

City of Ann Arbor MRF Audit

Dear Ms. Gomes,

The following report is a maintenance and operations evaluation of the CP Equipment at the City of Ann Arbor Materials Recovery Facility. The information gathered in this report was collected by John Kemp (CP Field Technician), and Brian Pressley (CP Customer Service Assistant Manager). This information was gathered over a 2-day period.

During the 2 day evaluation, our team focused on the following key areas:

1. Maintenance of the Equipment (with a focus on the Main equipment primarily)

The report has been organized in the following manner:

- A. Master Equipment list for the Ann Arbor Facility
- B. Itemized breakdown of each individual piece of equipment
- C. Corresponding list of the individual parts evaluated for each piece of equipment
- D. Notes and recommendations for each piece of equipment

We would like to extend our appreciation for welcoming us into your facility and for all of the help and assistance offered to us during our visit. We hope that the information contained within this audit helps with the necessary improvements, resulting in improved equipment performance and material recovery. Please feel free to contact us at any time with any questions or concerns. We are here to assist and support you and your team.

Sincerely,

Brian Pressley Customer Service Assistant Manager CP Manufacturing

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THE FOLLOWING LIST REFLECTS THE EQUIPMENT PROVIDED FOR THE CITY OF ANN ARBOR. PLEASE USE THIS LIST FOR THE CORRESPONDING DOCUMENTS. MOTOR DESC

M-1 LOWER HORIZ CONV, 9' PITCH, 3" ROLLER CHAIN - EXISTING, EXTENDED 15 FT

- INCLINE CONV, 9" PITCH, 3" ROLLER CHAIN EXISTING, EXTENDED AT TAIL 10 FT (REINFORCED FOR D METERING DRUM, LH DRIVE (REMOTE CONTROL FROM TOUCH SCREEN) M-2
- M-3
- M-4A STEEL TRANSFER CONVEYOR FLAT SLIDER C/W 220 RUBBER CLEATED BELT
- M-4B STEEL TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BELT
- TRASH TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER CLEATED BEL1 M-5
- M-6 LARGE PLASTIC TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BEL1
- M-7 EXISTING OCC SCREEN, 2 SECTION RH DRIVES POSITION
- M-8 EXISTING LARGE OCC TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BELT
- M-9A EXISTING LARGE OCC SORT CONVEYOR, EXISTING SHORTEN 23 FT
- M-9B LARGE OCC TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER CLEATED BELT, 3"@72" M-10A
- OCC BUNKER CONVEYOR, 9" PITCH, 3" ROLLER CHAIN STEEL BELT, REVERSING M-11
- EXISTING MIXED (OCC UNDERS) CORRUGATED SIDE WALL BELT TRANSFER CONVEYOR EXISTING MIXED TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BELT
- M-12 M-13 SCALPING SCREEN PRE-SORT CONVEYOR
- SCALPING SCREEN, 3 SECTION LH DRIVES POSITION M-14
- M-15 SCALPING SCREEN POST-SORT/TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER CLEATED BEL
- M-16A SMALL OCC TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BELT
- M-16B TRASH TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BEL1
- TRASH TRANSFER CONVEYOR, FLAT SLIDER C/W 220 RUBBER FLAT BEL1 M-16C
- ONP NEWSCREEN (LARGE FIBER CUT), SINGLE DECK RH DRIVE (DISC SPACING 8") 110V LUBRICATIK M-17
- M-18 LARGE FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER FLAT BELT (NEWSCREEN OVERS) NOT USED M-20
- LARGE FIBER SORT CONVEYOR, FLAT SLIDER 220 CLEAT TOP RUBBER BELT
- M-21 CPSCREEN FEED CONVEYOR, FLAT SLIDER C/W 220 RUBBER CLEATED BELT M-22
- CPSCREEN (MID FIBER CUT), SINGLE DECK RH DRIVE (DISC SPACING 6") 110V LUBRICATION SYSTEM M-23
- MID FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER FLAT BELT (CPSCREEN OVERS) EXISTING MIDDLE/SMALL FIBER SORT CONVEYOR (TO BE REVERSED AND SHORTEN 12-6") M-24 NOT USED
- M-26 CONTAINERS TRANSFER CONVEYOR, SLIDER BED RUBBER BELT (UNDER CONVEYOR #24)
- M-27 CONTAINERS TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
- M-28 FIBER TRANSFER REVERSIBLE CONVEYOR, FLAT SLIDER C/W 220 RUBBER "V" GROVE CLEAT TOP BE
- M-29 GLASS BREAKER, 3 DECK RH DRIVE POSITION
- M-30 ADS FEED CONVEYOR, FLAT SLIDER C/W 220 RUBBER STAGGERED CLEATED BELT
- M-31A AIR DRUM SEPARATOR
- M-31B AIR DRUM SEPARATOR
- M-32 FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
- M-33 FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
- M-34 ADS FEED CONVEYOR, FLAT SLIDER C/W 220 RUBBER STAGGERED CLEATED BELT (CP SCREEN UND) M-35 AIR DRUM SEPARATOR
- M-36 FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT - 3" CLEATS
- M-37 FIBER TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
- M-38 EXISTING TRASH BUNKER CONVEYOR
- M-39 EXISTING SMALL OCC BUNKER CONVEYOR
- EXISTING OMP BUNKER CONVEYOR M-40
- M-41 OFFICE PAPER BUNKER CONVEYOR-EXISTING
- M-42 EXISTING ONP PAPER BUNKER CONVEYOR
- M-43 ONP PAPER BUNKER CONVEYOR-EXISTING
- M-51 PET QC CONVEYOR, SLIDER BED RUBBER CLEATED BELT
- M-52 PET SILO BLOWER
- M-53 PASS FRACTION TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
- CONTAINERS SORT CONVEYOR, FLAT SLIDER 220 RUBBER BELT EXISTING ALUMINUM EDDY CURRENT SEPARATOR (RH DRIVE). TO BE RELOCATED M-54
- M-55

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M-56	ALUMINUM QC CONVEYOR, SLIDER BED RUBBER BELT
M-57	ALUMINUM SILO BLOWER
M-58	EDDY CURRENT PASS FRACTION QC CONVEYOR, SLIDER BED RUBBER BELT LH DRIVE
M-59	TRASH TRANSFER CONVEYOR, FLAT SLIDER 220 RUBBER CLEATED BELT
	NOT USED
M-61	GLASS TRANSFER CONVEYOR (GLASS BREAKER UNDERS), TROUGHED ROLLER -2 PLY, RUBBER 220 [
M-62	GLASS TRANSFER CONVEYOR, FLAT ROLLER -4 PLY 150, CORRUGATED CLEATED CROSS RIGID BELT
M-63A	GLASS TRANSFER CONVEYOR, FLAT ROLLER -4 PLY 150, CORRUGATED CLEATED CROSS RIGID BELT
M-63B	GLASS TRANSFER CONVEYOR, TROUGHED ROLLER -2 PLY, RUBBER 220 BELT
_	GLASS CLEAN-UP SYSTEM-RH (SEE ITEM 464B FOR DUCTING INSTALLATION)
M-65A	GLASS TRANSFER CONVEYOR, TROUGHED ROLLER -2 PLY, RUBBER 220 BELT
M-65B	GLASS TRANSFER CONVEYOR, TROUGHED ROLLER -2 PLY, RUBBER 220 BELT
M-65C	GLASS TRANSFER CONVEYOR, TROUGHED ROLLER -2 PLY, RUBBER 220 BELT
M-66	EXISTING SURGE HOPPER VIBRATORY FEEDER
M-67	EXISTING GLASS CRUSHER INCLINE FEED CONVEYOR
M-68A	EXISTING "ANDELA" GLASS CRUSHER 1ST STAGE
M-68B	EXISTING "ANDELA" GLASS CRUSHER 2ND STAGE
M-69	EXISTING "ANDELA" GLASS TROMMEL INCLINE FEED CONVEYOR
M-70	EXISTING "ANDELA" GLASS TROMMEL
M-71	EXISTING SILOS AND BUNKERS UPLOAD CONVEYOR-REVERCED AND EXTENDED 19'-8"
M-72	EXISTING BALER FEED CONVEYOR-RELOCATED AND SHORTENED
M-73	EXISTING 2 RAMS BALER R.H. "GORILLA"
M-74A	EXISTING SILO WITH HOIST - ALL HOISTS TO BE CONTROLLED BY EXISTING BALER PANEL PER CHAN
M-74B	EXISTING SILO WITH HOIST
M-74C	EXISTING SILO WITH HOIST
M-74D	EXISTING SILO WITH HOIST
M-74E	EXISTING SILO WITH HOIST
M-74F	EXISTING SILO WITH HOIST
M-74G	EXISTING SILO WITH HOIST

- M-745 EXISTING SILO WITH HOIST M-74H EXISTING SILO WITH HOIST M-74J-1 EXISTING SILO WITH HOIST

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Item #	M 1		Motor #	M1	
Description:	Low	ver Horizontal Conve	eyor		
Component		Good Condition	Nee	ds Repair	N/A
Head Pulley		\boxtimes			
Tail Pulley		\boxtimes			
Return Roller					\square
Support Roller					\square
Trough Roller					\square
Lacing					\square
Tracking		\boxtimes			
Tensioning		\boxtimes			
Guarding				\bowtie	
Bearings		\square			
Belt		\square			
Gearmotor		\square			



Photo A

Photo A shows the damaged link in the belting. We recommend fixing the damaged links to prevent further damage to the belt.

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Item #	M2	Motor #	M2
Description:	Incline Conveyor		

Component	Good Condition	Needs Repair	N/A
Head Pulley	\boxtimes		
Tail Pulley	\square		
Return Roller			\square
Support Roller			\square
Trough Roller			\boxtimes
Lacing			\boxtimes
Tracking	\square		
Tensioning		\square	
Guarding	\boxtimes		
Bearings	\boxtimes		
Belt	\square		
Gearmotor	\square		





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Photos A & B show the lack of tensioning on the belt. We recommend tensioning the belting on a regular basis to prevent premature wear of the belting and sprockets.

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Item #	M3	Motor # M3					
Description:	Metering Drum	Aetering Drum					
Condition	Good Condition	Needs Repair	N/A				
Cleats	\square						
Drive Shaft		\square					
Power Unit	\square						
Bearings	\square						
Hyd. Cylinders	\boxtimes						



Photo A

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Photos A & B show the excessive wrapping around the Metering Drum shafts. We recommend removing these wrappings on a regular basis to prevent damage to the drum or to the support walls.

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Item #	M4A	Motor #	M4A
Description:	Steel Transfer Conveyor	•	

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\boxtimes		
Return Roller			\boxtimes
Support Roller			\square
Trough Roller			\square
Lacing			\boxtimes
Tracking	\square		
Tensioning	\square		
Guarding	\boxtimes		
Bearings		\square	
Belt	\boxtimes		
Gearmotor	\square		





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Photos A & B show the condition of the bearings. We recommend that both head shaft bearings are replaced as soon as possible.

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Item #	M7	Motor #	M7
Description:	OCC Screen		

Component	Good Condition	Needs Repair	N/A
Bearings		\square	
Chains		\square	
Sprockets	\square		
Discs	\square		
Drive Motor &			
Gearbox			
Oilers	\square		



Photo A

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Photos A & B show damage to the bearings. These damaged bearings are a result of the misaligned rotors. Out of time rotors can cause material jams, damaging the bearings as shown. We recommend that the rotors are properly clocked on a regular basis to prevent this problem.





Photo C shows the misalignment of the rotors. This photo also shows the wrappings on the rotors. These wrappings can also lead to material jams resulting in damage to the shafts and bearings. We recommend removing all wrappings on a regular basis.

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Item #	M11	Motor #	M11
Description:	OCC Unders Transfer C	onveyor	

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\boxtimes		
Return Roller			\square
Support Roller	\square		
Trough Roller			\boxtimes
Lacing		\boxtimes	
Tracking	\boxtimes		
Tensioning		\square	
Guarding	\boxtimes		
Bearings		\boxtimes	
Belt	\square		
Gearmotor	\square		





Photo A shows a bad tail pulley bearing. We recommend replacing this bearing to prevent damage to the shaft.

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Item #	M12	Motor #	M12	
Description:	Mixed Transfer Conveyor			

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\boxtimes		
Return Roller	\boxtimes		\square
Support Roller			\square
Trough Roller			\boxtimes
Lacing	\boxtimes		
Tracking	\boxtimes		
Tensioning		\square	
Guarding	\boxtimes		
Bearings		\square	
Belt	\square		
Gearmotor	\square		





Photo A shows the bad bearing on the head pulley. We recommend replacing this bearing when possible to prevent shaft damage.

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Item #	M13	Motor #	M13	
Description:	Scalping Pre-Sort Conveyor			

Component	Good Condition	Needs Repair	N/A
Head Pulley	\boxtimes		
Tail Pulley	\boxtimes		
Return Roller	\square		
Support Roller			\square
Trough Roller			\square
Lacing	\boxtimes		
Tracking	\square		
Tensioning	\boxtimes		
Guarding	\boxtimes		
Bearings	\boxtimes		
Belt			
Gearmotor	\square		





Photo A shows the missing Estop button for this conveyor. We recommend replacing the Estop button as soon as possible.

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Item #	M14		Motor #	M14		
Description:	Scalpin	Scalping Screen				
Component		Good Condition	Needs Rej	pair	N/A	
Bearings		\boxtimes				
Chains		\square				

Chains	\boxtimes		
Sprockets	\boxtimes		
Discs		\boxtimes	
Drive Motor & Gearbox	\boxtimes		
Oilers	\square		

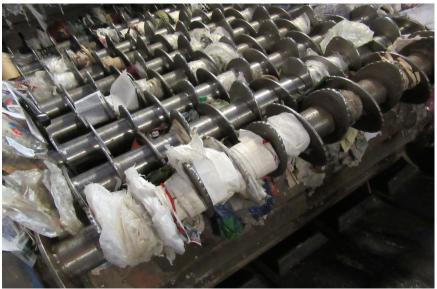


Photo A

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Photos A & B show the worn condition of the rotors. We recommend replacing these rotors to increase the separation performance of this screen. We also recommend removing the wrappings from the rotors on a regular basis to insure maximum separation performance and to prevent material jams.

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Item #	M15	Motor #	M15
Description:	Transfer Conveyor		

Component	Good Condition	Needs Repair	N/A
Head Pulley		\square	
Tail Pulley	\square		
Return Roller	\square		
Support Roller			\square
Trough Roller			\boxtimes
Lacing	\boxtimes		
Tracking	\square		
Tensioning	\boxtimes		
Guarding	\boxtimes		
Bearings	\boxtimes		
Belt	\square		
Gearmotor		\square	





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Photo C

Photo A shows the worn condition of the belt. Some sections of belting are missing and other areas are patched. We recommend replacing this belt when possible to prevent material loss.

Photos B&C show the head pulley wrappings on both sides of the pulley. We recommend removing these wrappings on a regular basis to prevent damage to the bearings.

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Item #	M17	Motor #	M17
Description:	ONP News Screen		

Component	Good Condition	Needs Repair	N/A
Bearings	\square		
Chains		\boxtimes	
Sprockets	\square		
Discs		\boxtimes	
Drive Motor &	\square		
Gearbox			
Oilers	\square		



Photo A

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Photos A & B show the worn and missing finger discs. These discs are crucial to maximizing the material separation for this screen. We recommend replacing all of the finger discs on this screen. Also, the photos show the excessive amount of wrappings on the rotors. We recommend removing the wrappings on a regular basis to help maximize material separation.

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Item #	M22		Motor #	M22	
Description:	CP Scr	een			
Component		Good Condition	n Needs Re	epair	N/A
Bearings				\times	
Chains		\boxtimes	[
Sprockets		\boxtimes	[
Discs				\boxtimes	
Drive Motor & Gearbox		\square	[
Oilers					

NO PHOTO AVAILABLE.

Deck 3 drive side bearing #1 is bad. We recommend replacing this bearing as soon as possible to prevent damage to the shaft.

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Item #	M29	Motor #	M29
Description:	Glassbreaker Screen		

Component	Good Condition	Needs Repair	N/A
Bearings		\boxtimes	
Chains	\square		
Sprockets	\boxtimes		
Discs	\square		
Drive Motor &	\square		
Gearbox			
Oilers		\square	



Photo A

Photo A shows one of the many bad bearings on this screen. We recommend replacing all damaged bearings on this screen to prevent damage to the rotors.

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Photo B shows the empty oiler. We recommend that the oiler is filled and put back into use.

Deck 1 on the drive side requires new bearings on shafts 3, 8 & 9. Shaft #8 on deck 1 needs to be replaced.

Deck 2 on the drive side requires new bearings on shafts 1, 2, 3, 5, 7, 9 & 10.

Deck 2–shaft #2 on the driven side needs to be replaced.

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Item #	M30	Motor #	M30
Description:	ADS Feed Conveyor		

Component	Good Condition	Needs Repair	N/A
Head Pulley	\boxtimes		
Tail Pulley	\boxtimes		
Return Roller	\square		
Support Roller			\square
Trough Roller			\boxtimes
Lacing	\boxtimes		
Tracking	\square		
Tensioning	\boxtimes		
Guarding	\boxtimes		
Bearings	\boxtimes		
Belt	\square		
Gearmotor		\square	





Photo A shows the worn condition of the belting. We recommend replacing this belt when possible.

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Item #	M31B	Motor #	M31B
Description:	ADS Double		

Condition	Good Condition	Needs Repair	N/A
Rollers			
Seals	\square		
Drum			
Motors			
Farr Unit			
Blowers			
Impellor	\square		



Photo A

ADS guide plate is missing. We recommend that the guide plate is replaced to increase performance.

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Item #	M37	Motor #	M37
Description:	Fiber Transfer Conveyor	r	

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\boxtimes		
Return Roller	\boxtimes		
Support Roller			\boxtimes
Trough Roller			\boxtimes
Lacing	\boxtimes		
Tracking	\boxtimes		
Tensioning	\square		
Guarding	\boxtimes		
Bearings	\boxtimes		
Belt	\square		
Gearmotor	\square		



Photo A

Photo A shows the gear motor supported by a chain. We recommend replacing the torque arm bracket and mounting the gear motor properly to prevent damage to the pulley or gear motor.

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Item #	M48	Motor #	M48
Description:	Over Belt Magnet		

Component	Good Condition	Needs Repair	N/A
Head Pulley	\boxtimes		
Tail Pulley	\boxtimes		
Return Roller	\boxtimes		
Support Roller			\square
Trough Roller			\square
Lacing	\boxtimes		
Tracking	\boxtimes		
Tensioning	\boxtimes		
Guarding	\boxtimes		
Bearings	\square		
Belt	\square		
Gearmotor	\square		

The Over Belt Magnet was in good condition during our inspection.

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		Motor # M50A	
Description: M	ISS Aladdin		
Condition	Good Condition	Needs Repair	N/A
Head Pulley			
Tail Pulley			
Return Roller			
Support Roller			
Trough Roller			
Lacing			
Tracking	\square		
Tensioning			
Guarding			
Bearings			
Compressor			
Optics			
Belt			

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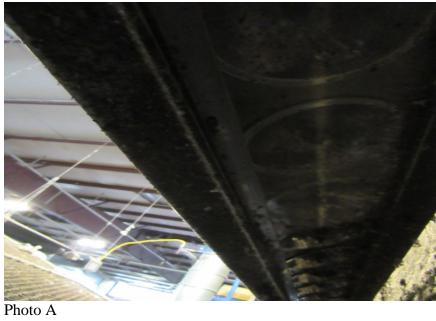




Photo A shows the missing glass on the light bar. One was on order at time of audit.

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M50A	Motor #	Ν	M50A	Item #
			MSS Aladdin	Description:
			-	
 				Description:

Condition	Good Condition	Needs Repair	N/A
Bearings			
Drive Motor & Gearbox	\square		
Blowers			
Intakes			
Exhaust			
Guarding			





Photo A shows some debris that has built up on the impellor. We recommend that the impellor be cleaned on a regular basis. The silo blower overall is in good condition.

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Item #	M55	Motor #	M55
Description:	Eddy Current		

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\square		
Return Roller	\square		
Support Roller			\square
Trough Roller			\boxtimes
Lacing	\square		
Tracking	\square		
Tensioning	\square		
Guarding	\square		
Bearings	\square		
Belt		\square	
Gearmotor	\square		

No photo available.

Drive belt missing from pulley motor. We recommend replacing the missing drive belt as soon as possible to prevent Eddy Current failure.

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Item #	M62		Motor #	M62			
Description:	Glas	Glass Transfer Conveyor					
Component		Good Condition	Need	s Repair	N/A		
Head Pulley		\square					
Tail Pulley		\square					
Return Roller		\boxtimes					
Support Roller						\boxtimes	
Trough Roller						\boxtimes	
Lacing		\square					
Tracking		\square					
Tensioning		\square					
Guarding		\square					
Bearings		\square					
Belt				\square			
Gearmotor							



Photo A

Photo A shows the jammed up- turn roller. We recommend replacing these rollers when possible. Also, the lacing is damaged and in need of repair to prevent material loss.

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Item #	M64A, B & C	Motor #	M64A, B & C
Description:	Glass Cleanup System		

Condition	Good Condition	Needs Repair	N/A
Rotary Valve Vanes			
Cyclone Liners		\boxtimes	
Blower Impellor Blade	\square		
Sock	\square		
Ducting			
Gearmotor			
Conveyor Belt			
Separation Chamber			



Photo A

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Photos A & B show the worn condition of the urethane liners in the cyclone. We recommend replacing these liners to help maximize the glass cleanup's efficiency. We also recommend that the seals be adjusted so that they meet the conveyor belt. This will help with the separation quality.

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Item #	M72	Motor #	M72
Description:	Baler Feed Conveyor		

Component	Good Condition	Needs Repair	N/A
Head Pulley	\square		
Tail Pulley	\square		
Return Roller	\square		
Support Roller			\square
Trough Roller			\boxtimes
Lacing			\boxtimes
Tracking	\square		
Tensioning	\square		
Guarding	\square		
Bearings	\square		
Belt		\square	
Gearmotor			



Photo A

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Photo B

Photos A & B show the missing or damaged belting sections. We recommend replacing this belt when possible.

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Item #	M73 M		lotor #	M73				
Description:	Gorilla	Gorilla Baler						
Component		Good Condition Needs Repair N/A						
Bearings						\square		
Chains						\square		
Sprockets						\square		
Discs						\square		
Drive Motor & Gearbox						\square		
Oilers						\square		





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Photo C

The overall condition of the baler is good. There is a ¹/₄" knife gap that should be monitored. We also recommend flipping the blades. Shim and adjustment is also recommended. The door ram area needs to be cleaned and there is a radiator leak that was being repaired while we were on site.

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Summary:

From a mechanical perspective, the equipment is performing as designed. The condition of the equipment is in good operating condition overall. The following are some bullet points from our audit:

- 1. The OCC Screen requires some maintenance attention as soon as possible. There are multiple bearings that require replacement immediately. We recommend that these shafts are clocked accordingly as soon as possible.
- 2. The Newscreen should have all of the rubber finger discs replaced as soon as possible to maximize material separation. These discs are crucial in optimizing the screens performance.
- 3. Steel Belt Conveyors are running with too much slack. The steel belt conveyor for the Incline Conveyor C-2 is in need of tensioning to prevent costly belt and sprocket damage.
- 4. Rubber Belt Conveyors need to have the belting replaced once the belting is completely worn. Multiple conveyors were seen with patches or missing sections in the belting. The conveyors also need to have some maintenance attention on the return rollers.
- 5. The Metering Drum needs some maintenance attention. The shaft wrappings that were seen during our inspection are causing damage to the sidewalls of the Metering Drum.

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