5. Operating and Monitoring Procedures

JMS must meet the pH discharge limit of 5.0 to 11.0 as record by the city pH meter.

5.1 Daily Start-up and Shutdown Procedure

Responsibilities: Quality Control
A daily verification check will be performed to check system status and documented on the Wastewater Probe Verification Log:

a) Check the pH levels in the top and bottom ponds
b) Check samples from T4 against probe 1 and probe 2 readings (see section 5.2)
c) Check spent caustic tank level
d) Check city pH meter readings
e) Perform weekly check of sediment levels in T2 and T3

High or low pH levels at the city discharge will trigger the Sensaphone alarm system and the lab will receive a phone call from Sensaphone. Enter the acknowledgement code **555** when prompted. Investigate the cause of the pH outage and start corrective action immediately.

5.2 Routine pH probe verification

The system uses two probes in the same stream. If the probes indicate more than a 0.3 to 0.5 difference from one another, then one of them likely needs to be cleaned.

Pull a sample of the water from the test port. Note the pH value on the controller at the time the sample is pulled. Check the pH of the sample with a calibrated handheld pH meter. If the handheld pH meter is more than 0.3 off from pH Primary or pH Secondary readings, then perform a pH probe calibration using specified buffers. If the difference is still present, then replace the probe to a clean or new probe.

5.3 Calibration Procedure

Primary Probe Notes: Place City Effluent Valve in the “Force Close” position, Place both chemical pumps in the “Off” position.
Secondary Probe Notes: Alarm 2018 pH Differential needs to be “Disabled”
City Probe Notes: N/A

1. Isolate wastewater flow from transmitter insertion point. Open drain once inflow and outflow valves are isolated to relieve any pressure in the line. Unmount pH transmitter.

2. Clean pH probe meter with de-ionized water. Low or anti-static wipes should be used to avoid any changes in the mV signal.
3. Provide current Buffer solution of 4pH and 10pH at least 100mL of each in case multiple tries are necessary or if contamination occurs. Temperature of solution and location temp should match accordingly to the values specified in the solution and be close to process variable temperature to keep calibration variables consistent with each other. *Make sure that the sample you're measuring is around 77 degrees Fahrenheit to obtain an accurate reading.*
4. Once pH transmitter sensing area is clean and rinsed with de-ionized water then the tip of instrument can be submerged in a buffer solution of 4pH solution, and the "Calibrate Primary Probe" pushbutton can be pressed. Once solution reading has settled out 60sec-120sec the pushbutton "Record Value at 4pH" can be pressed to record the value.
5. Rinse probe with de-ionized water then the tip of instrument can be submerged in a buffer solution of 10pH solution. Once solution reading has settled out 60-120sec then the pushbutton "Record Value at 10pH" can be pressed to record the value.
6. At this point the calibration verification process determines if the instrument "Passed" or "Failed". If passed, the Calibration procedure will auto terminate and record a date/time stamp at the same time it will display a confirmation text on the screen reading "Probe within Tolerance".

   If failed, then the calibration procedure will continue and display two hidden pushbuttons, one is to "Write New Values" and second is to "Cancel" which ends calibration procedure with no new values being written to affect calibration. When "Write New Values" is pressed the values that were recorded when taking the sample reading are compared to the standard reading of 4pH and 10pH and calculates a new min and max scaled values for the pH transmitter scaling.
7. If new values written are not correct or mistakenly written to scaling block than the "Factory Reset Probe Scaling" pushbutton can be pressed and will reset those values back to the original values of 0pH for Min and 14pH for Max.
8. A Manual Calibration procedure can be used if the values are not automatically calculated correctly. To perform this procedure only the pushbuttons under the Manual Calibration toggle button are used to adjust the min and max values and are visible if the "Calibrate Primary Probe" and "Manual Calibrate Enable" are both enabled and highlighted green. Calibration adjustments will increase or decrease by 0.01 for small gradual changes in scaled readings.
   A. Use buffer solution 4pH and when stable adjust the Min up or Min Down until the scaled value matches the 4.00 pH standard.
   B. Rinse with de-ionized water
   C. Use buffer solution 10pH and when stable adjust the Max up or Max down until the scaled value matches the 10.00pH standard.
   D. Go back and forth until both readings in 4pH and 10pH are withing calibration tolerances. This will also send a date/time stamp to the calibration side for recording through SCADA.

5.4 Used Caustic Tank Release Procedure

The spend caustic tank will automatically empty on a timer. It should be turned on Monday mornings, and off after draining Friday. If the tank is not emptying enough each day to keep up with the added caustic, please notify the QA Manager.

5.5 Alarm Responses

Tank LOW

Activates when the water level in the respective Tank drops below the LOW ALARM set point (10 %).

Most likely cause is the pump control is in HAND.

For T4, the Discharge valve could be stuck open.

1. Check flow meter for flow indication.
2. Verify the OFF-AUTO switch is in the AUTO position.
3. Close Hand Valve on discharge pipe. Confirm flow stops.
4. Manually monitor tank level and open this valve to allow discharge until repair is made.

Tank 1 or 3 HIGH

Activates when the water level in T1 or T3 rises above the Set Point (Currently 75%). Indicates water is coming into the tank faster than it is being discharged.

Possible Causes:

1. Next tank in succession has a High Alarm.
    a. Check down stream tanks for proper function.
2. Transfer Pump not operating.
    a. Check Valves and Switches are set properly.
    b. Confirm pump/s is not jammed or plugged and is operating.

    If T3 has the alarm, it may be necessary to stop flow from T1 until problem is resolved. This will stop T3 from overflowing.

For **T4**

Possible Causes:

1. Out of Caustic or Acid Chemical. Chemical Pump lost prime or is turned off.
2. Probe for pH is giving incorrect reading.
3. Drain Valve won't Open or is clogged (Check OFF-AUTO is in AUTO).
4. Circulation Pump (P4A or P4B) not operating. (Check Valves and Switches are set).
5. Waste strength is stronger than time allowed to neutralize and discharge. (Needs more time to pump chemical).

If T4 has the alarm, it will automatically stop flow from T3 to T4

5.6 Chemical Pump Priming

In manual for A3V24 Flex Pro Metering Pump, see section 3.0 HOW TO OPERATE.

With the pump in OFF, press and release the Double Arrow key for priming. The pump will run for 60 seconds at 100% speed. If pump is primed before 60 seconds has passed, press the STOP key.

6. Laboratory procedures

Laboratory testing provides the information needed for process control. Test results provide a record of treatment system efficiency and are helpful in predicting problems that may develop and to take appropriate corrective action.

Composite sampling of the waste stream is conducted twice per week and samples are analyzed for BOD and TSS by the city at their accredited laboratory (Lab ID: W445). Grab samples are used for pH samples and a continuous recording of pH discharging to the city is used.

The pH probe is calibrated daily on weekdays by the City of Grandview and records are kept by the city. All BOD, TSS and pH test results are provided to Smucker and submitted to the Department of Ecology for review to determine if the plant is in compliance with its wastewater discharge permit limits.

7. Recordkeeping procedures

Records are maintained for a minimum of three (3) years. Records include continuous monitoring records, calibration and maintenance records, and reports as required by our Washington State Waste Discharge Permit# ST0009110, section S3.C.

8. Maintenance schedule

Wastewater **sumps** are cleaned at least once per year.

Sediment levels n the settling ponds should be checked periodically using the “sludge judge”. Notify QA Manager when sediment is within 2 feet of the surface.

The **settling tanks** will be dried as much as possible, and the remaining sludge will be dug out and hauled away. The basins are cleaned at least twice a year or sooner if sediment levels require.

Pumps: Annual maintenance, oil changes, belt inspections. Completed maintenance tasks on equipment is recorded on Smucker maintenance log forms.

Wastewater sampling station: Maintained by the City of Grandview on a weekly basis.

Siemens Flow Meter: Calibration is completed annually by a third-party contractor. City staff is on site during the calibration to assist if needed.

8.1 Level Sensor

T1, T3 and T4 each has a pressure based pressure sensor. The transmitter can be removed, inspected and cleaned once every 6 months to a year. If tank level indications become erratic at any time, inspect the level sensor for debris or moisture. Each level senor has a Desiccant Kit that keeps moisture from reaching the back of the sensor. The Desiccant Kit is located in the J-Box where the sensor cable terminates. The desiccant should be inspected every six months for color change. If the purple color turns pink, the desiccant has become saturated with moisture and should be replaced. Order replacement refill kit: 7A14475

8.2 Flow Rate Sensor (FM4)

The flow rate sensor is an insertion mag meter that is located just upstream of the discharge control valve. It may require cleaning on occasion.
TO REMOVE METER FOR CLEANING:

1. Place circulation pump control to OFF.
2. Close the valves in the discharge pipe to isolate the water from the tank.
3. Open V1 (motorized valve) by turning hand crank enough to relieve system pressure and drain some excess fluid away from meter.
4. Press down slightly on top of meter and pull the U pin at the top of the TEE.
5. Pull meter up and clean as required.
6. Reverse order to reinstall. Note FLOW direction arrow on meter.
7. Return all valves and switches to original positions.

8.3 Chemical Pump Tube

The chemical pump is equipped with a Pump Tube Timer. This can be set to trigger the Maintenance Alarm for Scheduled Maintenance action.

There is an option to ‘reverse flow’ on the chemical tube allowing about twice the tube life.

Directions for changing the tube and resetting the maintenance timer can be found in the directions in the manual A3V24 Flex Pro Metering Pump in section 6.0.

8.4 pH Probes

The pH probe is a sensor that has a glass film that is submersed into the water. The glass is loaded with micro pores that allow the electrode to sense the water that is exchanging thru the pores. The sensor generates a micro voltage based on the pH it sees in the pores. Because the probe must generate a voltage, it has a service life. A normal probe life is six months to a year. As the probe uses its service life the voltage produced will reduce, this will cause the controller to indicate a different pH than what the system water really is. Once it goes past an acceptable difference the controller can be calibrated to correct the differential. Follow the calibration procedure in the controller manual to adjust the reading to the probe. Once the probe requires an adjustment of more than 25% for calibration, the controller will not accept the calibration settings. In this case the probe must be replaced.

The glass surface of the probe must be kept wet. If it dries out, the pores will close and the probe will no longer function properly. In some cases the probe can be re-hydrated and continue its service life, however may require frequent recalibration.

Fouled Probe. Incorrect pH reading can also be caused by the probe getting fouled. This is essentially the pores getting plugged so the normal exchange of water cannot occur. If the waste stream has fats, oils or sticky debris, then the probe is susceptible to fouling. This will cause the sensor to misread the pH value of the water. While often the common solution is to perform a calibration and adjust the controller to match the probe's output, the best solution is to clean or exchange the probe. Many plants must rotate probes between a cleaning solution and the system on a regular basis. This routine will maximize probe life and keep the reporting accurate.

Stray Voltage. An additional condition that will cause improper readings is stray voltage in the water. There are times that pieces of equipment associated with the waste system may "leak" voltage into the water. Since the probe is using the voltage it generates to provide a value to the controller, the excess voltage it sees in the water can cause the pH reading to jump up or down as the equipment turns on and off. This condition makes it seem like the probe must always be recalibrated.

Verification. On a weekly basis, or more if required, a test of the pH of the water with a known-accurate hand held pH tester should be run and compared to the pH reading on the controller. If the difference between the two readings is considered unacceptable, then the probe should be swapped with a clean probe. If a clean probe will not properly indicate then a calibration of the controller to the probe should be performed.

9. Safety

Plant safety program consists of monthly safety committee meetings which include all aspects of plant operations as well as wastewater disposal. Safety programs used in wastewater include Lockout/Tagout, Personal Protective Equipment, Hazard Communication Program for Chemicals, and Confined Space Entry. Spill prevention and safe work practices are reviewed on a regular basis with plant personnel. Chemical receiving procedures are in place to assure safety and prevention of spills. Safety program training is reviewed annually with employees, new hires and all contractors coming on site.

Chemical	SDS
Liquid Caustic 50%	Liquid-Caustic-Soda-50-SDS.pdf
Sulfuric Acid 93%	Sulfuric-Acid-93-98.pdf

10. Emergency plans and procedures

The Smucker Fruit Processing Co. plant has an Emergency Procedures Manual in place.
The Emergency Plan addresses Incident Command responsibilities in case of fire, hazardous material releases, natural disasters, and power outage.
The Spill and Slug Discharge Control Plan in Appendix D must be followed to prevent and control any material releases that could impact POTW.
Main impact to the wastewater system would be a power failure. During a power failure, the system will not allow water to be pumped off site. All systems are controlled by electricity and will not be operational. If power is out for more than 60 minutes, the City of Grandview will be contacted as a result of meter back up limitations.
During a system failure, the plant can be shut down until the problem is corrected.

Table 2: Emergency contacts

Plant Manager	Andie Manibog	Office: 509-882-6705 Cell: 509-205-9210
HR/HS&E Manager	Andrea Clark	Office: 509-882-6716 Cell: 509-205-4021
Operations Manager	Sarah Mothershead	Office: 509-882-6721 Cell: 253-486-9082
Operational Team Leader/Maintenance	Doug Penwell	Office: 509-882-6715 Cell: 509-830-0935

11. Service, Equipment and Supply Vendor list

Vendor / Contact	Address	Phone	Products
Pump Tech Inc.	209 S. Hamilton Rd, Moses Lake, WA 98837	509-766-6330	Pumps and motors
Lyco Manufacturing, Inc.	115 Commercial Drive, Columbus, WI 53925	920-623-4152	Single drum screen
Furrow Pump	8525 SW St. Helens Drive, Wilsonville, OR 97070	503-682-4411	LMI controller, Chemical metering pumps, pH probes
Northstar Chemicals – John Strait	14200 SW Tualatin Sherwood Rd, Sherwood, OR 97140,	503-625-3770	Chemical tanks, Liquid caustic, sulfuric acid
Alba's Excavating – John Alba	1440 Forsell Road, Grandview, WA 98930	509-882-2047	Maintenance of settling basins
All-Phase Controls – Agustin Prado	2500 S. 12th Ave., Union Gap, WA 98903	509-454-5093 Cell: 509-949-7784	HMI Control, programming, VFDs
Stegeman Electric – Chuck Stegeman	125 W 2nd Street, Grandview, WA 98930	509-882-3800	Electrical contractor
Field Instruments & Controls, Inc. – Cameron Bachman, Craig Cheney	9629 N. Colfax Road, Spokane, WA 99218	509-466-8226	Calibration and service of flow meters and other instrumentation
Sensaphone	901 Tryens Rd Aston, PA 19014	877-373-2700	Sentinel Pro SN 00:07:F9:00:91:1A
Harrington Industrial Plastics, LLC	4480 Yorba Ave Chino, CA 91710	909-597-8641	Valves; chemical metering parts
Automation Direct	www.automationdirect.com	1-800-699-0405	Electrical supplies, Loop Isolator
IDEC Corporation	1175 Elko Drive, Sunnyvale, CA 94089 www.us.idec.com	1-800-262-4332	MOV Timer Relay, Timer Relay base

APPENDIX A – MAINTENANCE MANUALS

Unit	**Cornell pumps – 15 HP/350 gpm, 20 HP/550 gpm**
Process Description	T1 and T3 discharge pumps; city sump discharge pumps
Maintenance	Annual preventive maintenance includes Oil changes, belt inspections. Monthly oil level checks
Spare Parts	See Cornell pump manual. Rotating head assembly/impeller heads are kept on site as spare parts
Manual	 Cornell DS_4STX.pdf  Cornell STX O&M Manual #2871.pdf

Unit	**DeltaSpan L32 Level Transmitter**
Process Description	Level control for T1, T3, T4
Maintenance	Inspect every 6 months
Spare Parts	Desiccant replacement refill kit: 7A14475
Manual	 Level transmitter DeltaSpan LD31_LD3

Unit	**Siemens Sitrans F M Mag 5000/6000 Flow Meter**
Process Description	Flow meter measures the flow prior to the Lyco single drum screen and it is recorded on the Grandview city system. JMS employees read the meters daily during scheduled production days and record the readings in the utility documentation system.
Maintenance	Maintained by the City of Grandview. Annual calibration performed by vendor
Spare Parts	See Siemens Manual
Manual	 SITRANS F M MAG5000-manual.pdf

Unit	**Single Drum Screen 48” x 72”, 0.03” pore size**
Process Description	Rotary Drum Screen
Maintenance	Annual maintenance and regular cleaning. Waste hopper checked and emptied as needed.
Spare Parts	3153234 Trunnion Wheel assembly Motor gear box
Manual	 Lyco Single Drum Screen Manual.pdf  Single drum screen drawing.pdf  Single Drum Screen Trunnion Wheel Assy

Unit	**Weinman centrifugal pumps**
Process Description	T4 recirculation and discharge pumps
Maintenance	Annual preventive maintenance
Spare Parts	See manual
Manual	Weinman pump SGPC Manual.pdf

Unit	**Flex-Pro peristaltic metering pump**
Process Description	Caustic and Sulfuric acid chemical metering pumps at T4
Maintenance	Inspect weekly for signs of leaking, cracking or corrosion: tube replacement every 6 months or as needed
Spare Parts	See manual
Manual	Flex-Pro peristaltic metering pump.pdf

Unit	**Sensorex 8000 Series or Sensorex 660 Series pH probe**
Process Description	pH adjustment, City discharge pH monitor
Maintenance	Keep probe in solution when not using. When probe is removed, make arrangements for it to remain in solution. Calibrate the probe after anytime out of the system or when a new one is installed using pH buffers 4.0 and 10.0
Spare Parts	pH probes are replaced every 6 months or as needed
Manual	Sensorex S8000 pH Product Instructions.p Sensorex S660.pdf SpecsS600Inline2.pdf

Unit	**Sensaphone**
Process Description	pH and flow monitoring and alarm system
Maintenance	Sentinel Pro SN 00:07:F9:00:91:1A - Annual subscription renewal
Spare Parts	N/A
Manual	sentinel_pro Installation and setup

Unit	**Promation P2/3 HV-090180 Automatic Discharge Valve**
Process Description	V4 – valve to city outfall
Maintenance	Periodic inspection

Spare Parts	N/A
Manual	 Promation P23_HVN4-090180_I(

Unit	**Seametrics EX800 Electromagnetic Flow Sensor**
Process Description	FM4 flowmeter at T4 discharge
Maintenance	Periodic inspection and electrode cleaning
Spare Parts	See manual
Manual	 LT-65200203r3.8-20 220502-EX800-Instr.p

Unit	**Motor Operated Valve**
Process Description	Used caustic tank discharge valve
Maintenance	See manual
Spare Parts	MOV Timer Relay part# GT3W-A33AF20N Timer Relay Base part# SRP-06
Manual	 IDEC Timer GT3W_Instruction_She  OMButterfly_valve_Type57.pdf  OMSeries92Type-57.pdf

APPENDIX B – Circuit Breaker Manual Extracts

3.3 Connection and operating elements

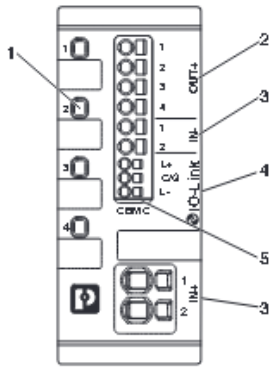


Figure 3-3 CBMC E4 ... IOL operating elements

1. Channel LED button
2. Protected outputs
3. 24 V DC supply
4. IO-Link interface
5. IO-Link LED

3.3.1 Channel LED button

The channel LED button of the CBMC E4 ... IOL is a multi-functional button. The channel state can be completely influenced with it.

Table 3-1 Channel LED button

Function	Description
On / Off	Actuate the button briefly (<2 seconds) to switch the channel on and off.
Programming mode	– The respective channel of the programming mode is activated by actuating the channel LED button for a longer time (>2 seconds). This is signaled by a channel LED flashing yellow. – Now the currently set nominal current can be read out via the flashing sequence displayed on the LED. – Furthermore, it is possible to enter a new nominal current by briefly actuating the LED button repeatedly For example, 4x actuation for 4 amps. – Afterwards, the desired nominal current can be controlled via the LED flashing sequence. – By actuating for a longer time (> 2 seconds) the new nominal current for the channel is taken on.

- After 60 seconds without activity the programming mode automatically switches off. Possible changes are discarded and the channel takes on its previous state again.
- The programming of channels can also be done while in operation. The channels do not need to be switched off.
- Initial programming:
  After the channel has been switched on, it may occur that the channel shuts off and the LED blinks red. Check the currents that have been set.

3.3.2 Diagnostics and status indicators

Designation	State	Color	Description
Channel LED button	On	Green	Channel is switched on and ready.
		Yellow	The flowing channel current is >80% of the set nominal current.
		Red	The channel has triggered due to overload or short circuit, and is in the 5-second cooldown phase. In the case of constant illumination for more than 5 seconds, there is a defect in the power path of the CBMC E4 ... IOL. The device has to be replaced in the event of such an error pattern.
	1-4 on	Red	The initial voltage is outside the prescribed range of 18 ... 30 V DC.
	Flashing	Yellow	Channel is in manual programming mode. The currently set/entered nominal current is output by the flashing.
		Red	Cooling phase after short circuit or overload release ended. Restart possible.
	Off	---	Channel switched off
IO-Link LED	Flashing	Green	IO-Link communication exists (preoperate/operate)
	Off	---	There is no connection to the IO-Link master.

The IO-Link LED under the terminal lock of the device is used for visual communication confirmation. The LED flashes in the case of an active IO-Link connection with data exchange between master and device. If you do not get any visual feedback via the LED, check the IO-Link connection and the IO-Link master configuration.

APPENDIX C – SOLID WASTE CONTROL PLAN

Smucker Solid Waste Control Plan 2020.pdf

APPENDIX D – SPILL SLUG DISCHARGE CONTROL PLAN

Smucker Spill Prevention and Slug