Briess Malt & Ingredients Co.

Environmental Management System Report

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Executive summary

Briess Malt & Ingredients Co. was accepted to the Green Tier program in 2012. Since then, Briess has been occupied with acquisition in Manitowoc. Therefore a small amount of time was focused towards the Green tier program. Briess addressed this issue by hiring me, Seng Yang as the Environmental Health & Safety- Specialist in 2014 to address and report annual findings for our EMS program. We have not established our targets yet however, we have addressed our objectives. We recently installed/ upgraded our equipment's to improve and reduce water, waste, and energy as much as possible. For next year, some of our high importance will be focused on incorporating Insta Grains and Manitowoc facility, establishing our targets, reduce NG consumption through possible heat recovery for Chilton Malt House and Waterloo Malt House and established benchmarks.

Irish Road Extract Plant

- **Objective:** Reduce water volume sent to high- strength waste through improved diversion. Install new metering equipment to reduce number of trucks sent with lower strength waste and divert low strength waste to WWTP
    - Turbidity Meter for our whirlpool
        - Saving high quality clear wort
            - Reducing waste
    - Inferred/ UV-light to detect dissolve sugars
    - Heat exchange
        - Reduce water usage
        - Decrease carbon emissions
        - Energy saving
- **Objective:** Utilize focus on energy to analyze motor and VF drives to determine most effective options
    - VF drives install for our gas
        - Control the air flow
    - Servo drive installed
        - Controls the boiler
- **Other initiatives:**
    - Changing chemical vendors
        - Reduce our chemicals products on site
        - Using less chemicals

Chilton Malt House

- **Objective:** Determine if VF drives opportunities exist
    - VF drive installed in:
        - Germination fan
        - Two roasters
- **Objective:** Increase rail transport where feasible to improve carbon footprint
    - Switch trucks to rail service
        - To Chico California
        - To Sierra Nevada

Waterloo Malt House

- **Objective:** Improve sieve operation to reduce solid content to WWTP
    - Grain slurry drain installed
- **Objective:** Increase rail transport where feasible to improve carbon footprint
    - Three rail carts to Canadian National
- **Other initiatives:**
    - Recycle grain sludge and spent grains to farmers
    - VF drives installed on kiln fans
        - Reduce energy
    - Boilers use steam to recirculate water back and forth

    - Installed a “Scale” flow meter to calculate the amount of product loaded on a truck/cart
        - Decrease truck traffic by 8 miles and saves time
            - 4 miles to the weight station and back.
    - Energy efficient light bulbs

Waterloo WWTP

- **<u>Objective</u>:** Utilize focus on energy to analyze motor and VF drives to determine most effective options
    - VF drives installed
    - Upgraded motor pumps
    - Electrical upgrades

<u>High importance for next year</u>

- Incorporating to our EMS
    - Insta Grains facility
    - Manitowoc facility
- Reduce NG consumption through possible heat recovery
    - Chilton/ Waterloo Malt House
- Establish targets

Distributions Center/ Extract

2012- DIST CENTER/ EXTRACT					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	157112.1	88,765.73		461641.0	30,544.54
FEBRUARY	166962.8	86,165.87		505975.0	31,877.64
MARCH	176492.5	89,993.76		518389.0	33,570.91
APRIL	151303.0	68,372.48		471262.0	30,655.14
MAY	156151.9	71,084.87		441448.0	30,214.01
JUNE	143837.4	72,266.28		523749.0	38,126.78
JULY	129751.5	63,846.35		514545.0	39,088.37
AUGUST	134047.7	69,054.85		448716.0	35,274.41
SEPTEMBER	136320.1	67,482.36		496545.0	38,450.99
OCTOBER	151249.1	75,228.30		427567.0	31,151.49
NOVEMBER	115936.2	64,246.58		417650.0	29,332.59
DECEMBER	131326.6	75,862.77		375746.0	27,962.31
TOTAL	**1750490.9**	**$892,370.20**		**5603233**	**$396,249.18**

2013- DIST CENTER/ EXTRACT					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	189399.6	100,675.34		455234.0	31,719.73
FEBRUARY	160449.5	85,465.69		499458.0	34,164.84
MARCH	169829.0	93,672.93		418750.0	29,883.32
APRIL	156595.7	77,573.91		457842.0	31,912.91
MAY	150455.9	77,353.88		526598.0	35,775.56
JUNE	156458.5	80,256.99		497756.0	37,476.47
JULY	123346.0	60,446.04		479783.0	37,627.66
AUGUST	118852.1	58,537.54		376041.0	30,389.76
SEPTEMBER	155816.9	74,069.26		529161.0	40,444.70
OCTOBER	162400.1	76,783.17		482349.0	34,714.86
NOVEMBER	162423.4	78,562.48		502459.0	34,293.08
DECEMBER	194497.8	100,335.39		508951.0	34,988.87
TOTAL	**1900524.5**	**$963,732.62**		**5734382**	**$413,391.76**

- Fuel usage increased by 8.57%
    - Cost increased by 8%
- Electricity(kw) usage increased by 2.34%
    - Cost increased by 4.33%

Chilton Malt House

2012 CHILTON MALT HOUSE					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	55327.2	31,377.85		231520.0	16,272.87
FEBRUARY	52985.4	28,389.96		233280.0	16,275.71
MARCH	46488.7	25,995.15		231360.0	16,849.99
APRIL	43715.3	21,535.58		217120.0	15,463.03
MAY	43191.3	21,539.83		217440.0	16,138.86
JUNE	41256.1	21,530.24		280480.0	21,096.43
JULY	41962.3	20,847.56		290560.0	22,296.19
AUGUST	45278.9	22,472.98		295520.0	22,211.12
SEPTEMBER	45610.1	21,632.73		250240.0	19,819.75
OCTOBER	50969.3	29,812.33		211520.0	15,939.29
NOVEMBER	58569.0	29,430.33		238080.0	16,637.18
DECEMBER	62372.2	32,268.78		219520.0	15,463.48
TOTAL	**587725.8**	**$306,833.32**		**2916640**	**$214,463.90**

2013 CHILTON MALT HOUSE					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	68082.1	35,156.06		212000.0	15,130.07
FEBRUARY	61461.8	31,584.16		240640.0	16,661.91
MARCH	65425.9	35,591.19		207840.0	14,957.23
APRIL	58175.0	29,231.05		220000.0	15,623.56
MAY	52135.4	27,213.87		243200.0	17,251.16
JUNE	50547.9	26,411.71		244640.0	19,415.13
JULY	50215.0	24,598.81		284320.0	22,195.10
AUGUST	49940.1	23,949.87		279360.0	21,871.23
SEPTEMBER	50729.3	24,303.77		268640.0	21,475.98
OCTOBER	57618.0	27,429.88		224000.0	17,258.41
NOVEMBER	60428.2	28,936.65		231200.0	16,314.87
DECEMBER	66736.1	33,784.73		230720.0	16,166.86
TOTAL	**691494.8**	**$348,191.75**		**2886560**	**$214,321.51**

- Fuel usage increased by 17.66%
    - Cost increased by 13.48%
- Electricity(kw) usage decreased by 1.04%
    - Cost decreased by 0.07%

Waterloo Malt House

2012- WATERLOO MALT HOUSE					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	101955.0	58,519.61		339320.0	32,191.36
FEBRUARY	101822.0	55,254.58		350600.0	33,129.60
MARCH	96941.0	52,167.52		349260.0	32,237.88
APRIL	90184.0	43,866.36		314240.0	31,686.40
MAY	79348.0	40,764.31		317600.0	30,130.75
JUNE	73843.0	38,718.65		295380.0	30,138.02
JULY	76714.0	39,393.66		322440.0	34,916.39
AUGUST	86636.0	43,793.33		349440.0	30,858.87
SEPTEMBER	75301.0	37,866.92		302920.0	28,385.03
OCTOBER	83095.0	43,355.41		306580.0	28,902.64
NOVEMBER	87468.0	45,199.53		307540.0	31,409.11
DECEMBER	92992.0	50,673.34		291680.0	29,142.88
TOTAL	**1046299.0**	**$549,573.22**		**3847000**	**$373,128.93**

2013- WATERLOO MALT HOUSE					
MONTH	FUEL THERMS	FUEL $		ELECTRICITY KW	ELECTRICITY $
JANUARY	95039.0	51,022.90		340080.0	33,400.64
FEBRUARY	81790.0	45,014.84		317160.0	29,166.54
MARCH	96306.0	53,440.55		338600.0	30,713.09
APRIL	79224.0	40,546.68		315540.0	31,170.33
MAY	77538.0	41,225.32		346880.0	30,644.66
JUNE	76570.0	40,572.21		321140.0	32,663.98
JULY	73919.0	37,238.72		362860.0	39,629.83
AUGUST	80552.0	39,344.58		329920.0	30,466.18
SEPTEMBER	74574.0	36,752.02		298020.0	30,655.16
OCTOBER	85846.0	41,823.36		339520.0	30,483.35
NOVEMBER	103124.0	49,340.20		322200.0	32,380.15
DECEMBER	121725.0	62,151.70		364540.0	34,633.65
TOTAL	**1046207.0**	**$538,473.08**		**3996460**	**$386,007.56**

- Fuel usage decreased by 0.01%
    - Cost decreased by 2.06%
- Electricity(kw) usage increased by 3.89%
    - Cost increased by3.45%

Distributions Center/ Extract

2012 Water Usage		
Irish Road	Usage (gal)	Cost
1st quarter	23,826,986	$72,319.25
2nd quarter	26,464,801	$72,762.97
3rd quarter	26,836,015	$78,298.03
4th quarter	23,694,854	$68,216.13
Total usage	100,822,656	$291,596.38

2013 Water Usage		
Irish Road	Usage (gal)	Cost
1st quarter	28,755,477	$79,912.31
2nd quarter	29,871,258	$79,816.72
3rd quarter	26,620,542	$77,758.21
4th quarter	30,286,405	$82,681.79
Total usage	115,533,682	$320,169.03

- Water usage increased by 14.6%
    - Cost increased by 9.8%

Chilton Malt House

2012 CMC	Usage (gal)	Cost
1st quarter	9,133,259	$37,075.10
2nd quarter	14,065,647	$50,268.21
3rd quarter	31,237,608	$85,453.50
4th quarter	9,695,699	$48,442.95
Total usage	64,132,213	$221,239.76

2013 CMC	Usage (gal)	Cost
1st quarter	8,485,313	$41,177.72
2nd quarter	13,749,868	$63,227.76
3rd quarter	22,484,800	$71,616.54
4th quarter	10,145,479	$46,668.54
Total usage	54,865,460	$222,690.56

- Water usage decreased by 16.9%
    - Cost increased by 0.65%