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STUDY SESSION MRF Project Description

Finance Committee Meeting 2/14/2019

Capital Improvement Plan

MRF Upgrade Description and Financial Analysis

MRF Phase I Equipment Upgrade Project

Total Capital \$7,329,944, Annual Benefit \$1,251,502 (see detail financial sheets)

In the wake of the commodity market challenges and the need to improve fiber commodity quality to ensure market outlets, SBWMA and SBR staff have analyzed many options to improve material quality. Automation of MRF sorting has emerged as a key strategy towards this goal. Phase I Equipment Upgrade includes three projects with financial, market, and operational benefits that assist the agency for the next decade. Phase I projects are designed to be installed prior to Phase II so that the improvements in commodity quality can be assessed in the final design of Phase II Equipment Upgrades. The below projects compose Phase I.

1) Enhanced Glass Cleanup System (see detail financial sheets)

Capital Expense \$684,158, Annual Benefit \$67,883

Project Description - The MRF glass commodity is created by breaking all the glass fed into the sorting system and then sifting fine material/glass out of the stream of recyclables. Currently this glass mix is contaminated with shredded paper, batteries, and small metals and plastic contaminates. The glass clean-up system will remove contaminates through a combination of magnets, screening and air. A key aspect of the project is to remove batteries and to reduce exposure to fires caused by lithium ion batteries.

Project Benefits - Benefits of the Enhanced Glass Cleanup System include:

- Reduced Fire Risk: two types of magnets will remove and isolate batteries from the flow of recyclables and thereby reduce the risk of LI battery fires.
- Improved Commodity Value: Removing contamination has a direct commodity value benefit of \$4/ton.
- Additional Commodity Recovery: in addition to batteries, all metals will be removed and sold at a higher value (currently metals [-1% of the glass stream] is lost in mix glass).
- Revenue Enhancement: By reducing "prohibitive materials" from the glass, additional California redemption value (CRV) revenue can be claimed (~\$25K/year).
- Process Improvement: The increasing amount of shredded paper that businesses and residents are including in recycling is showing up in the glass stream and plugging the glass sorting system causing daily plant stoppages.

2) Robotic Sorting/Fiber QC System

Capital Expense \$1,635,000, Annual Benefit \$204,637(see detail financial sheets)

Project Description - BHS manufactures a robotic sorting system (Max-AI AQC) that utilize advanced recognition and AI technology to identify and sort a wide variety of materials. Applying this robotic system to the MRF residue will result in a reduction in sort labor expense and the capture of more recyclable materials

that are currently “lost” to residue/disposal. Additionally, this recognition system will be installed at the end of all fiber sort lines to identify, record, and report the fiber composition and quality so that the Phase II optical sort system will meet the fiber commodity quality standard for high grade paper.

Project Benefits - the robotic sort and quality control system benefits include:

- Reduced Sort Labor Expense: The Max-AI AQC would eliminate the need for three sort labors.
- Increase capture of recyclables: By applying robotic sorting to the residue line, additional recyclables will be recovered from disposal and sold to increase commodity revenue.
- Valuable Data Collection: Max-AI AQC & Max-AI Vision Fiber QC will provide real-time reporting of fiber that will be to communicate fiber quality to buyers.
- Phase II System Design: Continuous data-logging will provide essential information needed to precisely design the Phase II optical sort system.

3) Third-Sort Optical Line

Capital Expense \$4,548,094, Annual Benefit \$978,982 (see detail financial sheets)

Project Description: Small fiber and beverage containers will be separated from the existing commercial and residential lines and separately sorted using two high-speed optical sorting equipment. The new optical sorting units will remove small cardboard and containers that are currently contaminating mixed paper commodity. (Like the 4-optical sorters currently installed at the MRF to separate plastic containers, these new high-speed optical sorters will be applied to clean contamination out of mixed paper.

Project Benefits: Third-sort optical line benefits include:

- Improved Commodity Marketability: Current fiber markets demand pure commodity to achieve higher revenues. Optical sorting is the only way to cost effectively remove nearly all contamination materials from the mix paper stream and improve fiber quality to ensure marketability.
- Improved Recovery of Recyclables: A large quantity of cardboard and containers and are currently “lost” to mixed paper (inefficient sorting results in crossover/mixing of cardboard and containers into mixed paper). Optical sorting equipment will correctly sort and capture containers and cardboard for sale into higher value markets (currently, mixed paper is contaminated with 30% cardboard and 3% containers).
- Increased Processing Capacity/Reduced Overtime: The MRF was designed to sort all of the SBWMA recyclables (288 tons/day) in one eight-hour shift. Due to stricter fiber quality standards, SBR has been forced to slow the MRF sort system to achieve cleaner fiber (the MRF is currently operating +10-hours/day). Optical sorting systems will speed up the sort operations and produce cleaner fiber allowing SBR to return to 8-hours sort shift.

MRF Phase II Equipment Upgrade Project *(Implemented after Phase I)*

Total Capital \$8,250,000, Annual Benefit \$1,658,576 (see detail financial sheets)

Project Description: Since China's Import Ban of mixed paper in October 2017, the price for this commodity has crashed from +\$100 to less than \$10 per ton over the year of 2018. While other countries have stepped-in to buy some of the mixed paper, China departure from this grade has resulted in a large world-wide surplus of mixed paper that will continue to depress market prices far into the future. SBWMA has working with Potential Industries to identify new market opportunities for mixed paper – a commodity grade that makes up 1/3rd of the MRF commodity tonnage.

In 2018, at its MRF in Wilmington Ca, Potential installed high-speed optical fiber sorting equipment that can make a clean high-grade paper that sells at a \$75 per ton premium over mixed paper (see **attached fiber sale price assurance letter from SBR/Potential Industries**). The specification for high-grade paper requires that nearly all contamination be sorts from the mixed paper- a feat that can only be accomplished with state-of-the-art sorting equipment. Phase II MRF Equipment Upgrade project includes full-optical sorting systems for all mixed paper lines to meet this new paper quality standard. The financial benefits of the project accrue from: 1) the upgrading of mixed paper to high-grade paper, 2) the recovery of commodities that are currently "lost" in mixed paper and 3) from sort labor savings.

Project Benefits: MRF Phase II Equipment Upgrade – Full Optical Fiber Sorting:

- **Improved Commodity Marketability:** Current fiber markets demand pure commodity to achieve higher revenues. Optical sorting is the only way to cost effectively remove nearly all contamination from the mix paper. By achieving a high-grade paper standard of <3% contamination, mixed paper can be sold at a \$75 per ton premium (see **attached letter from Dan Domonoske SBR**)
- **Improved Recovery of Recyclables:** A large quantity of cardboard and containers are currently "lost" to mixed paper (inefficient sorting results in crossover/mixing of containers and cardboard into mixed paper commodity). Optical sorting will correctly sort and capture containers and cardboard for sale into higher value markets (mixed paper contains 30% cardboard and 3% containers which are not considered contaminates). The optical equipment can perform work equal to 33-sort laborers and is the only way to capture the cardboard and containers now contaminating the mixed paper bales.
- **Increased Processing Capacity/Reduced Overtime:** The MRF was designed to sort all of the SBWMA's recyclables (288 tons/day) in one eight-hour shift. Due to stricter limits on fiber quality, SBR has been forced to slow the MRF sort system to achieve cleaner fiber (the MRF is currently running +10-hours/day). Optical sorting systems will speed up the sort operations and produce cleaner fiber allowing SBR to return to 8-hours sort shift.
- **Reduced Sort Labor Expense:** there are currently 12-sorters dedicated to sorting mixed paper. Replacing 8 of these sorters with high speed optical sort equipment will save roughly \$800k per year. Additionally, SBWMA and SBR have split \$30K/month in "addition sort labor" cost required to create marketable fiber commodity. Optical sorting will eliminate this additional sort labor expense.



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Phase I Project

MRF Phase I Equipment Upgrade Project

Project Summary

Capital Expense

Enhanced Glass Cleanup System	\$	684,158	
Max-AI Robotic Recovery	\$	1,635,000	
Third-Sort Optical	\$	4,548,094	
Package Discount	\$	(203,667)	
Subtotal	\$	6,663,585	
Project Contingency	\$	666,359	10.0%
Total Capital	\$	7,329,944	\$ 7,329,944

	<i>a</i>	<i>b</i>	<i>c</i>
Annual Financial Benefit		Interest	Net Benefit
1. Enhanced Glass Cleanup System	\$ 67,883	\$ (28,570)	\$ 39,313
2. Max-AI Robotic Recovery	\$ 204,637	\$ (68,276)	\$ 136,361
3. Third-Sort Optical	\$ 978,982	\$ (189,925)	\$ 789,056
Package Discount			\$ -
Subtotal			
Total Benefit	\$ 1,251,502	\$ (286,772)	\$ 964,730

Interest Expense is 10 Year Average

Payback (Years)	5.86	7.60
ROI	17.1%	13.2%
Interest Rate on Bonds	4.5%	

Includes revenue share with SBR

Excludes depreciation

MRF Phase I Equipment Upgrade Project

Enhanced Glass Cleanup System

Equipment Benefits

- Recovers 50%-75% more shredded paper
- Removes Lithium-Ion and other hazardous batteries
- Recovers Ferrous Metals

Operating Expense Savings

MRF 3 Mix Glass Quality Improvement Savings

MRF 3 Mix Glass Annual Tons	14,424		
Estimated Glass Charge Savings	\$ 4.00		
Subtotal Scrap Glass Savings	\$ 57,696		
CRV Refund	\$ 130.00		
Quality Incentive Payment	\$ 10.00		
Subtotal Glass	\$ 140.00		
Additional Glass Recovery for CRV (Tons)	180.30	1.25%	
Subtotal CRV/QIP Revenue	\$ 25,242		
Scrap/Batteries in Mix Glass	144.24	1.0%	
Recovery of Scrap Metal/Batteries	108.18	75.0%	
Additional Scrap Revenue	\$ 7,573		\$ 70.00
Sub total Savings	\$ 90,511		
Revenue Share	\$ 22,628		
Net Savings	\$ 67,883		

Capital Expense

Enhanced Glass Cleanup System

Purchase and Installation Cost	\$ 684,158		
Total	\$ 684,158		
Payback (Years)	10.08		
ROI	9.9%		

Notes:

No scrap value for glass

MRF Phase I Equipment Upgrade Project

MAX-AI (Robotic Recovery)

Labor Savings

# VRS Sorter	3
Labor Cost / Sorter (10 Yr Avg)	\$ 68,212
Total Annual Savings (10 Yr Avg)	\$ 204,637

Capital Expense

Max-AI AQC for Residue	\$ 995,000
Max-AI Vision Fiber QC & Scada	\$ 640,000
Total Cost	\$ 1,635,000
Depreciation	\$ 163,500

Payback (Years)	7.99
ROI	12.5%

MRF Phase I Equipment Upgrade Project

Third Sort Optical

Annual Inbound Recyclables (2018)	77,387
Annual MRF Residue (Tons) (2018)	12,732
Annual Residue Percentage (2018)	16.45%
Estimated Annual Shipped Mixed Paper (2018)	27,077

Description of High Value Fiber Recovery

Cardboard Recovered	90%	1,411.72
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Description of High Value CRV Container Recovery

PET Containers Recovered	95%	349.64
Aluminum Containers Recovered	95%	135.90

Average Scrap Value (2018)

	<u>Avg Price</u>	<u>Revenue</u>
Cardboard	\$ 99.69	\$ 140,735
PET	\$ 179.51	\$ 62,763
Aluminum	\$ 881.75	\$ 119,828
<i>Subtotal</i>		\$ 323,326

Average CRV Value (2018)

	<u>CRV Value</u>	<u>Revenue</u>
PET	\$ 1,560.72	\$ 545,685
Aluminum	\$ 3,210.49	\$ 436,298
<i>Subtotal</i>		\$ 981,983

Total Additional Annual Revenue \$ 1,305,309

Revenue Share \$ 326,327 25%

Total Net Revenue \$ 978,982

Debris Roll Screen Retrofit

Bypass System Upgrade **\$ 4,548,094**

Payback (Years) 4.65

ROI 21.5%

MRF Phase I Equipment Upgrade Project

MRF Composition Study Data

Post-Processed Baled Mix Paper			Post-Process MRF Residual			Combined	
Sample	3,850.70		Sample	2,470.20		6,320.90	
Material	Lbs.	%	Material	Lbs.	%		
Mixed Paper	2,199.20	57.11%	Mixed Paper	344.90	13.96%	2,544.10	40.25%
OCC	1,221.40	31.72%	OCC	250.50	10.14%	1,471.90	23.29%
Brown	42.60	1.11%	Brown	-	0.00%	42.60	0.67%
Wax OCC	25.00	0.65%	Wax OCC	-	0.00%	25.00	0.40%
Bi-Metal	5.20	0.14%	Bi-Metal	46.80	1.89%	52.00	0.82%
Film Plastic	46.80	1.22%	Film Plastic	-	0.00%	46.80	0.74%
Aluminum	17.00	0.44%	Aluminum	11.50	0.47%	28.50	0.45%
HDPE Natural	4.20	0.11%	HDPE Natural	33.90	1.37%	38.10	0.60%
HDPE Color	1.50	0.04%	HDPE Color	68.70	2.78%	70.20	1.11%
PET	32.00	0.83%	PET	45.60	1.85%	77.60	1.23%
Tin	7.00	0.18%	Tin	30.80	1.25%	37.80	0.60%
#3-#7	49.80	1.29%	#3-#7	-	0.00%	49.80	0.79%
Glass	-	0.00%	Glass	69.60	2.82%	69.60	1.10%
Trash	199.00	5.17%	Trash	1,567.90	63.47%	1,766.90	27.95%
Total	3,850.70	100%		2,470.20	100%		

* Sample Period: 06/25/2018 -10/12/2018

* Sample Period: 08.20.2018 - 09.14.2018



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Phase II Project

MRF Phase II Equipment Upgrade Project

Project Summary

Capital Expense		
CAPITAL	\$	7,500,000
Contingency	\$	750,000 10%
TOTAL CAPITAL	\$	8,250,000

	<i>a</i>	<i>b</i>	<i>c</i>
	Annual Financial Benefit	Interest	Net Financial Benefit
Net Incremental Revenue	\$ 1,494,260		\$ 1,494,260
Net Labor Savings	\$ 487,084		\$ 487,084
Interest (10 Yr Avg.)		\$ (322,767)	\$ (322,767)
TOTAL SAVINGS	\$ 1,981,344	\$ (322,767)	\$ 1,658,576

Payback	4.2	5.0
ROI	24.0%	20.1%
Interest Rate on Debt	4.5%	

*includes Revenue Share
excludes depreciation*

MRF Phase II Equipment Upgrade Project

Material Composition Study and Material Recovery

2018 Actual MP Average Composition Test Results			Projected Composition 4" Minus Presented to New Sort Equipment				Material Conveyed to Fiber Post-Sort for Further Optical Sorting							Recovered & Sold		
Material	%	Tons	Material Type	2018 Actual Composition Test Results 4" Minus	Tons	% of Loss	Material	¹ Tons	² Rate of Recovery	³ Tons Recovered Optically	⁴ % of Loss	Tons to OCC	⁵ Manual Recovery	High Grade Paper	Material	Tons Recovered from MP
Paper	56.45%	15,285	Paper	46.0%	7,031.06	90%	Paper	13,756	0.0%	-	10.0%	1,376		12,381		
OCC	38.35%	10,383	OCC	15.4%	1,599.02	90%	OCC	7,906	90.0%	7,115	10.0%		10.0%	79	OCC	8,491
Glass	0.09%	25	Glass	1.8%	0.46		Glass	25						25	Glass	-
Metal	0.17%	47	Metal	0.8%	0.37	95%	Metal	44	95.0%	42	5.0%			2	Metal	42
Plastic (Film)	1.32%	357	Plastic (Film)		-		Plastic (Film)	357	95.0%	339	5.0%			18	Plastic (Film)	339
PET	0.41%	112	PET	3.1%	3.46	95%	PET	103	95.0%	98	5.0%			5	PET	98
Aluminum	0.13%	34	Aluminum	0.7%	0.24	95%	Aluminum	32	95.0%	30	5.0%			2	Aluminum	30
HDPE Natural	0.05%	14	HDPE Natural	1.2%	0.16	95%	HDPE Natural	13	95.0%	12	5.0%			1	HDPE Natural	12
HDPE Color	0.03%	8	HDPE Color	1.6%	0.13	95%	HDPE Color	8	95.0%	7	5.0%			0	HDPE Color	7
Tin	0.11%	29	Tin	1.8%	0.53	95%	Tin	27	95.0%	26	5.0%			1	Tin	26
Residue	2.90%	784	Residue	27.6%	216.36		Residue	568	90.0%	511	10.0%			57	Residue	1,561
2018 Shipped N		100.00%	27,078	100.0%	8,851.80		22,838							12,571		
Prohibitive	5.21%													0.88%		
Outthrow	38.35%													0.63%		

Foot Notes

- ¹ Material conveyed to fiber post-sort QC lines for further optical sorting
- ² Optical sorting equipment rate of recovery by material type as warranted by OEM
- ³ Amount of material recovered by optical sorting equipment
- ⁴ Percentage of material not-recovered in optical sort equipment and conveyed to OCC bunker or to MP bunker
- ⁵ OCC recovered manually at fiber post-sort QC lines

MRF Phase II Equipment Upgrade Project

MRF SORT LABOR WORKSHEET

CURRENT & PROJECTED MRF SORT LABOR		PROJECTED SORT LABOR AFTER EQUIPMENT INSTALLATION	
Rate/HR \$	17.00	Rate/HR \$	17.00
County Markup	45%	County Markup	45%
Hourly Rate \$	24.65	Hourly Rate \$	24.65
OT Rate/HR \$	25.50	OT Rate/HR \$	25.50
County Markup	45%	County Markup	45%
OT Rate \$	36.98	OT Rate \$	36.98
		0	0
Reg Hrs.	2080	Reg Hrs.	2080
OT Hrs.	260	OT Hrs.	260
Reg Wages \$	51,272	Reg Wages \$	51,272
OT Wages \$	9,614	OT Wages \$	9,614
Annual Wages \$	60,886	Annual Wages \$	60,886
Average Sorters	26	Sorters	18
Total Sort Labor \$	1,583,023	Total Sort Labor \$	1,095,939
		Annual Incremental Labor Savings \$	487,084
		Monthly Incremental Savings \$	40,590

MRF Phase II Equipment Upgrade Project

MATERIALS RECOVERY FACILITY REVENUE COMPARISON

CURRENT MIX PAPER COMMODITY REVENUE			
	HGP (Plus 4")	Avg Price /Ton	Revenue
HGP	22,838	\$ 10	\$ 228,382
OCC			
Glass			
Metal			
Plastic (Film)			
PET			
Aluminum			
HDPE Natural			
HDPE Color			
Tin			
Residue			
Total	22,838	\$ 10	\$ 228,382

PROJECTED WITH FIBER POST SORT LINES		
Material Recovery	Projected Material Value	Projected Revenue
12,571	\$ 85	\$ 1,068,510
8,491	\$ 99	\$ 840,596
-	\$ -	\$ -
42	\$ 70	\$ 2,898
-	\$ -	\$ -
98	\$ 1,740	\$ 170,096
30	\$ 4,092	\$ 124,686
12	\$ 625	\$ 7,618
7	\$ 390	\$ 2,841
26	\$ 134	\$ 3,483
1,561	\$ -	\$ -
22,838	\$ 7,235	\$ 2,220,728

Incremental Revenue	\$ 1,992,346
Revenue Share	\$ (498,087)
Net Incremental Revenue	\$ 1,494,260



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Attachment A & Attachment B

February 12, 2019

SBWMA, RethinkWaste
Facility Operations Contracts Manager
Mr. Hilary Gans
610 Elm Street, Suite #202
San Carlos, CA 94070

Re: Fiber Market Explanation and Price Comparison

Dear Mr. Gans,

Recovered paper and cardboard, also known as fiber, represents approximately 50% of the commingled materials sorted in the MRF. SBR has some of the best fiber export marketing capabilities in the recycling industry, which remains dependent on export due to lack of domestic demand. As you know, end user mills throughout SE Asia have tightened up their quality requirements, and MRFs throughout CA are responding by making higher quality products.

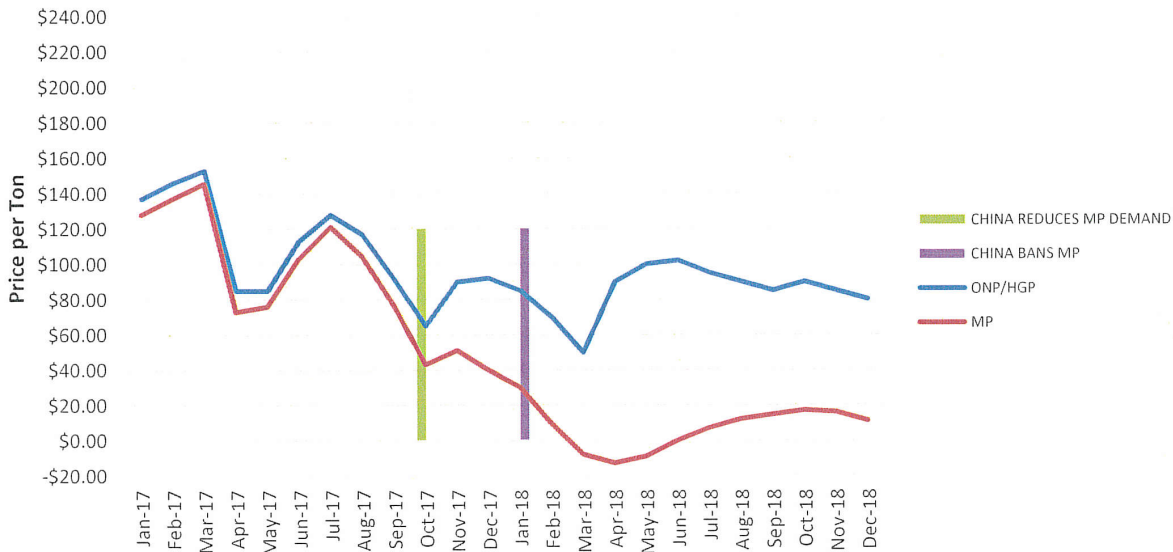
In 2018 China, then the largest end user of mixed paper in the world, banned the import of mixed paper. Although there are a few other markets in SE Asia for mixed paper, the price is very low. To make matters worse, there is trend in SE Asia for other countries to also ban mixed paper. By reducing the quantity of mixed paper being generated SBWMA has the opportunity to reduce their risk of having a sorted product without a market, either domestic or export. In addition, by creating a higher quality paper it can be sold at better pricing than Mixed Paper.

Graph #1 below shows the monthly price for High Grade Paper (formerly known as Old News Paper) compared to Mixed Paper. In 2017 those prices were quite close to each other. However, in Q4 2017 when it became clear that China would indeed ban Mixed Paper the gap between High Grade Paper and Mix Paper grew. The effective date of the ban was based on cargo arrival in China, as such the price gap accelerated in November and December 2017.

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Graph #1

2017-2018 Price Comparison Old News Paper/High Grade Paper (ONP/HGP) v Mix Paper (MP)



In 2018 several haulers and MRFs were forced to send Mixed Paper to landfills. This was done either by stockpiling bales in hopes of a market resurgence only to find there was none, or no longer sorting it from the commingled stream and simply letting it go to residue without being sorted and baled in the MRF. In either case the outcome had negative impacts on diversion levels and public perception of recycling.

Today there is a unique opportunity available to SBWMA which is created by customer demand, technology developments for MRF processing equipment, and bond refinancing. These events provide SBWMA with a decision to make regarding the MRF: shall we invest in the future of our MRF?

In our professional opinion, by investing in the proposed MRF equipment upgrades there will be two changes to the fiber commodities: (1) less Mixed Paper being produced, and (2) more sorted fiber products being sold at higher pricing. These changes will increase the monthly revenues and also increase the number of end users that are interested in our fiber products.

The initial economic benefit is producing a higher quality paper grade from the commingled materials which are collected in single family residential collection routes. That paper is mechanically screened on the residential sort line to create paper which is currently sold as Mixed Paper (a low value commodity). In addition to removing most of the cardboard, the proposed system will also remove contamination and

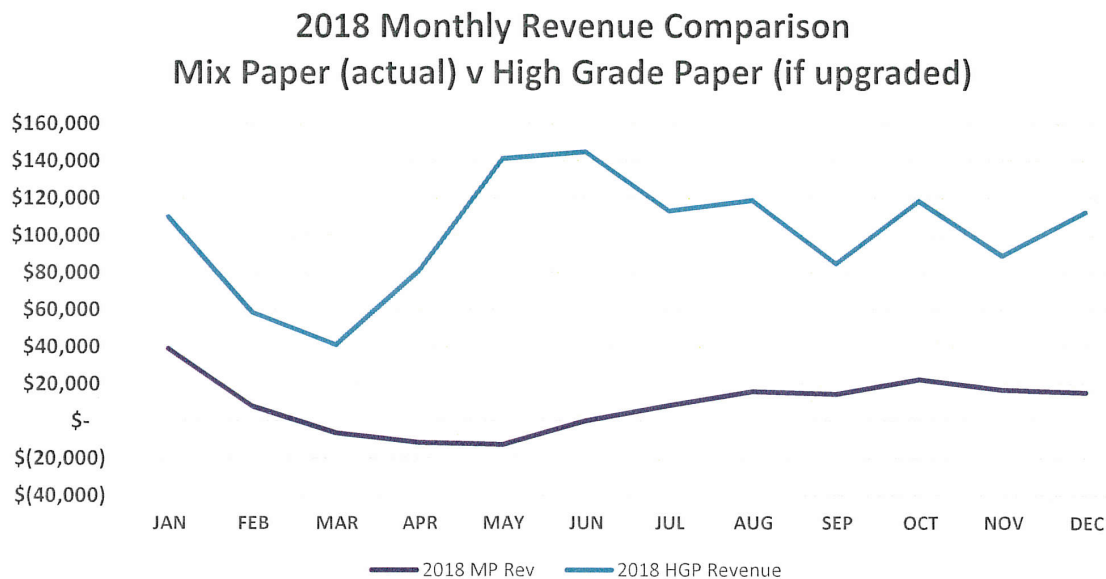
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Tel 650.802.8355 | Fax 650.412.2495 | SBRecycling.net

South Bay Recycling, LLC

containers from the Mixed Paper. As a result that paper will be higher quality and will be sold as High Grade Paper, at a premium price above Mixed Paper.

Graph #2 below shows the actual monthly revenue in 2018 for the paper which was sold as Mixed Paper (MP) compared to the monthly revenue for that same material if it was sold as High Grade Paper (HGP). The cumulative incremental economic benefit from selling those tons as HGP amounts to over \$1,100,000 in 2018, and that would have been achieved had the new equipment upgrade been installed and operational.

Graph #2

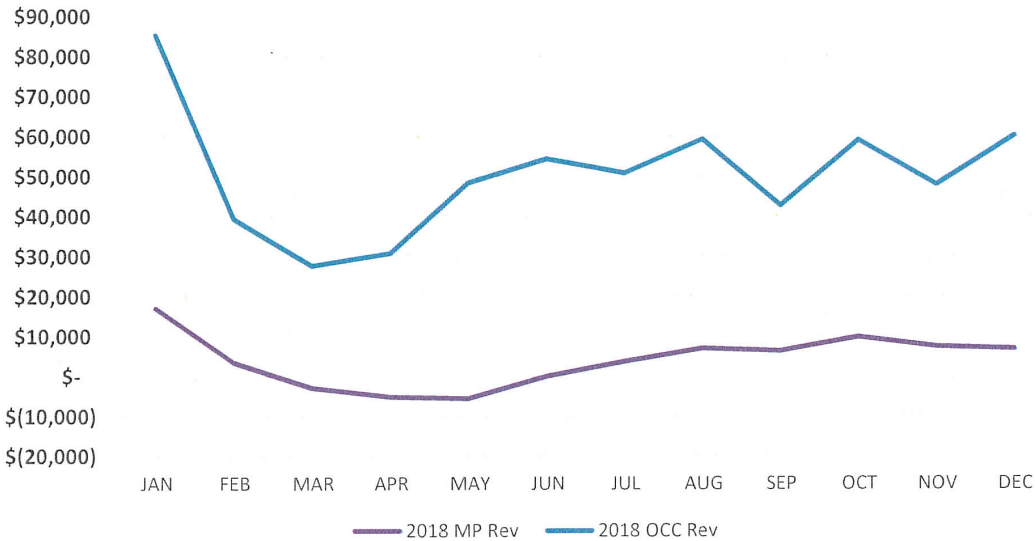


The other economic benefit from the proposed upgrade is increasing the amount of cardboard (aka Old Corrugated Containers, or OCC) being produced. Over the past 10 years there has been an increase in online shopping which results in households generating more cardboard, and those cardboard pieces are smaller in size and lighter in weight. As such a lot of that cardboard currently ends up in Mixed Paper. The proposed system will remove most of it from the Mixed Paper (a low value commodity) and recover it as OCC cardboard (a higher value commodity).

Graph #3 below shows the actual monthly revenue in 2018 for the paper which was sold as Mixed Paper compared to the monthly revenue for that same material if it was sold as Old Corrugated Containers (OCC). The cumulative incremental economic benefit from selling those tons as OCC amounts to over \$500,000 in 2018, and that would have been achieved had the new equipment upgrade been installed and operational.

Graph #3

2018 Monthly Revenue Comparison
 Mix Paper (actual) v. Cardboard (OCC (if upgrade))



In addition to the economic benefits listed above, there will be significantly less paper being sold as Mixed Paper. This is important because the uncertain future demand for Mixed Paper causes many in the industry to wonder how long it will remain a viable product.

SBWMA is working with two of the best partners in the industry, SBR (facility operations) and BHS (equipment supplier), and together the team can implement the proposed projects to create value that provides long term economic and environmental benefits to Member Agencies.

Future recycling commodity market pricing and quality requirements cannot be precisely defined. However, there is a consensus within the industry that the facilities which are sustainable will be those that are capable of doing two things: (1) producing grades that are in demand, and (2) producing qualities that are better than the prevailing industry average.

Best Regards,

Daniel J. Domonoske
 Vice President

CC: Dwight Herring, GM

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**Potential
Industries Inc**

720 East "E" Street
Wilmington, CA 90744
(310) 549-5901

February 13, 2019

SBWMA, RethinkWaste
Facility Operations Contracts Manager
Mr. Hilary Gans
610 Elm Street, Suite #202
San Carlos, CA 94070

Re: High Grade Paper (HGP) sorted from MRFs

Dear Mr. Gans,

As you know, Potential Industries, Inc. (PII) has been exporting recovered paper for over 40 years. In addition to our own MRF sorted paper, we also market sorted paper from over 20 MRFs throughout the USA.

Based on our many years' experience, and using our best professional judgment regarding paper sorted from single stream MRFs: (a) we have serious concerns about the long term viability of traditional mixed paper, and (b) we believe High Grade Paper will continue to not only be in demand, but also the price for it will be significantly higher than traditional mixed paper.

In 2018 the price of High Grade Paper was approximately \$75 per ton higher than traditional mixed paper, and in our opinion that premium is likely to continue. Although nobody in the industry can accurately predict future pricing, we strongly encourage MRFs to upgrade their mixed paper to High Grade Paper because this grade will continue be consumed by many paper mills.

Best Regards,

Daniel J. Domonoske
Executive Vice President