MT2P: Sacred Waters Brewing Company

Employer: Seth Orr
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MTP2 MONTANA POLLUTION PREVENTION PROGRAM

EMPOWERING BUSINESSES TO BE PART OF THE SOLUTION, NOT THE POLLUTION.

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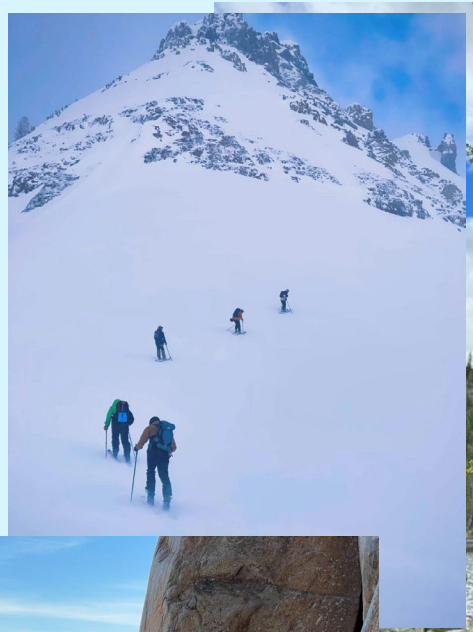
About me

- Senior studying Environmental Engineering & Psychology
- Interest in EPA internship program
  - Water Resource Engineering
  - Wildlife Habitat Reclamation
  - Waste Management
- Protect & preserve Montana



Significance

Sacred Waters is part of the **Food & Beverage** industry. Specifically, they are a **Micro-Brewpub** according to the Brewers Association.

Water

- Cleaning
- Beer
- Canning
- Watering Crops

Energy

- Water Pump
- Lights
- Temperature Control Equipment

Land

- Restaurant & Brewery
- Parking Lots
- Hops Fields
- Drainage Field

Solid Waste

- Hops
- Grains
- Cans
- Food
- Packaging

Brewmasters: Seth Orr, Marty Vollmer, Kylie Mortenson

Founder & Cofounder: Jordan and Kirk Gentry

Water & Hops!!

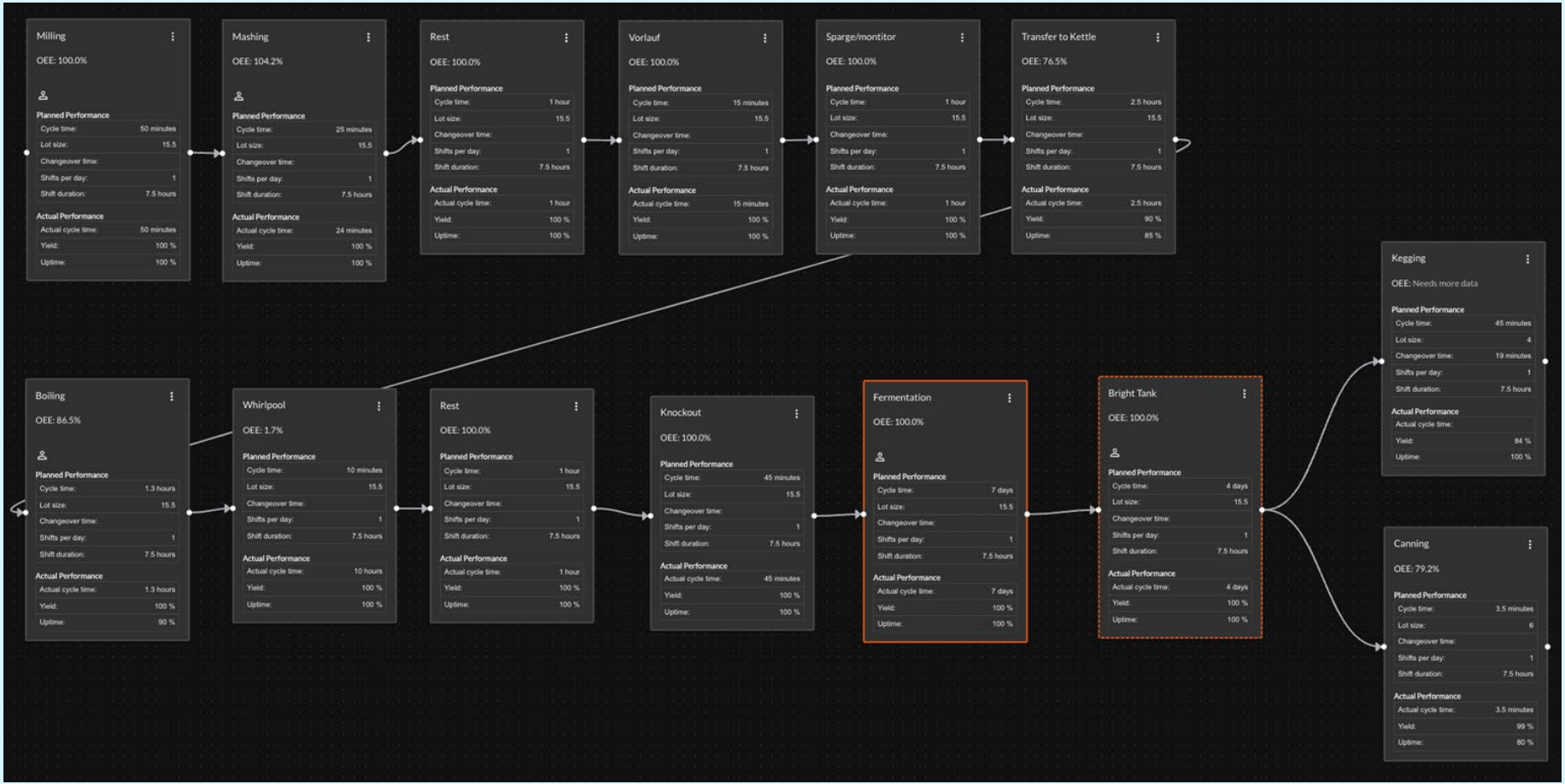
General Manager: Jackie Evans

The Team

- 12 beers on tap, 3 main beers canned
  - Catch'em Lager
  - **Hungry Horse Hazy IPA**
  - The Bob India Pale Ale
- Opportunities
  - 150 gal discharge limit
  - 4 new brew tanks
  - Septic limitations

(Casey Kreider/Daily Inter Lake)

Value Stream Mapping

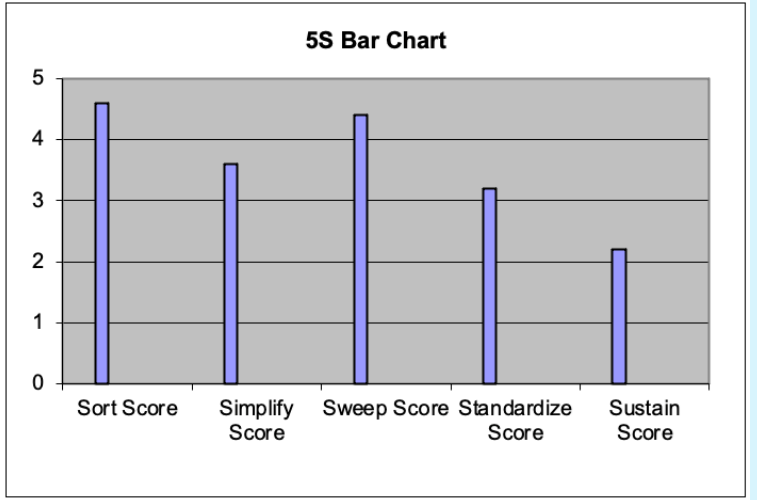


5S Audit: Brewhouse

5S ScoreCard	Area: Brewery	Prior Score:NA
Date: 6/24/24	Auditor: Jon deHoop	Score: 3.6

1=No Evidence 2=Little Evidence 3= Main processes meet requirements
4=Main and a few auxiliary processes meet requirements
5=All processes meet requirements

		NO.	Evaluation Criteria	1	2	3	4	5	Observations/Evidence
Sort Total = __23__ / 5 = __4.6__	"Separate necessary from unnecessary"	1	"Junk" drawers and catch-alls have been eliminated.				4		Mill room, back of grain room, white cabinets organized by shelf with no labels
		2	Obsolete documention is purged from area. All information posted on the bulletin boards/walls is current.					5	White board schedule updated every 2-3 weeks
		3	All tools and supplies are in regular use.					5	Mill room contains spare parts and extra equipment
		4	All excessive inventory has been eliminated.					5	if anything, a lack of inventory
		5	Evidence of regular sorting exists. If a Red Tag area exists, it is clearly marked and has schedule for disposition posted.				4		No red tagging area, regular sorting occurs in slow season
Set in Order Total = __14__ / 5 = __2.8__	"A place for everything and everything in it's place"	6	Equipment/supplies are located at the point of use and by frequency of use.				4		Grain storage far from mill (busy season), keg clean process is spread out, Lab/sink equipment together
		7	All shelves, frequently used items, etc. are clearly labeled as to content and responsibility of control and revision.			3			Cabinet, Grain, Mill shelves not labeled.
		8	Common areas and aisles are identified and lclearly marked.				4		Not labeled but obvious walkways
		9	Clear indicators of max. and min. inventory quantities exist. Storage areas contain clear repenishment instructions.			3			No max/min or instructions but inventory is recorded well
		10	Open storage of all raw material, WIP, and finished goods is well organized and labeled.				4		Kegs not labeled but organized and obvious which ones are empty/dirty
Shine Total = __21__ / 5 = __4.2__	"Daily cleaning and inspection of area and equipment"	11	Common areas and aisles are kept clean and orderly. Fire Extinguishers, exits, and control panels are unobstructed.					5	3 extinguishers, exit labeled and clear, control panels clear, hoses on the ground in walkways but it's a brewery
		12	All shelves, desks are kept clean. No items are unidentified or laying on top of cabinets/shelves/tables.			3			Stuff on top of lab cabinets and grain/mill room shelves but brewing area is clear
		13	It is visually obvious what items are ready for work, what items are in work, and what items are finished.					5	kegs that need cleaning along the wall, clean kegs in walk-in without collars, finished kegs in separate area in walk-in
		14	The current status of the area is visually obvious. Is the area ahead, behind, how does the work flow?					5	Beer travels in mostly circular pattern, clipboards show what stage of the process a tank is in
		15	Due to the use of visual control methods it is easy to distinguish what belongs in the area and what does not.					4	Lack of purposful visual controls but it is obvious when a keg is finished vs dirty
Standardize Total = __16__ / 5 = __3.2__	"Eliminate variation, create rules for first 3 - S's"	16	Cleaning and checking are completed routinely per a controlled checklist.			3			Routinely clean but team has checklist memorized
		17	There is evidence of a standard process for each product.			3			changes for every batch, rely on experience to brew, keg cleaning and testing have written instructions
		18	There are Standard work/operation instructions at all work stations.			3			Keg cleaning and pH/yeast testing have written instructions
		19	Visual controls are consistent in appearance throughout the work area - i.e. same colors mean same things.			3			no color coordination but clear as to what is finished
		20	Minimizes the work required to maintain the first 3S's by insuring waste cannot accumulate over time.				4		trash bins/waste are quickly removed
Sustain Total = __11__ / 5 = __2.2__	"Maintain improvements and look for opportunities to improve"	21	Internal Audits are performed at scheduled intervals and are on-time and current.		2				No 5S audits but unofficial walkthroughs
		22	External Audits are performed at scheduled intervals and are on-time and current.				4		no 5S audits but health department inspections performed yearly
		23	5S Audit Scores are displayed in work area and communicated regularly.	1					No 5S audits conducted or displayed
		24	Methods and evidence exists to continue to improve. Sorting events continue to happen, Visual Controls are improved, etc.		2				Sorting and deep cleaning happens in slower season
		25	It is apparent that Standard Work, Cleaning Checklists, etc. are stricktly followed		2				Standard work operations for most tasks, cleaning is done without checklist



Calculations	
Sort Score	4.6
Simplify Score	3.6
Sweep Score	4.4
Standardize Score	3.2
Sustain Score	2.2
Total	**18**
Total / 5= 5S Score	**3.6**

Identified P2 Areas of Focus

Water Usage

Tank preparation, clean in place procedures, and the canning process contribute to water

Hop Blow-off

Pellets are added during the fermentation process and discarded after.

Canning Waste Streams

Water

Cans are rinsed to clear out any possible debris. Conveyor belts are rinsed to prevent buildup

Low fills

Cans that do not reach the weight requirement to go to sale

Energy

Whole system run on 4 electric motors. Energy bill includes all three businesses of the building.

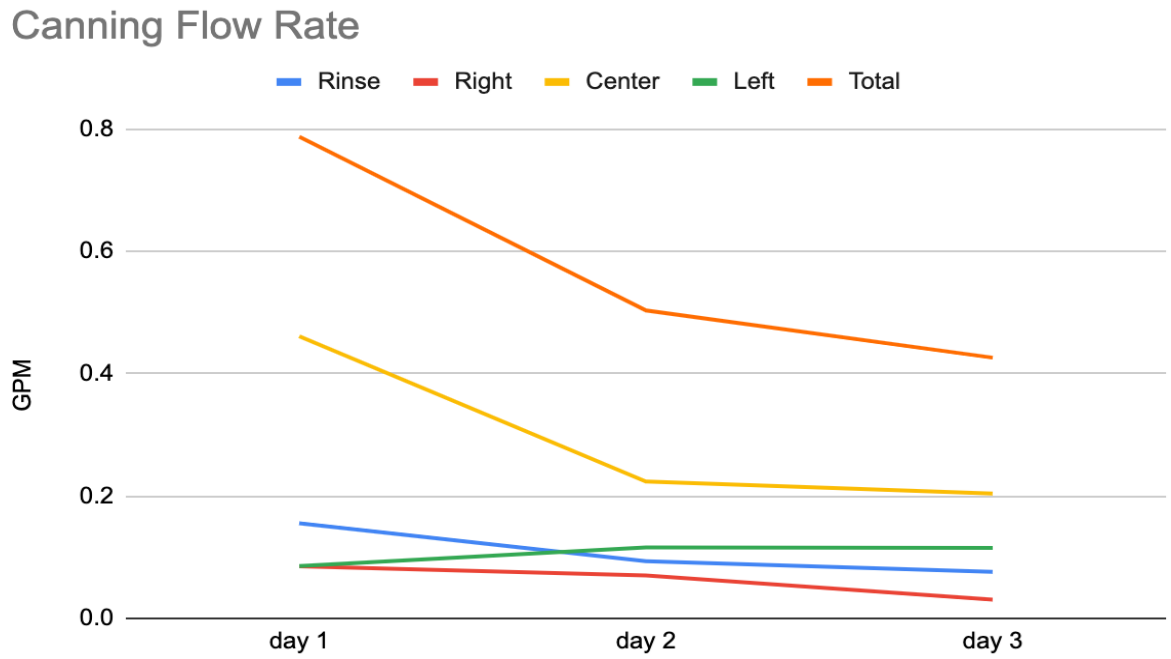
CO_2

CO_2 purge before filling with beer, oxygen is a tasty beers worst enemy

Cardboard

Case flats, can pallets

Trials and Results



46%

Reduction of water usage

Day 1: Realization of problem
Day 2: Slight adjustments
Day 3: Absolute minimum

Hop Blow-off

- Storage
  - Collected in 5 gallon buckets
  - Dumped into underground holding tank
  - Chemicals added to inhibit bacterial growth
- Disposal
  - A-1 Sanitation Company
  - Once every 4-6 weeks
  - Brought to landfill

P2 Recommendations

Flow Rate Monitors

Inline flow rate meters installed at each water nozzle, monitored throughout canning

Composting

Collect hop blow-off and grain sacks for Dirt Rich Composting

P2 Outcomes

Recommended P2 Actions	If Implemented:					If Not Implemented:	
	$		Annual Reductions				
	One-time Cost to Implement ($)	Annual Savings from P2 Action ($)	Water use (gal.)	Solid Organic Waste Pollution (lbs)	Solid Waste Pollution (lbs)	Barrier to Implement	Plans to Implement within 5 years? (pick Y/N)
Inline Water Flow Meter	77.28	-	3944	-	-	-	Y
Composting Hop Blow-off	12	3680	-	16,380	-	Cost / Extra work for team	Y
Reusing Grain bags for compost	-	-	-	-	1111	Dirt Rich Demand	Y

Additional Suggestions

Recycling Cans

Flawed Cans from the canning process are collected and recycled but restaurant does not offer recycling bins.

Composting Food Waste

Along with the hop blow-off, food scraps from the restaurant side could be composted.

Motion Sensor Lights

Lights are usually kept on in the walk-in, mill room, and grain room

Grain Silos

Would eliminate waste from grain sacks and improve ergonomics

Recommendations & Reflections

- Personal Learning
  - When to say no and change directions
  - Time management
  - Brewing process
- Future P2 Interns
  - Don’t be afraid to ask questions
  - Look outside your business for solutions
  - Figure out utility bills early
  - Visit your business before the 10 weeks start

Acknowledgements

I would like to acknowledge that the state of Montana is the traditional and ancestral homeland of many Indigenous nations, including the **Apsáalooke** (Crow), **Assiniboine**, **Blackfeet**, **Chippewa**, **Cree**, **Ktunaxa** (Kootenai), **Lakota**, **Little Shell Chippewa**, **Nakoda**, **Northern Cheyenne**, **Pend d'Oreille**, **Séliš** (Salish), and others who have lived on and stewarded this land for thousands of years.

By acknowledging this land I acknowledge the responsibility we share towards reconciliation, respect, and justice for the indigenous people of the **past, present, and future.**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY


THE WILD ONES
CATCH 'EM
5% ABV
LAGER
SACRED WATERS
BREWING CO
HUNGRY HORSE
6.8% ABV
HAZY IPA
SACRED WATERS
THE BOB
6.5% ABV
INDIA PALE ALE
SACRED WATERS
BREWING CO

Questions?