



Memorandum

10/30/18

To: Steve Giesbrecht, Borough Manager  
Mayor Jensen and Members of the Borough Assembly  
From: Chris Cotta, Public Works Director  
Re: Solid Waste Baler Status

Petersburg's baling facility was built in the mid-1990s and started operations in August of 1996. Since that time the solid waste baler has been used to bale the community's solid waste and more recently, recyclables as well. The baler consists of several major components that all work together to compact solid waste and process it into bales, which are then loaded into 40' shipping containers for transport south. A brief overview of the process is as follows:

- 1) Conveyor stage: Garbage is emptied from the collection trucks onto the baler floor. It is then pushed by a front-end loader onto a conveyor belt and transported up an incline. Once garbage reaches the top of the conveyor, it falls into a hopper.
- 2) Compaction: Once the hopper is full, the baler operator activates the main ram to push garbage from the hopper into an adjacent bale chamber, where it is compacted into a rectangular shape.
- 3) Ejection: After compaction of the bale is complete, a side ram pushes it out onto a set of elevated rails. As the compacted bale exits the bale chamber, a wire tie unit wraps the bale with wire under tension, to maintain the shape of the bale and allow it to be handled without coming apart.
- 4) Once all wire wrap is complete the bale is weighed and loaded into a shipping container via forklift.

The solid waste baler is a complex machine with many moving parts. Major working components of the baler are the belt conveyor; control system; hydraulic system; wear surfaces on the rams, hopper & bale chamber; mainframe/structure; and wire tie unit. Some of these components require periodic maintenance and/or replacement, while others are expected to last the life of the machine. Although the mainframe of our baler appears to be in good condition, many of the other portions of the machine have failed or are failing. A breakdown of these items is as follows:

- Belt Conveyor: The conveyor frame has been deteriorating for several years now and is approaching the point of structural failure. It is too corroded to economically rebuild and was budgeted for replacement in FY16 at a cost of \$100,000. Proposals for conveyor replacement came in well over what was budgeted (\$150-200K), so the project was deferred. The conveyor belt was last replaced in 2010 and is due for replacement again. A belt failure is what initiated the extended downtime we experienced this past spring. A new belt costs about \$45K and

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would have been part of a complete conveyor replacement. However, just replacing the belt at this time would not solve the larger structural issues described above.

- **Control system:** The main processor for the control system failed earlier this year and caused the baler to be down for several weeks while repairs were made. A backup controller also failed to resolve the problem. Neither hardware nor software support is available for the long obsolete control system. However, with the assistance of Mattingly Electric, we were able to get some functionality back, but not all. A full update of the control system is needed and is beyond the scope of what local electricians are able to provide. The last estimate we got for a full control system replacement was approximately \$150,000.
- **Hydraulic system:** This portion of the baler has not given us any major trouble lately and appears to be in good shape even though over 20 years old.
- **Wear surfaces on rams, hopper and bale chamber:** These linings are AR400 abrasion resistant steel and require periodic replacement. This was last done in 2009 at a total cost of approximately \$100,000. The wear surfaces replaced in '09 have begun to fail and are in need of replacement again. Estimated cost would be \$120,000.
- **Mainframe/structure:** Appears to be in good condition, with spot repairs needed.
- **Wire tie unit:** The original wire tie machine was known to be in poor condition due to age and heavy use. It was our intention to attempt a rebuild of the wire tie machine this year and we had budgeted \$10K for this. However, extreme wear on all major working portions of the machine was causing it to become highly unpredictable and unsafe to operate. A combination of repeated breakdowns, unreliable/hazardous operation, and higher than expected cost to rehab caused us to leave it turned off the last time it broke down. We have a new wire tie unit ordered that is expected to arrive mid-November. Cost of the new wire tie unit was a little less than \$29,000 and is being funded out of the Sanitation Dept's FY19 machinery & equipment budget. This unit should continue to serve for many years whether the baler is partially or fully replaced.

There are 3 major options for the solid waste baler going forward: 1) Reactive maintenance – replacing components as they fail and cause outages; 2) Partial replacement, consisting of conveyor and control system replacement, and a reline of all wear surfaces; and 3) Full replacement – minus the wire tie unit, which is being replaced now as described above.

Option 1 – Reactive maintenance, is not advisable for multiple reasons - the biggest of which is worker and customer safety. If, for instance, the conveyor structure should fail, it could cause a structural collapse and anything or anyone that is on or near the horizontal portion of the belt (over the pit) could potentially fall in. Another reason is the unpredictable nature of the failures – not only will they cause extended, unplanned downtime, they will result in hefty unbudgeted expenditures as well.

Option 2 – Rehab of all failed or failing components. Doing some quick math, this would involve the following:

Belt conveyor	\$150,000
Control system	\$150,000
<u>Reline of wear surfaces</u>	<u>\$120,000</u>
Estimated project total	\$420,000

Option 3 – Full replacement of the solid waste baler. This breaks down as follows:

Baler w/ controls	\$400,000
<u>Belt conveyor</u>	<u>\$150,000</u>
Estimated project total	\$550,000

Partial and full replacement both represent major capital expenditures and either option will stretch the financial resources of the Sanitation Dept. to the maximum. Although the partial replacement option is less costly overall, there are major portions of the machine that would not be replaced – like the hydraulic system and the mainframe. Spending \$420K to partially replace a 22-year-old machine is less cost effective in the long run than investing \$550K in a new solid waste baler, which should have a service life of 20 years or more.

For the above reasons, Public Works recommends moving forward with the full replacement option. The first steps will be to fully assess the Sanitation Dept's finances and project funding options, start a supplemental budget process, and then develop project specifications and bid documents geared toward replacement of the baler in the spring of 2019. Rates will also need to be examined as part of this process, to see if future rate increases are needed to help build up reserves that would be mostly or fully depleted by funding a baler purchase.

Public Works is requesting the Assembly's approval to proceed with development of a full replacement project as described above. It is important to note that no funds will be expended on the project without the additional Assembly approvals needed to complete the supplemental budget process. This means that should the Assembly vote now in favor of proceeding forward with the project, that there will still be additional opportunities for public discussion prior to any future project expenditures.

I'll be happy to answer any questions you may have at this time. Thank you.