2022 Karl G Voelkel Award

Empire Packing

Mason, OH

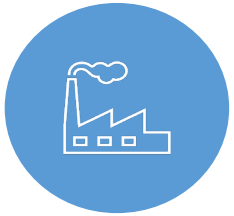
Who We Are And What We Do

Empire Management Team

Kris Berry –
Plant Manager

Trey Pruitt –
VP, Engineering

Joe Homan -
Director of
Maintenance



Dave Carpenter –
VP, Production

Dan Kirk –
VP, HR and Safety
Compliance

Mason Facility Mission Statement

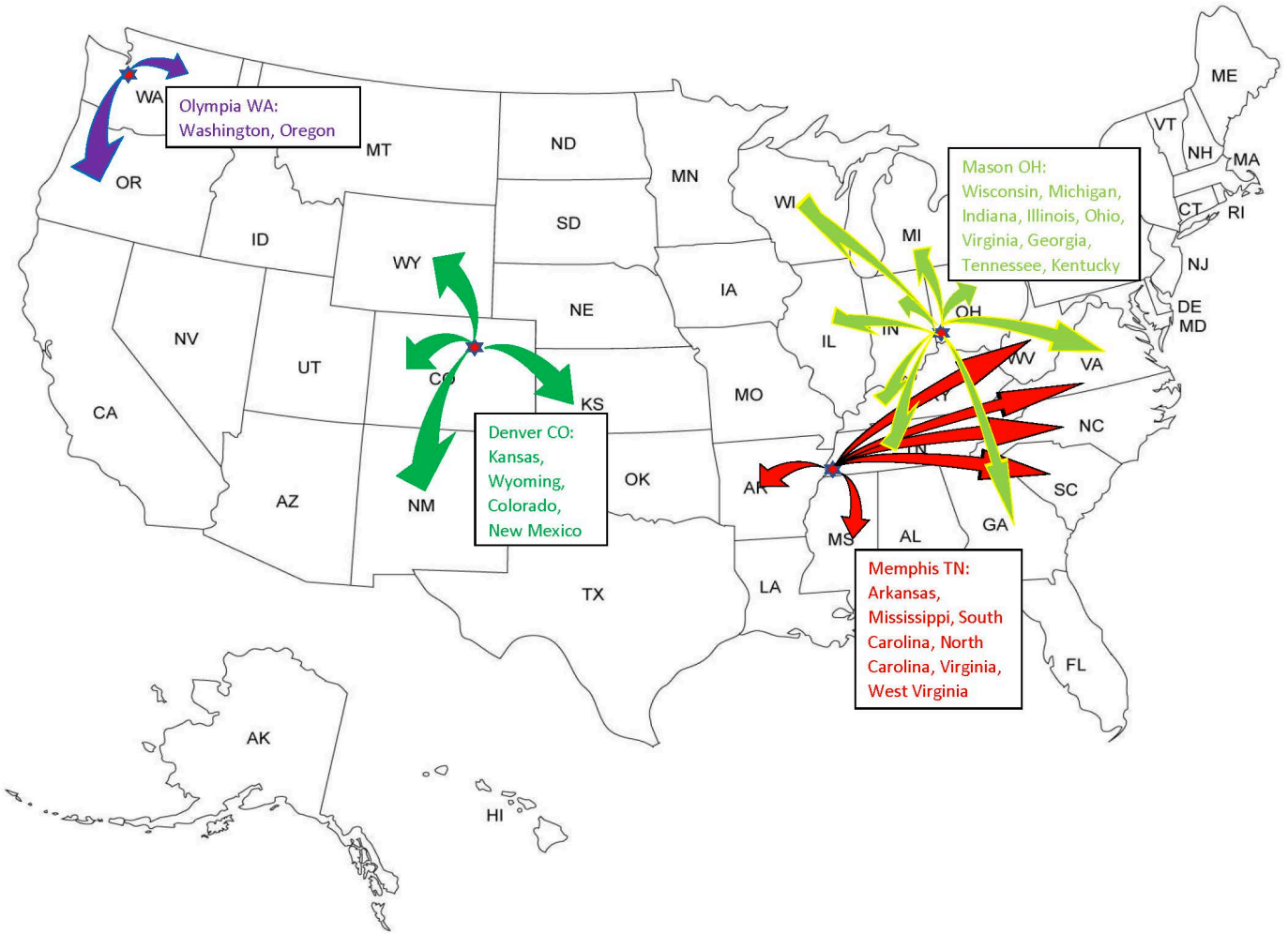
The mission of the Mason facility is to deliver customer-centric solutions by providing case ready products that exceed quality and cost expectations.

Plant Summary Statistics

- Total Number of Employees: 552 hrly. 48 salary
- Number of Mechanics: 20 Production, 8 Facilities
- Number of QC's/QA's: 16
- Total Square feet of Facility: 236,000 SQFT
- Age of Facility: Built in 2018, 3 years old.
- Average Weekly Consumption: 3,579,369 lbs./week
- Plant Capacity: 4,691,698 lbs./week (5 days, 2 Shifts)
- Packaging Formats Utilized: Low Ox/Overwrap
- Proteins Produced: Pork, Grinds, Beef
- Number of Shifts Producing: Pork- 1, Beef/Grinds 2
- Number of SKU's: 81
- Number of Divisions Serviced: 11
- Divisions Serviced: Columbus, Cincinnati, Louisville/Nashville, Michigan, Roanoke, Memphis, Food 4 Less, Jay C/Ruler, Central, Roundy's, Atlanta
- States Serviced: 9, Ohio, Kentucky, Tennessee, Michigan, Georgia, Indiana, Virginia, Wisconsin, Illinois.
- Number of Stores Serviced: 800.
- Union Representation/Local(s): None

Mason Facility Profile

Address		4780 Alliance Drive, Mason, OH 45040
Land		30.8 Acres
Footprint:		236,000 SQFT
	Production	95,000 SQFT
	Warehouse	90,000 SQFT
	Office	15,000 SQFT
	Common	36,000 SQFT
Refrigeration		Ammonia Chilled Glycol System
Capacity:		
	Pork Production Lines & Pounds per Hour	8 Lines; 35,100 Total / 26,600 Operational
	Beef Production Pounds per Hour	7 Lines; 31,800 Total / 21,200 Operational
	Grinds Production Pounds per Hour	5 Lines; 40,320 Total / 26,880 Operational
	Warehouse Raw Material	30,000 SQFT – 1056 Pallet Positions
	Warehouse Finished Goods	53,000 SQFT – 2280 Pallet Positions
	Parking Area	200,000 SQFT – 600 Vehicle Positions
Number of Employees		600


Olympia WA:
Washington, Oregon
Denver CO:
Kansas,
Wyoming,
Colorado,
New Mexico
Mason OH:
Wisconsin, Michigan,
Indiana, Illinois, Ohio,
Virginia, Georgia,
Tennessee, Kentucky
Memphis TN:
Arkansas,
Mississippi, South
Carolina, North
Carolina, Virginia,
West Virginia
WA
OR
CA
ID
NV
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WY
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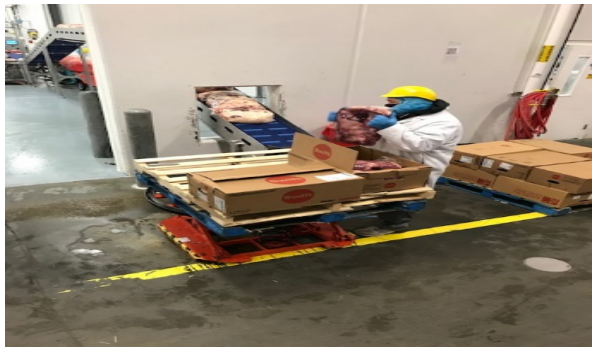
RI
NJ
DE
MD
AK
HI

Beef Summary:

- Beef Department Number of Employees: 114
- Average Weekly Consumption: 564,055 lbs.
- Beef Capacity: 1,124,639 lbs. (5 Days, 2 Shifts)
- Number of Shifts Producing: 1 Shift
- Packaging Format Utilized: Low Ox/Overwrap
- Number of Beef SKU's: 37

Beef Process:

1. Opening Product:



2. Cutting Product:

3. Trimming Product:

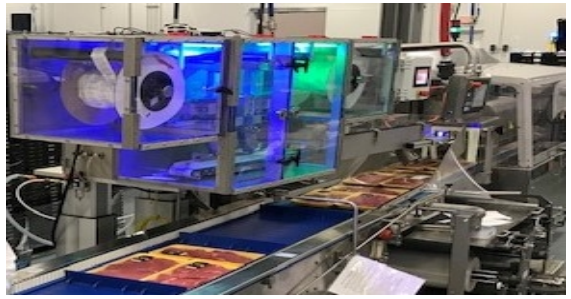
4. Traying and Styling of Product:

Beef Process Continued:

5. Wrapping of Product:

6. Ink Jet and Labeling:

7. Scavenger/Gas Flush of Product:



8. Haug Testing of Product:

9. Pack into Totes:

8. Tote Weighing and Labeling:

Pork Summary:

- Pork Department Number of Employees: 139
- Average Weekly Consumption: 714,620 lbs.
- Pork Capacity: 1,483,099 lbs. (5 Days, 2 Shifts)
- Number of Shifts Producing: 1 Shift
- Packaging Format Utilized: Low Ox/Overwrap
- Number of Pork SKU's: 22

Pork Process

1. Opening Product:

2. Trimming to Specification:

3. Bone-In Cutting Product –Ross Slicers:

4. Traying Product:

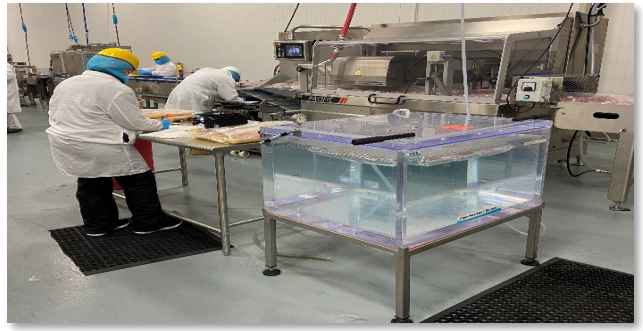
Pork Process Continued:

5. Wrapping Product:

6. Ink Jet and Labeling:

7. Gas Flush of Product:

8. Haug Testing of Product:



9. Tote Weighing and Labeling of Product:

10. Stack Off of Product:

Ground Beef Summary:

- Grinds Department Number of Employees: 122
- Average Weekly Consumption: 1,535,049 lbs.
- Grinds Capacity: 2,083,960 lbs. (5 Days, 2 Shifts)
- Number of Shifts Producing: 2 Shifts
- Packaging Format Utilized: Low Ox/Overwrap
- Grinds Capacity: 2,083,960 lbs.
- Number of Grinds SKU's: 22

Ground Beef Process:

1. Opening Product:

2. Stripping Chubs:

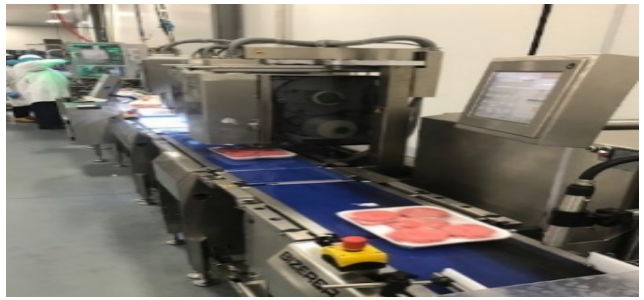
3. Portioning to Specification:

4. Traying of Product:

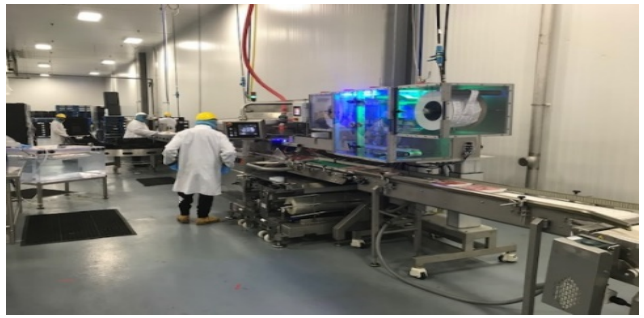
Ground Beef Process Continued:

5. Wrapping of Product:

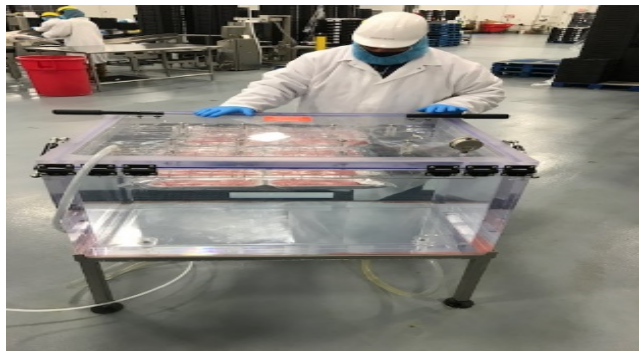
6. Ink Jet and Labeling of Product:



7. Scavenger/Gas Flush of Product:



8. Haug Testing of Product:



9. Tote Weighing and Labeling:

10. Pack Off into Totes:

MEET THE TEAM

Empire Engineering/Facilities Team

Mike Otter – Facilities/Engineering Manager

Over 30 years experience in industrial maintenance, including Schwans, Foxtail Foods, and now Empire

John Wagers – Over 20 years experience in industrial maintenance, most of which spent at Pierre/Tyson Foods. Has been with Empire for almost 4 years now.

Brandon Gray – 13 years experience in industrial maintenance, including Koch Foods and Pierre/Tyson Foods. Has been with Empire almost 4 years now.

James Ellington – 11 years experience in industrial maintenance, including Koch Foods and Pierre/Tyson Foods. Has been with Empire almost 4 years now.

Empire Wastewater Team

Perrin Burse – This is Perrins first position in the industrial maintenance field. Perrin has been with the company for almost over 2 years now.

Russell Saylor – Over 10 years experience in industrial maintenance, including Koch Foods and now Empire

Michael Benge – Over 8 years experience in industrial maintenance including Koch Foods and now Empire

James Rogers – This is James' first position in the industrial maintenance field. James has been with us for 2 years now.

Building Relationships for Success

- One of the most important steps to success in a wastewater operation is building a good relationship with the local governing body.
- In our case, that is the City of Mason and its public works department
- The City of Mason has been very gracious in welcoming us to their community and making it very clear they enjoy a close working relationship with the members of industry in their city.

Working Closely with the City

- We strive to maintain a close relationship with our regulatory body, the City of Mason.
- We have open lines of communication with the City and have exchanged facility tours.
- Working closely with the city, we have utilized their resources to improve our system, and used some of our expertise to help with their systems as well.

Shawn Hollon and the Public Utilities Department

- City of Mason Team:
- Shawn Hollon – Director
- Ed Smith – Assistant Director
- Josh Creech - Manager

- Shawn's team has helped us tremendously with their knowledge and expertise in wastewater systems and design to aide in our goal of continuous improvement.

- We consider the City of Mason a valuable member of our team and include him and his team in any of our major decisions regarding our treatment process.

CITY OF MASON OHIO
more than you imagine.

Our Wastewater Treatment Facility

Today, our wastewater treatment facility treats, on average, about 100,000 gallons of water per day.

This equals about 26,000,000 gallons going through our final flume and out to the City of Mason each year

We can achieve such a large amount of water treatment without a single fine through the dedication of our department to continuous improvement.

Continuous Improvements

- Continuous Improvement is the running theme in the facilities department, and if you spend any amount of time within the department, you will hear the phrase repeatedly.
- The facilities team prides itself on never settling for good enough. We are always striving to make the process at Empire more efficient, more operator friendly, and less impactful on the environment and our surroundings.

How we improve

- From the day our wastewater facility began treating water, our team set to work making improvements to the process.
- From procedures to actual system design, the facilities engineering team has made modifications to improve the performance, efficiency, and reliability of our system.
- These modifications and improvements began with routine testing and logging. These tests and rounds help us identify problems areas within the process and allow us to target these areas for improvement.

Testing

- Over the last 3 years, the Empire facilities team has compiled a series of tests and logging procedures that ensures our water treatment stays within the specs of our wastewater permit and doesn't affect our surrounding wildlife and natural resources.
- These tests and logging include twice per shift rounds, where our techs go through the entire system, documenting pump pressures, chemical inventory, ph testing, water clarity, etc.
- To partner with these rounds, we utilize a third party once per month to test our outgoing water for things like BOD's, ammonia, suspended solids, etc.

Logging and Rounds

- Our team at Empire utilizes twice per shift rounds to keep tabs on the system and how it is running
- We use these rounds to track data points throughout the system that let us know how the system is operating and to help identify problems as the begin so we can correct them before they evolve into catastrophic failures.
- These logs were created in house and are audited in house by our personnel to ensure accuracy as well as updated to reflect changes in the process, as well as through feedback from our techs.

Wastewater Rounds

- This is an example of the rounds sheet our techs complete twice per shift. This gives us data points for the tank levels, chemicals, ph, pump performance, etc.

WWTR DAILY ROUNDS SHEET

Complete this rounds sheet twice per shift, using r1 as the first round, and r2 and the second round

NAME _____ DATE _____ SHIFT _____

T2			T5			T6			MBBR		
PH	r1	r2	PH	r1	r2	PH	r1	r2	PH	r1	
GPM	r1	r2	GPM	r1	r2	GPM	r1	r2	GPM	r1	
HZ	r1	r2	HZ	r1	r2	HZ	r1	r2	HZ	r1	

Chemical Drums

Acid			GP50			Caustic			Floc		
Drum level	r1	r2	Drum level	r1	r2	Drum level	r1	r2	Drum level	r1	
Pump Running	r1	r2	Pump Running	r1	r2	Pump Running	r1	r2	Pump Running	r1	
Setpoint	r1	r2	Setpoint	r1	r2	Setpoint	r1	r2	Setpoint	r1	

If the chemical level is at or below 25% notify the incoming shift to monitor the level

Lift Station Pump 1			Lift Station Pump 2			DAF1			DAF2		
Pump on?	r1	r2	Pump on?	r1	r2	Skimmers on?	r1	r2	Skimmers on?	r1	
Auto/Hand/Of	r1	r2	Auto/Hand/Off	r1	r2	Sludge catch pan clean?	r1	r2	Sludge catch pan clean?	r1	

WALKTHROUGH				
UNUSUAL NOISE/VIBRATIONS?	Y	N	Y	N
WATER LEAKAGE?	Y	N	Y	N
ALL PUMPS RUNNING?	Y	N	Y	N
OUTGOING WATER ACCEPTABLE	Y	N	Y	N
ROOM CLEAN AND ORDERLY?	Y	N	Y	N
BYPASSES ON?	Y	N	Y	N
DRAIN COVERS IN PLACE?	Y	N	Y	N

SLUDGE TANK LEVEL %		
r1	2nd	
ODOR FANS RUNNING WITH CHEMICAL		
YES / NO r1	YES / NO r2	
EXHAUST FANS RUNNING		
YES / NO r1	YES / NO r2	
Ph Reading outgoing wate		

MISC		
OUTGOING FLOW (gal)	r1	
EMPTY ROTARY SCREEN TOTE	r1	
TAKE OUT TRASH	r1	
ODOR CHEMICAL DRUM FULL	r1	
RESET CHEMICAL USAGE	r1	

If neither lift station pump is running, check operation by using the test function on the panel. If the pump does not come on using the test functio troubleshoot by opening the panel, checking for tripped overloads and incoming power.

Check both DAF sludge catchpans for excessive buildup

Check for any water on the ground and investigate its origins

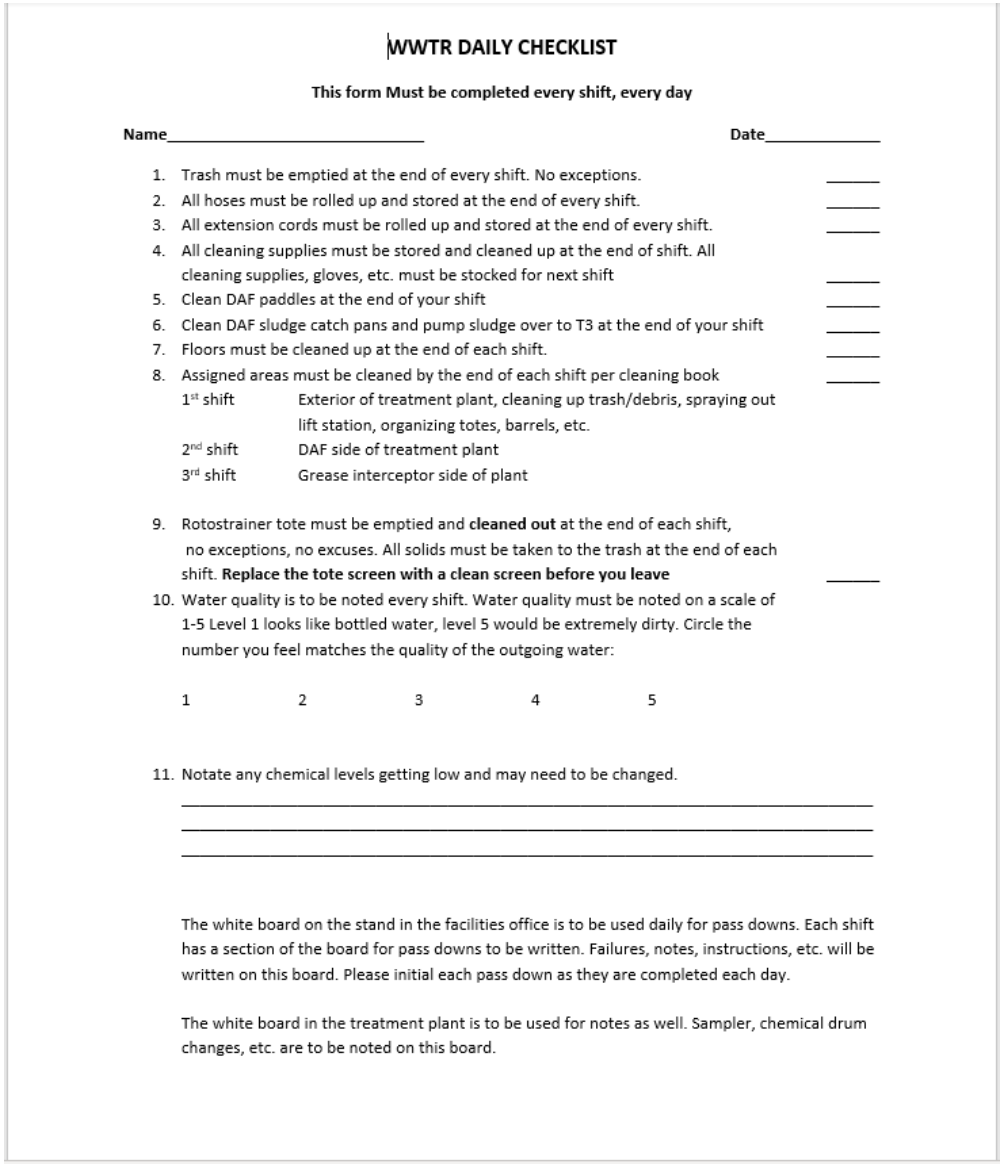
Clean up any and all trash/debris in and around the treatment plant

Complete the air compressor and kemco log with this rounds sheet

NOTES/COMMENTS:

More Documentation!

- This is another example of the checklists we complete each day
- This checklist helps with our housekeeping, which helps reduce the risk of environmental impact to our surroundings
- These logs are kept in the wastewater treatment logbook in our facility library



WWTR DAILY CHECKLIST

This form Must be completed every shift, every day

Name_____ **Date**_____

1. Trash must be emptied at the end of every shift. No exceptions. _____
2. All hoses must be rolled up and stored at the end of every shift. _____
3. All extension cords must be rolled up and stored at the end of every shift. _____
4. All cleaning supplies must be stored and cleaned up at the end of shift. All cleaning supplies, gloves, etc. must be stocked for next shift _____
5. Clean DAF paddles at the end of your shift _____
6. Clean DAF sludge catch pans and pump sludge over to T3 at the end of your shift _____
7. Floors must be cleaned up at the end of each shift. _____
8. Assigned areas must be cleaned by the end of each shift per cleaning book _____
   - 1st shift — Exterior of treatment plant, cleaning up trash/debris, spraying out lift station, organizing totes, barrels, etc.
   - 2nd shift — DAF side of treatment plant
   - 3rd shift — Grease interceptor side of plant
9. Rotostrainer tote must be emptied and **cleaned out** at the end of each shift, no exceptions, no excuses. All solids must be taken to the trash at the end of each shift. **Replace the tote screen with a clean screen before you leave** _____
10. Water quality is to be noted every shift. Water quality must be noted on a scale of 1-5 Level 1 looks like bottled water, level 5 would be extremely dirty. Circle the number you feel matches the quality of the outgoing water:

    1 2 3 4 5

11. Notate any chemical levels getting low and may need to be changed.
    _____
    _____
    _____

The white board on the stand in the facilities office is to be used daily for pass downs. Each shift has a section of the board for pass downs to be written. Failures, notes, instructions, etc. will be written on this board. Please initial each pass down as they are completed each day.

The white board in the treatment plant is to be used for notes as well. Sampler, chemical drum changes, etc. are to be noted on this board.

Drain Covers

- This shows the drain cover log we perform throughout our shifts
- Keeping our stormwater drains covered is one of our top priorities
- These drains stay covered at all times outside of rain/storms

Drain Cover Spill Control Checklist

Verify hourly that drain covers are in place and properly sealing drains - If drain cover is not properly in place, correct ASAP

Y = Yes drain cover is in place and properly sealed; N = No drain cover is not in place and properly sealed

Time	Drain Northwest of Overhead Door	Drain Northeast of Overhead Door	Drain East Outside Mandoor	Drain Beside Lift Station	Signature	Date
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N		

Recordkeeping and a PSM Mentality

Our facility employs 4 dedicated wastewater technicians at this time. These technicians are under the umbrella of the facilities maintenance department. This department is responsible for the wastewater treatment plant, the ammonia/glycol refrigeration system, the air compressor system, the fire prevention system, rooftop units, general building maintenance, etc.

Working with an ammonia system, we maintain a very stringent Process Safety Management (PSM) system. Because of this, all of our systems are managed through this level of recordkeeping and auditing.

Wastewater Records

- With this mindset, our department has records for our system dating back to startup for the wastewater system.
- All our daily logs, our Pace Analytical reports, City of Mason reports, permits, etc. are stored in our facility library to review, track, and analyze.
- In addition, all our chemical delivery paperwork, auditing, and manuals are also stored in our facility library, giving our techs access to as much information as possible.

Engineering Library

- One of the projects we are most proud of, and one that we use the most often, is our Engineering library

- Our facility houses an ammonia refrigeration system. One of the safety measures needed for managing an ammonia system is a PSM (Process Safety Management) program. This program, at its bare bones, documents all testing, changes, maintenance activities, equipment data, schematics/prints, and much more. When managed correctly, it becomes an exhaustive compilation of data we track through the life of the system.

- While the PSM system is only intended for the ammonia refrigeration system, we have incorporated the waste treatment area into our PSM system. This makes it much easier for us to record, manage, and track data from the treatment plant

Adding Personnel for Round the Clock Monitoring

- Once we had established routine logging and testing, it became obvious that we would need more help running the system. At startup, only 1 shift of techs monitored the waste treatment operations.
- We hired 4 techs exclusively for the waste treatment area. This would allow them to focus solely on the treatment process and provide around the clock monitoring, better guaranteeing our water quality and minimal impact on the environment.

Improving Through Experience

- As we worked with our system, we found more and more ways to improve the process. We've gone through our system with a fine-tooth comb, pulling out any inefficiencies we may find
- These inefficiencies include removing redundant tanks, upgrading unreliable pumps from pneumatic to electric, adding frequency drives to pumps, among many other things.
- These improvements have not only increased the amount of water we can treat each day, but also increased the dependability of our system and the quality of water we send to the city.

Facility Upgrades

- Our team has made several upgrades to our treatment facility.
- To look back at our initial startup through today, the process and facility is very different. Our original system had several inefficiencies we set about remedying.
- One of these inefficiencies was our water feed system to our DAFs

Pump and Chemical Modification

Our first order of business was our pumps and chemical addition

In its first iteration, our chemicals were injected in a mixing loop, where our water pumps pushed water through a mixing loop and then into the DAF. This greatly reduced our pump's ability to maintain the volume of water needed to keep our system running below our high-level alarms.

Removing this mixing loop and adding the chemicals in a straight discharge line allowed the pumps to maintain proper level in our holding tanks as well as increased the efficiency of our chemicals in the system.

Pneumatics and Reliability

- Our next order of business was removing unnecessary steps in the process and rearranging the room. In its first iteration, the water treatment process had 2 pneumatic pumps at critical points in the system that were not reliable.

- These pumps operated on proximity switches as a means of verifying operation, and these were prone to failure, as well as the pumps being prone to vapor locking.

- These pneumatic pumps were removed in favor of more reliable centrifugal pumps to ensure a more reliable process overall.

Transfer Tanks

These pneumatic pumps were both pumping from transfer tanks. The first, pumping the water that T6 received from DAF 1 to the T4 transfer tank, and the second pumping water from the T4 tank to the Moving Bed Biofilm Reactor (MBBR).

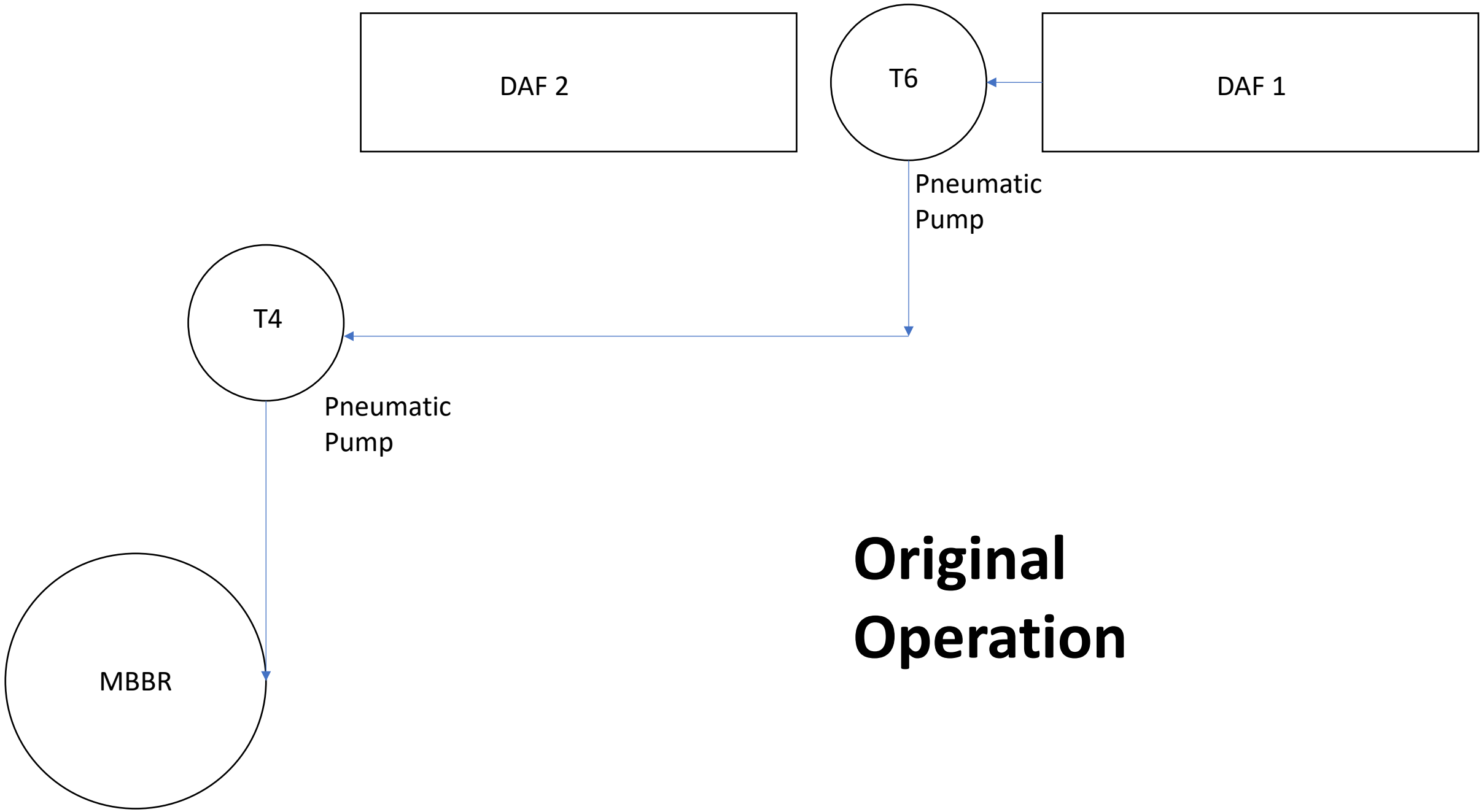
We were able to rectify two separate issues in the process in one move involving these tanks. The first being a design flaw, and the second being an inefficiency.

Transfer Tanks (cont.)

To begin, the T-6 tank receiving water from DAF-1, was prone to overflowing due to its height and water gravity feeding to the tank from the DAF.

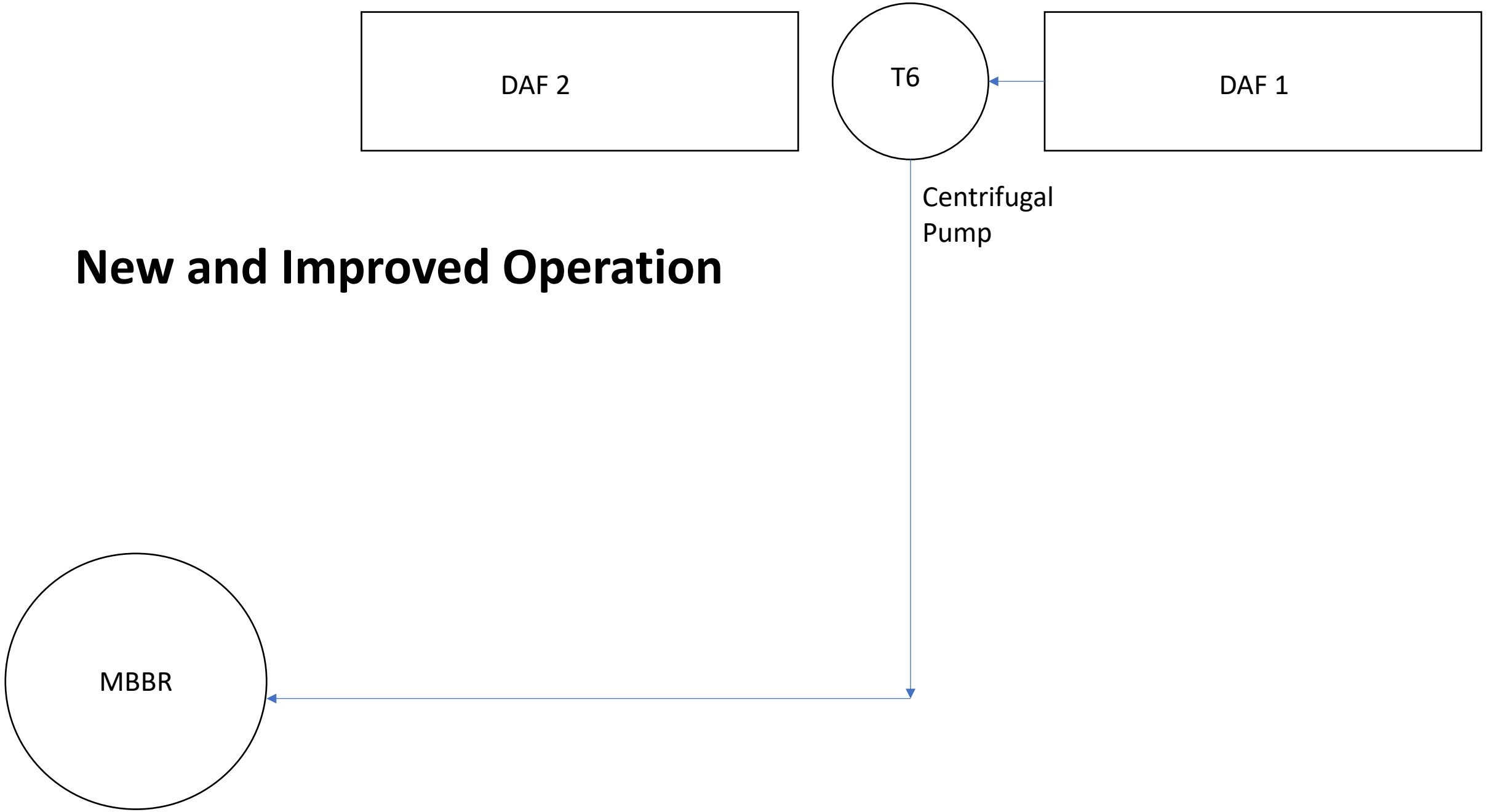
The T-4 tank, where it was in the system, was an extra transfer step that did not add any chemical, or any improvements to our water quality.

In one move, we removed the T-4 tank and its unreliable pneumatic pump, as well as T-6 and its pump. We then placed the T-4 in T-6's place, as the T-4 tank was much taller and could therefor handle the gravity feed from the DAF without overflowing



Original Operation

New and Improved Operation



T6 Tank New vs. Old

As seen in this illustration, the blue tank shown here represents the approximate size of the original T6 tank.

The white tank is the new T6 tank, which is the T4 tank that was redundant and removed from the process.

Backups and Redundancy

- One major cause of accidental spill we have identified is pump/float failure. If a float fails and allows a tank to continue to fill to the point of overflow, that would obviously be a point of environmental impact, as the overflow could potentially make its way to a drain
- To combat this, we have installed several backup sump pumps, which would automatically come on before the tank would overflow, pumping the water to the next safe tank.

Switching Chemical Companies

- At startup, we used exclusively DMP chemicals in our system, as that was the chemical used to start the system
- After becoming more comfortable with the system and how it runs, we began researching and reaching out to different chemical companies, looking for better pricing and performance.
- We began working with D3W, who now supplies the chemicals used in our system.
- D3W has been a very productive partner in our system, providing cost effective solutions and an incredible knowledge and expertise in helping us run our system at its highest efficiency

What Makes Us Click

Our chemical play a vital role in the success of our operation.

In our process, we use 4 chemicals to ensure our water stays within our permit limits and stays clean as we send it out to the City of Mason.

We created signs that are posted at the chemical storage locations for training purposes, as well as for tours, etc.

These signs identify the chemical, include a brief explanation of what they do in the system, and direct the reader to more information on the chemical and where to find that information.

D3W 256

Flocculant

DAF 1 and 2

Binds to the bonded solids and floats them to the top of the DAF for removal

Works in conjunction with DMP 50

See SDS book in facilities office, unit #3 shelf 3

D3W 50GP

CHEM 1

DAF 1 AND 2

Bonds solids in the DAF together for easier removal and disposal

Works in tandem with DMP 256 flocculant

See SDS book in facilities office, unit #3 shelf 3

D3W 22011

CAUSTIC

TRANSFER TANK 2/MBBR

Used to raise the PH of the water to bring within permit range

See SDS book in facilities office, unit #3 shelf 3

D3W 22108

ACID

TRANSFER TANK 2

Used to lower the PH of the water to bring within permit limits

See SDS book in facilities office, unit #3 shelf 3

D3W DP4030

DEFOAMER

MBBR

Used to mitigate foam inside the MBBR

See SDS book in facilities office, unit #3 shelf 3

Peristaltic Chemical Pumps

- For chemical injection, we utilize peristaltic pumps
- Analyzing the data, we found that these pumps can sometimes lag in their distribution, pushing a slug of chemical into the system, and then allowing several gallons go untreated followed by another slug of chemical
- To combat this, we installed an orifice in the discharge line, while also adjusting the titration.
- This allowed for a more consistent, uniform chemical flow into the process, treating every gallon of water intended.

Regular Maintenance

- Through experience, we have developed a maintenance routine that keeps our treatment process running at optimum efficiency.
- Utilizing our twice per shift logs, we can recognize when pumps need cleaned, probes must be cleaned, and when pumps are not operating at a high level
- Along with these routine maintenance procedures, we have also developed a parts list of items we keep on hand to keep our facility running.
- This includes important pumps, probes, seals, and bearings, as well as a variety of pipe and pipe fittings so our treatment plant is always ready to run.

Adding pigtails to motors

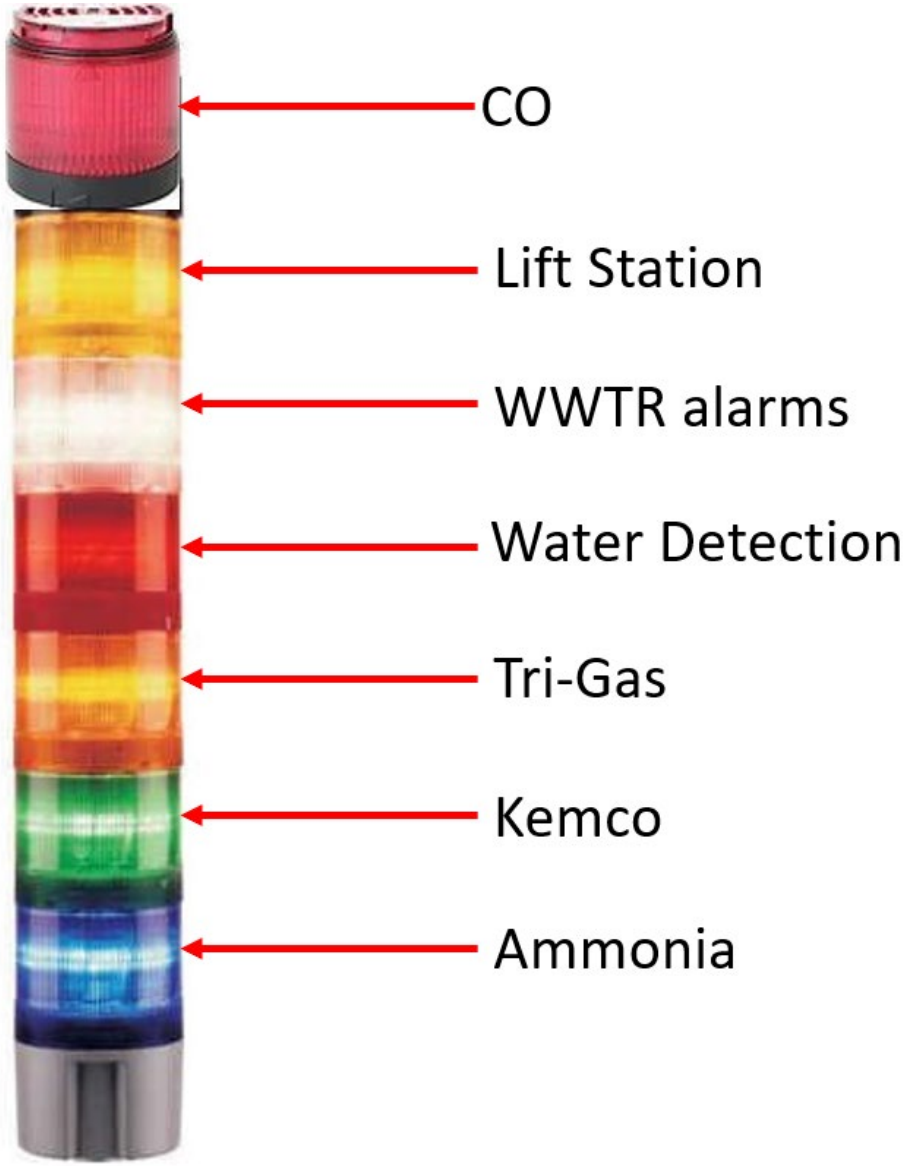
- In line with upgrades and routine maintenance, another addition we have made is pig tailing our pump motors. This entails adding a cord and plug end to our motors, as well as the disconnect servicing that motor. This allows the motors to be plugged in instead of being hardwired to a disconnect.
- The benefit of this is twofold. It allows for quick replacement if a motor was to go bad, allowing for minimal downtime. The secondary benefit being that pump cleaning and maintenance is made quicker and easier by the tech being able to remove the entire pump and motor assembly to be worked on at a benchtop instead of in place.

Adding pigtails to motors

- This waterproof plug attached to the pigtail, allowing our techs to unplug and plug in pumps when a pump goes bad, or to remove the pump to clean it, replace bearings, etc.

Stack light

- One of our more reactionary upgrades has been the stack we utilize for major alarms throughout our facility.
- As you can see pictured, we have a tower light with 7 lights on it, each on designated for a different area of the plant.



Stack light part 2

The stack light is in our facility office area, in a visible location so that anyone working in the office, or passing through, will see and hear an alarm that will alert them to a problem in the plant.

For our wastewater system, we utilize one alarm for our high-level lift station float, to alert our techs to a high-level situation, and another for waste treatment alarms, such as pumps tripping, high PH, etc.

Training

In-line with our recordkeeping and the PSM attitude, we also train our employees on a continual basis

Utilizing things like weekly safety toolbox talks and planned quarterly and annual training coordinated with our safety team, we ensure our techs are equipped to work as safely as possible each day, returning home in the same condition as when they arrived at work

Our safety records are kept in our facility library, with annual trainings like lockout tagout, powered equipment training, etc. stored in the safety departments records

On the Job Training

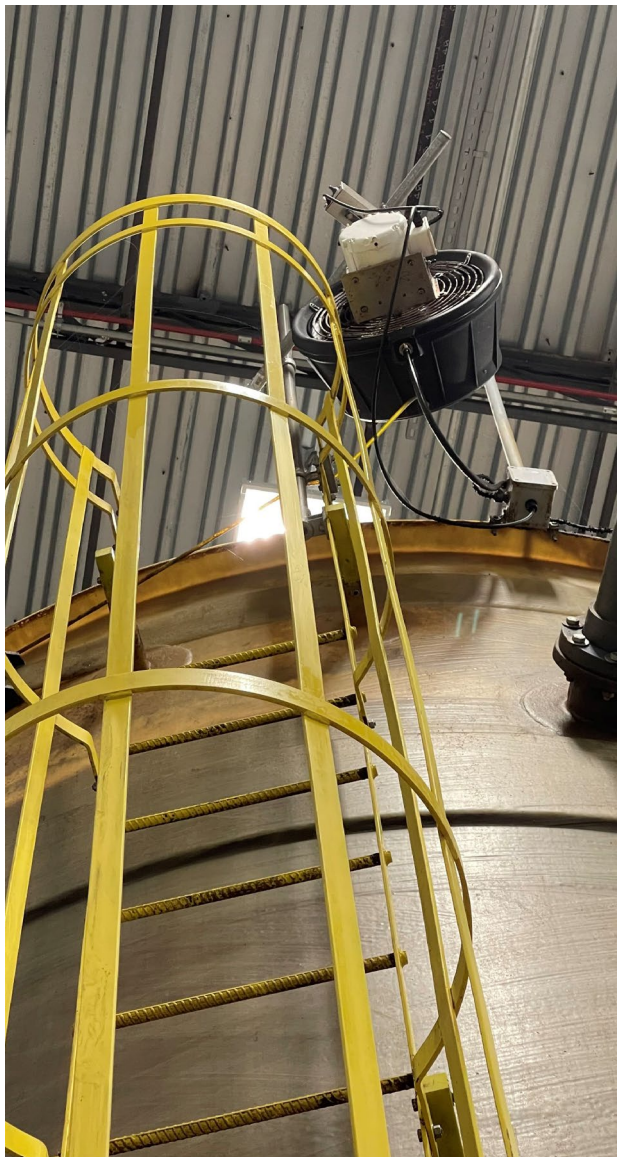
- For our less experienced techs, we've devised a training program working with our techs who have been in the field for a time
- We are lucky to have 3 techs that have worked with the system from its startup and have completed the upgrades outlined in this presentation. These techs know this system because they have redesigned the system themselves. All three have contributed to a training program that has proven to work for the newer techs we have brought in.
- All our new techs are paired with one of these techs, completing initial training as well as updated training on process changes, system updates, etc.

Helping Our Surroundings

- Wastewater is a stinky business. Working with cleaning water, water that is used to wash away organic matter and clean our process machines, can be a messy job.
- To combat things like the smell, we utilize neutralizer fans on the inside and outside of our treatment facility.
- This mitigates complaints from surrounding businesses and residential areas about the smell associated with water treatment.

Neutralizer Fans

- These are two examples of our neutralizer fans.
- On the left is an example of our fans on the exterior of the facility. These fans are mounted to a tote full of neutralizer. The neutralizer is then pumped to the fan as it runs, dispersing the material into the air and improving the smell quality.
- On the right is a fan we have mounted on the interior of the facility. A pump mounted at floor level pumps the neutralizer up to the fan to be dispersed around the treatment plant



D3W industries

Scent Fans

- Utilizing these fans, the neutralizing agent neutralizes the odor from the treatment process and puts a pleasant scent in the air.
- For fun, and the enjoyment of the surrounding community, we rotate the scents based on the season, such as a pine scent around winter and the holidays, and a spruce smell in the spring

Keeping Ourselves in Check

- In an effort to keep our effect on our surroundings to a minimum, we use hydrogen gas sensors in our main outgoing water manhole and along the fence line near out treatment facility.
- These sensors track readings 24/7. We can then pull this data from the sensors and track if and when any gas spikes occurred and line them up with incidents that may have occurred in the treatment process.

King Hauling

- Another important relationship we have built is with King Hauling
- King hauls our organic waste generated from the treatment process
- We also utilize King for things like cleaning/pressure washing our holding tanks and pits

Environmental Impact

- At Empire we strive to have zero impact on the environment around us
- We take special care, as shown, to not pollute any water streams or wildlife surrounding the facility with our wastewater or chemicals involved in our process.
- Inline with this mindset, we set ourselves on projects that would mitigate risks we may have to pollution in our process.

Reducing the Effect on Our Surroundings

- In addition to the smells associated with water treatment, the other issue many plants have is allowing wastewater to enter the storm sewer drains.
- To combat this, along with proper procedures and around the clock in person monitoring, we keep our storm drains covered with drain covers to not allow wastewater into the sewer system
- These covers are a part of the twice per shift rounds and are removed in the event of rainfall and replaced once the rain has stopped.

Lift Station Improvements

- Our lift station, a pit outside the treatment plant facility, houses 2 pumps that pump the wastewater from the plant to the water treatment process, was an area we identified as a possible risk area.
- If the lift station pumps failed, the pit could overflow, allowing water into our dock area, potentially pollution storm sewer drains that were not near our water treatment facility, therefore not covered by sewer drain covers as mentioned previously.

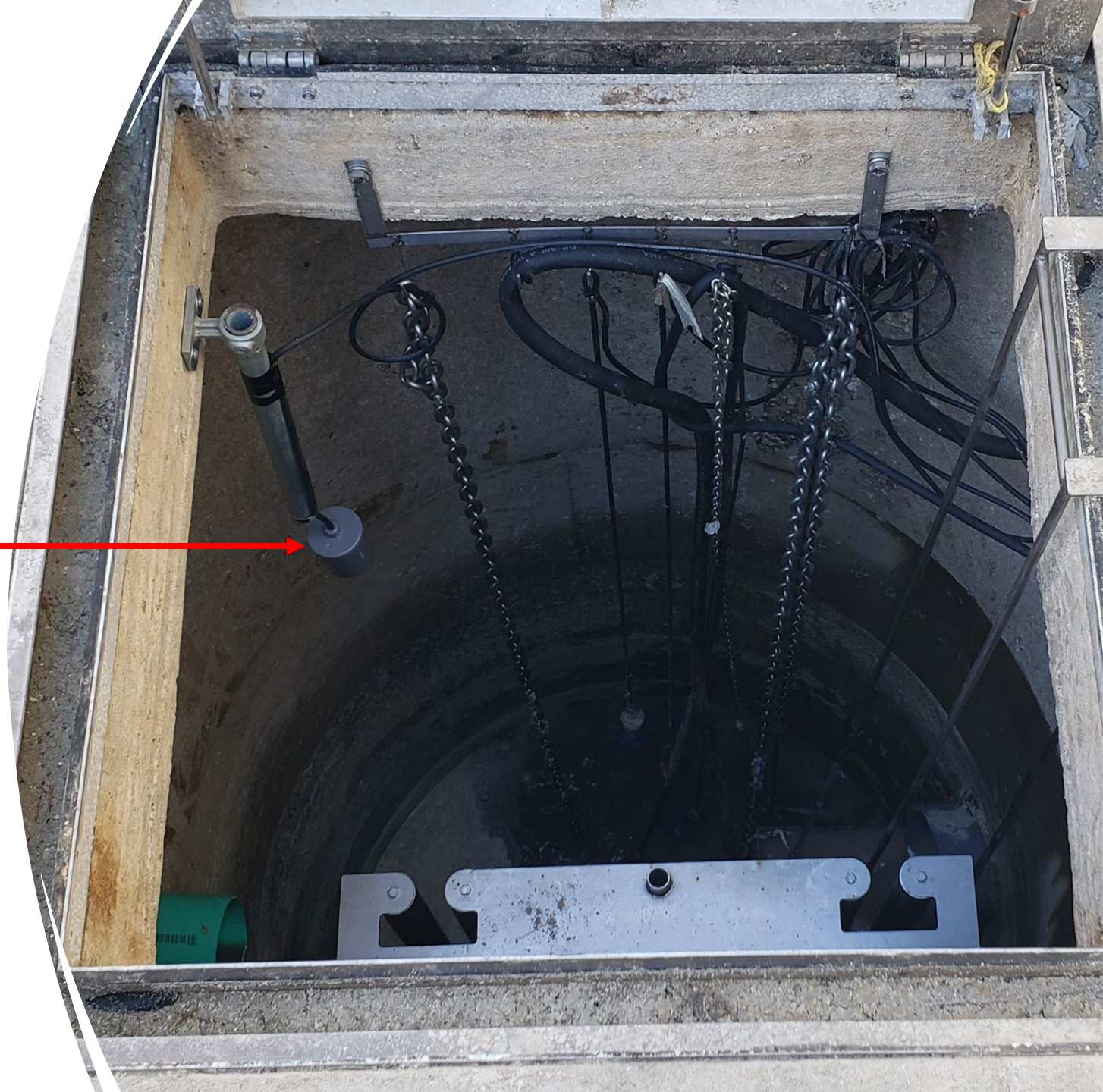
Lift Station Upgrade

- To combat this risk, we have erected a containment wall around the lift station. This containment wall is designed to handle the overflow of the lift station in conjunction with the lift station safeties upgrades we completed

High-level float

- This float located on the left-hand side of the lift station is the accessory float we added

- As you can see, the float is located near the top of the pit, keeping in mind the concrete barrier erected around the manhole to account for water drainage after the water pumps have been shutdown through the relay.



Lift Station Safeties

- In tandem with the containment wall for the lift station, we also installed an accessory high-level float.
- This high-level float is tied to a relay on our hot water pumps. This relay will then turn off the hot water pumps if the level in the lift station gets too high, while also triggering an alarm to alert our technicians to a problem in the lift station.
- This float, working together with the containment wall, virtually eliminates any opportunity for untreated water from the lift station to get into the storm sewer system

Pace Analytical

Pace Analytical is a 3rd party lab testing company that helps us regulate our water treatment process.

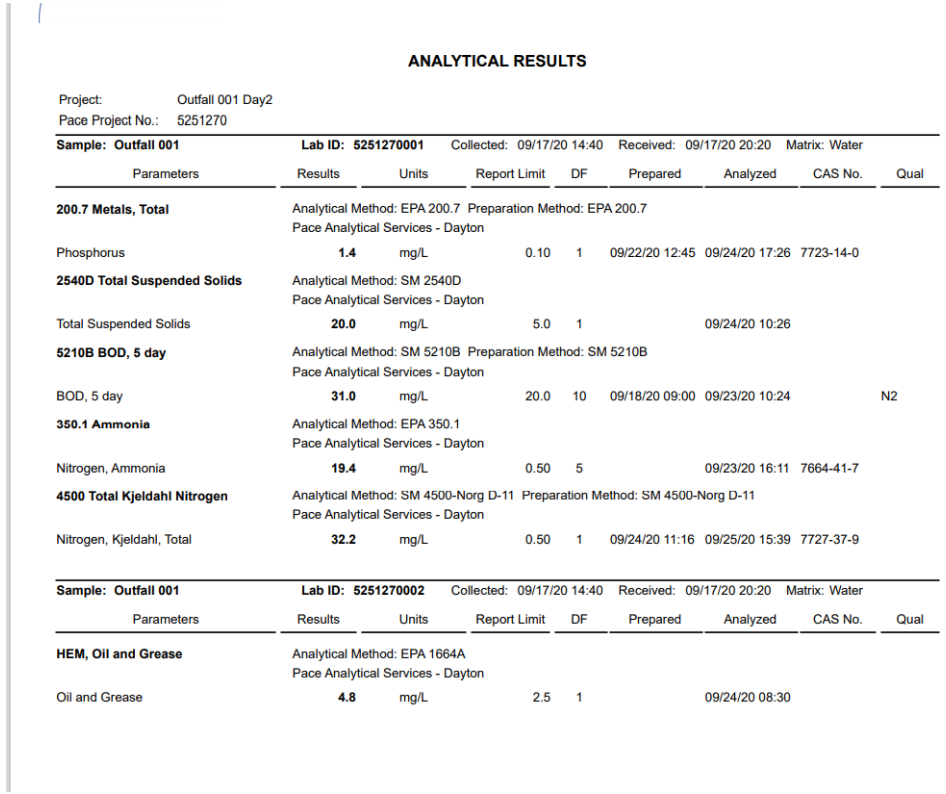
Every month, Pace installs a sampler in our outgoing water manhole to randomly sample the water being discharged to the City over a three-day period.

We use these sample readings to make adjustments to our process as needed, be it changing our chemicals, adjusting our mixtures, etc.

We have yet to have a negative report for the year of 2021.

Pace Results

- These results pages show progressions made throughout the life of our system. Each month we get our results and review them as a group to discuss the results and changes we can make to improve the numbers even further. While our numbers are always within our permit limits, we always want to improve ourselves and these results are a good measuring stick for our efforts.



ANALYTICAL RESULTS

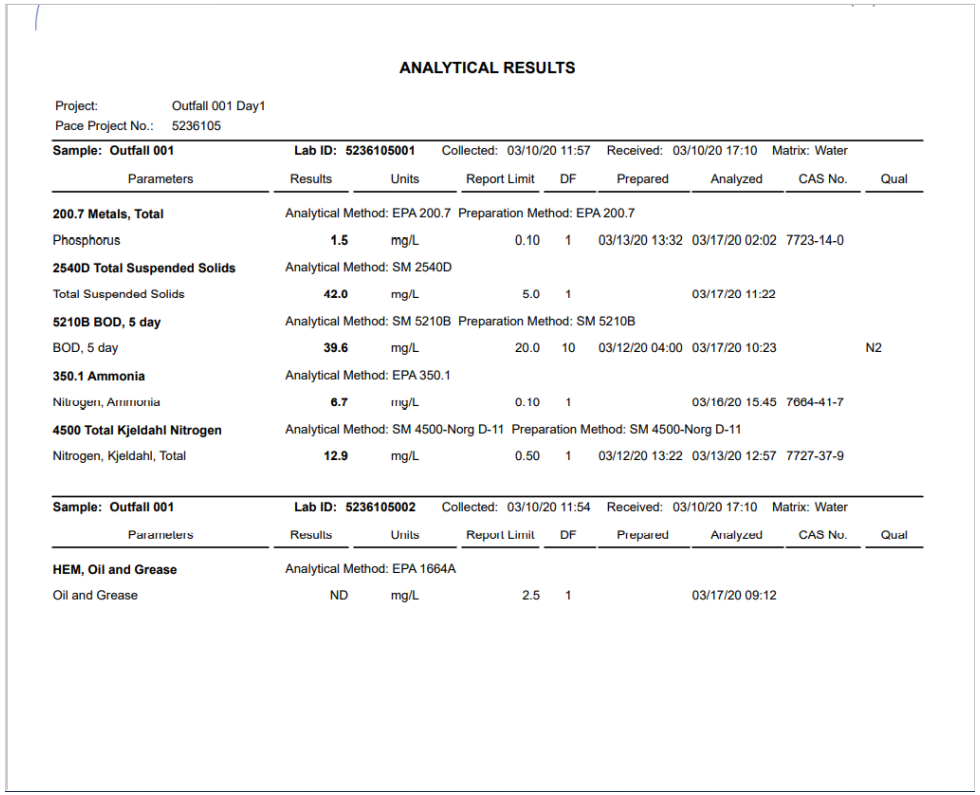
Project: Outfall 001 Day2
Pace Project No.: 5251270

Sample: Outfall 001 **Lab ID: 5251270001** Collected: 09/17/20 14:40 Received: 09/17/20 20:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Dayton							
Phosphorus	**1.4**	mg/L	0.10	1	09/22/20 12:45	09/24/20 17:26	7723-14-0	
2540D Total Suspended Solids	Analytical Method: SM 2540D Pace Analytical Services - Dayton							
Total Suspended Solids	**20.0**	mg/L	5.0	1		09/24/20 10:26		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B Pace Analytical Services - Dayton							
BOD, 5 day	**31.0**	mg/L	20.0	10	09/18/20 09:00	09/23/20 10:24		N2
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Dayton							
Nitrogen, Ammonia	**19.4**	mg/L	0.50	5		09/23/20 16:11	7664-41-7	
4500 Total Kjeldahl Nitrogen	Analytical Method: SM 4500-Norg D-11 Preparation Method: SM 4500-Norg D-11 Pace Analytical Services - Dayton							
Nitrogen, Kjeldahl, Total	**32.2**	mg/L	0.50	1	09/24/20 11:16	09/25/20 15:39	7727-37-9	

Sample: Outfall 001 **Lab ID: 5251270002** Collected: 09/17/20 14:40 Received: 09/17/20 20:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
HEM, Oil and Grease	Analytical Method: EPA 1664A Pace Analytical Services - Dayton							
Oil and Grease	**4.8**	mg/L	2.5	1		09/24/20 08:30		



ANALYTICAL RESULTS

Project: Outfall 001 Day1
Pace Project No.: 5236105

Sample: Outfall 001 **Lab ID: 5236105001** Collected: 03/10/20 11:57 Received: 03/10/20 17:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Phosphorus	**1.5**	mg/L	0.10	1	03/13/20 13:32	03/17/20 02:02	7723-14-0	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**42.0**	mg/L	5.0	1		03/17/20 11:22		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	**39.6**	mg/L	20.0	10	03/12/20 04:00	03/17/20 10:23		N2
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**6.7**	mg/L	0.10	1		03/16/20 15:45	7664-41-7	
4500 Total Kjeldahl Nitrogen	Analytical Method: SM 4500-Norg D-11 Preparation Method: SM 4500-Norg D-11							
Nitrogen, Kjeldahl, Total	**12.9**	mg/L	0.50	1	03/12/20 13:22	03/13/20 12:57	7727-37-9	

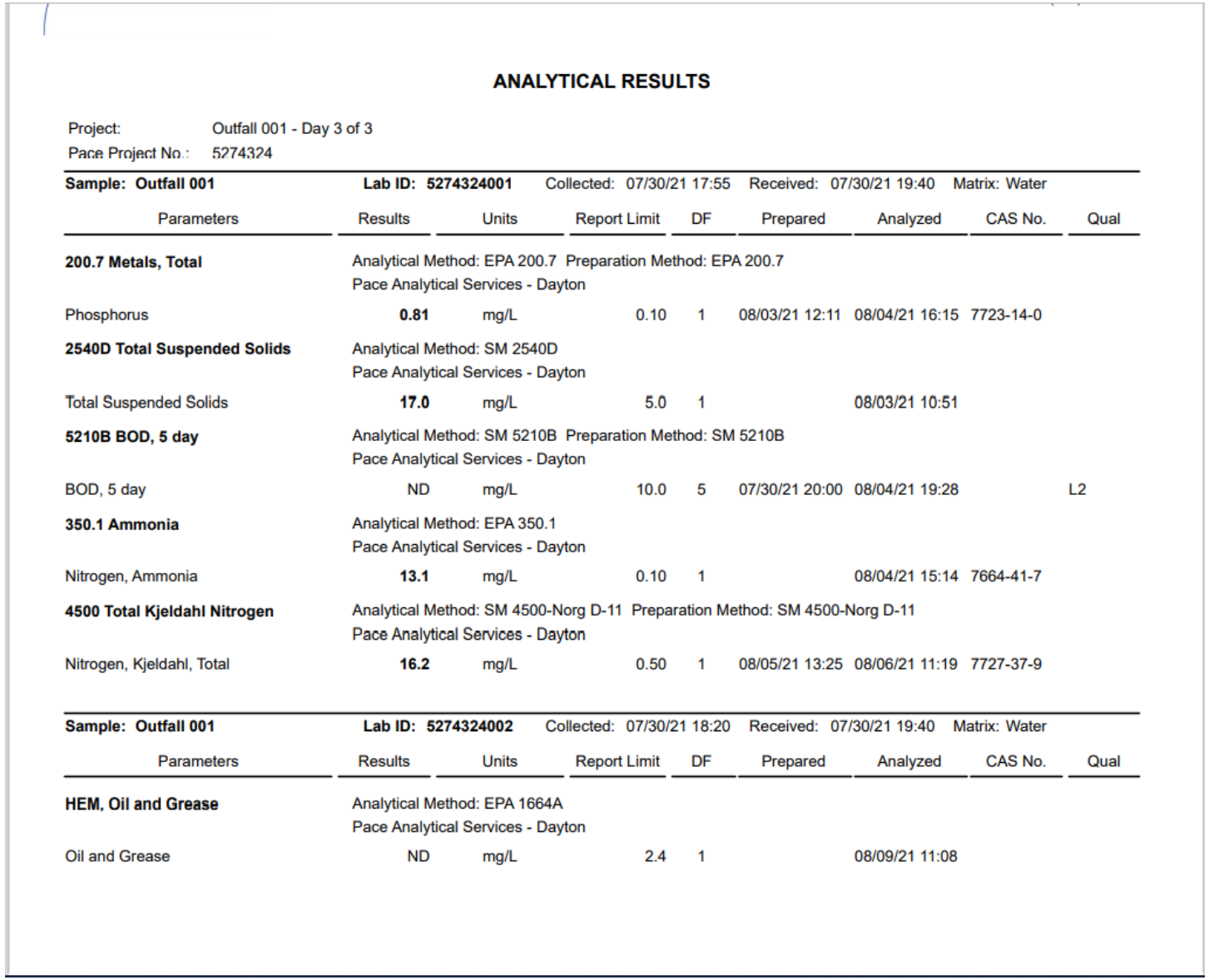
Sample: Outfall 001 **Lab ID: 5236105002** Collected: 03/10/20 11:54 Received: 03/10/20 17:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
HEM, Oil and Grease	Analytical Method: EPA 1664A							
Oil and Grease	ND	mg/L	2.5	1		03/17/20 09:12		

Results Analysis

- This shows an excerpt from our most recent Pace report showing we are still within our permit limits

- In discussing these results with the City of Mason, we are both pleased with the data we have received and are looking to reduce our numbers even further in the future.



ANALYTICAL RESULTS

Project: Outfall 001 - Day 3 of 3
Pace Project No.: 5274324

Sample: Outfall 001 **Lab ID: 5274324001** Collected: 07/30/21 17:55 Received: 07/30/21 19:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Dayton							
Phosphorus	**0.81**	mg/L	0.10	1	08/03/21 12:11	08/04/21 16:15	7723-14-0	
2540D Total Suspended Solids	Analytical Method: SM 2540D Pace Analytical Services - Dayton							
Total Suspended Solids	**17.0**	mg/L	5.0	1		08/03/21 10:51		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B Pace Analytical Services - Dayton							
BOD, 5 day	ND	mg/L	10.0	5	07/30/21 20:00	08/04/21 19:28		L2
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Dayton							
Nitrogen, Ammonia	**13.1**	mg/L	0.10	1		08/04/21 15:14	7664-41-7	
4500 Total Kjeldahl Nitrogen	Analytical Method: SM 4500-Norg D-11 Preparation Method: SM 4500-Norg D-11 Pace Analytical Services - Dayton							
Nitrogen, Kjeldahl, Total	**16.2**	mg/L	0.50	1	08/05/21 13:25	08/06/21 11:19	7727-37-9	

Sample: Outfall 001 **Lab ID: 5274324002** Collected: 07/30/21 18:20 Received: 07/30/21 19:40 Matrix: Water

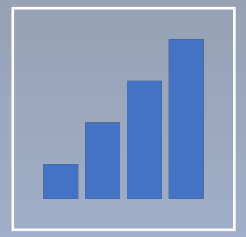
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
HEM, Oil and Grease	Analytical Method: EPA 1664A Pace Analytical Services - Dayton							
Oil and Grease	ND	mg/L	2.4	1		08/09/21 11:08		

New Testing Standards

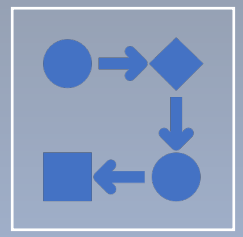
With new testing requirements going into effect, we have already begun tracking the data in the new standard. We have found that we are well below the new standard set, but as with everything else, we fell we can get even better.

We have pulled all our reporting to build a data set to track where these numbers have been through the life of the system and are in the process of identifying how to reduce these numbers even further, with a goal of undetectable levels for each.

Always Improving



We believe our success is dictated by our drive to continuously get better each day, week, and month



Our systems are never good enough, and we are always looking for new ways to improve ourselves, whether it's improving the process, improving the controls we have in place, or improving the cost.

We review the data we get from our techs as well as the Pace analytical reports to identify areas we feel we can improve.

Our future projects include….

1

Looking into sludge decanting, removing the water from our sludge and creating a drier organic material, reducing the volume of organic material sent offsite.

2

Experimenting with different organic removal, like different bacteria and bugs in our MBBR. Using more of our waste as food rather than removing the sludge and disposing of it

3

Expanding our logging procedures to build a larger data set. Being able to track more data points will only help us is pinpointing areas of the process we can improve

Conclusion

In conclusion, the key factors in our success are:

Continuous Improvement

Building Relationships within our community

A positive attitude towards environmental conservation