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2014 Achievement Awards



2014 VACo Achievement Awards

Deadline: June 2, 2014

Application Form

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 2, 2014.**

Program Information

Locality Hanover County

Program Title Solid Waste Compactor Stormwater Pollution Prevention

Program Category Environmental

Contact Information

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Signature of county administrator or chief administrative officer

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Title County Administrator

Signature *Cecil R. Harris Jr.*

Call for Entries

Hanover County
Solid Waste Compactor Stormwater Pollution Prevention
Overview

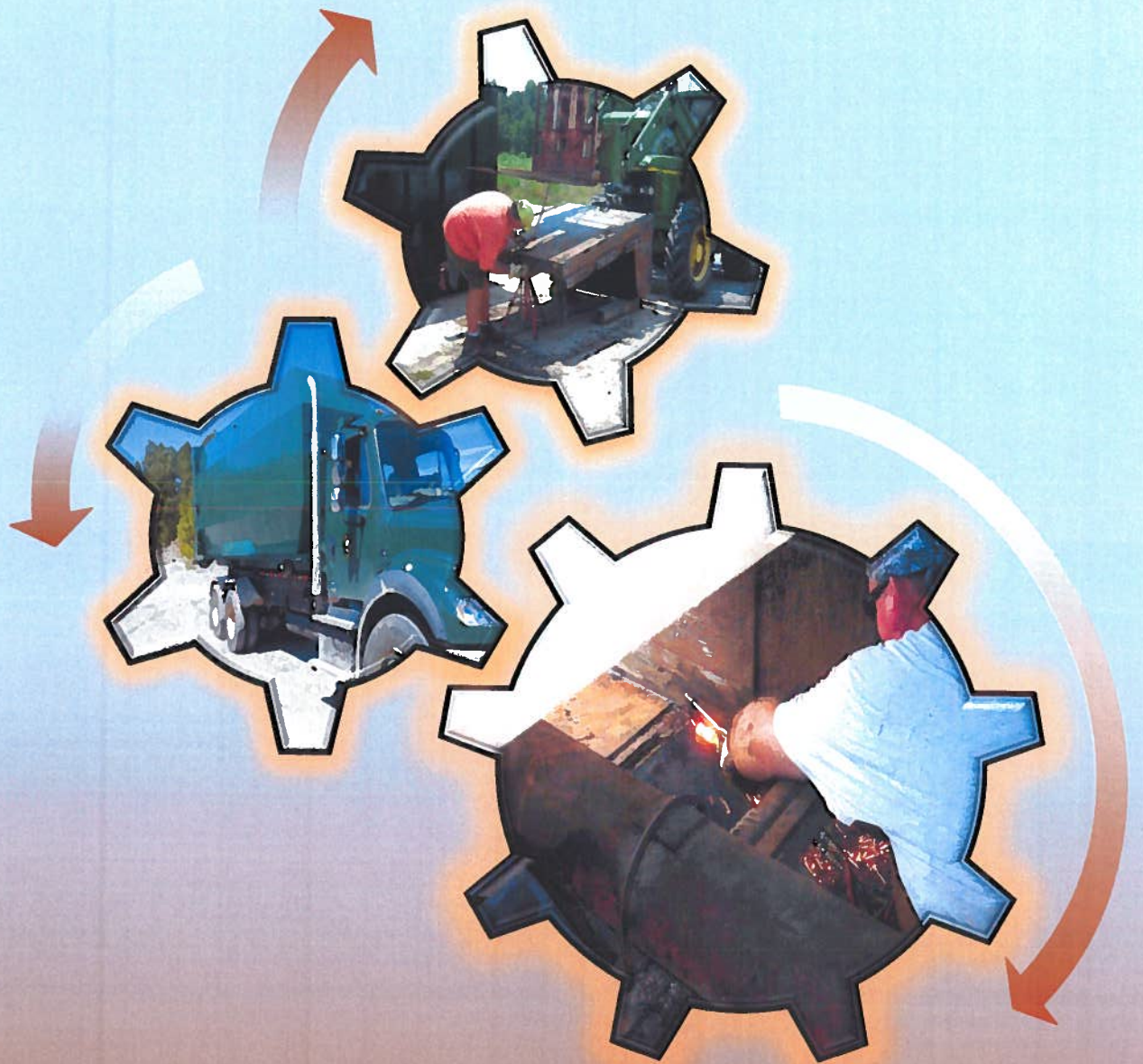
The Hanover County Department of Public Works is committed to collecting solid waste in a manner that least impacts the environment. Hanover County manages its residential waste stream by operating six solid waste convenience centers that receive over 26,000 tons of municipal solid waste (MSW) per year. In addition, the solid waste convenience centers collect significant amounts of recyclables including containers, paper, yard waste and special wastes.

As is the case with many convenience centers throughout Virginia, Hanover County utilizes stationary compactors to maximize its payloads prior to transport to the central 301 Transfer Station. Hanover County recognized that the design of the stationary compactors and the standard roll-off compactor container leaked both liquids and solids during the compaction process. Hanover County was determined to design a system that eliminated both types of discharges which threatened to pollute the environment.

To solve the very difficult issues required us to work directly with vendors to develop new designs for the stationary compactors and roll-off containers. In addition, new technology for stormwater prevention needed to be introduced while making changes to operating standards.

The result of this undertaking is a system that provides significant protection of the environment during solid waste collection and processing. Other local jurisdictions and the Virginia Department of Environmental Quality have visited Hanover County solid waste facilities to observe and better understand the methods and their application.

Hanover County



Solid Waste Compactor
Stormwater Pollution Prevention

Hanover County Stationary Compactor System

Hanover County has six solid waste convenience centers equipped with nine stationary compactors for MSW. Three of the stationary compactors are standard (RJ 550) and six are pre-crushing units (RJ 450 PC). The added feature of a pre-crusher is its movable steel wall that bulky material is crushed against. All of the compactors used by Hanover County are manufactured by Marathon Equipment. Various manufacturers are used to produce the roll-off compactor containers.



Three major areas of concern were identified. Two were associated with the compactor and one with the container.

The snout is the portion of the stationary compactor that extends into the container. The compacted solid waste is transported across the snout into the container. The difficulty is that liquids often leak out since the snout (standard snout is five inches) may not extend far enough into the container to get beyond the container door. Hanover County redesigned the snout to extend thirteen inches into the container and in other words, the entire length of compaction ram penetration or well past the door interface.

A standard compactor is designed to discharge both liquids and solids that build up under the compaction blade. The discharge takes place as the blade retracts during its normal return cycle. The compactor is equipped with hinged side doors that allow for the release of liquids and manual removal of solid debris. This system was of great concern. Hanover County

researched compactor manufacturers throughout the nation to see if anyone had developed an alternative design. SP Industries, a mid-west company, had developed a baffle system to collect discharging material that was primarily used for wet loads (melting ice) from commercial airlines. Hanover County began working with the baffle concept to see if it could be applied to other compactor systems. There were immediate challenges associated with the compaction cylinder placement and connected hoses as well as the cylinder cross supports. Hanover County staff designed a baffle with a discharge lip for a trial on a standard and pre-crusher compactor. The lip allowed for the system to have some storage capacity. The first unit installed was the standard stationary compactor. The baffle extended the entire width of the unit and discharged along the bottom where the opening is located. The baffle had a slight angle to promote contaminated liquid discharge into the roll-off compactor container. The lip



was seven inches tall at a forty-five degree angle. The system worked by discharging liquid and solid waste material into a plastic clean out tray located

in the other half of the bottom low maintenance system. The first of these improvements was applied to the pre-crusher pilot design.



The angle of the lip was reduced by fifty percent as well as the length of the lip. This modification allowed for an easier flow of discharge waste into the receiving tray.

Hanover County staff was now ready to work with Marathon Equipment to redesign a compactor baffle system based on what it had learned from its two pilot projects. Drawings were prepared by Hanover County Public Works staff with the new baffle concept including the shorter and lower lip. In addition the design included turning the compaction cylinder upside down to remove the hydraulic hoses from the baffle area and thus, eliminate a potential area of material bridging. A side clean out door was also designed to provide improved access to any jams. Marathon Equipment's engineers turned the Public Works concept drawings into design specifications and the project, which consisted of two new RJ 550 compactors were ready to be bid.

Hanover County was able to purchase the two compactors for \$46,500. Public Works staff installed the compactors and placed the units into service after attaching them to the hoppers. The stationary compactors functioned perfectly. Liquid and solid debris were retained with the baffle system and were discharged over the lip into the clean out tray. Employees no longer had the difficult and messy job of cleaning under the compactor. Rain water mixing with the waste and requiring clean-up is no longer a challenge. The environment is protected and the employees working conditions such as leachate exposure are greatly improved as liquid materials drain to the container and solids discharge into the holding tray for clean-out. The same technology will be applied to all future Hanover County compactor purchases including a pre-crusher in the next fiscal year.

Compactor Cover

A constant environmental concern is rain water that enters into the normal stationary



compactor. A carport kit was ordered and divided into thirds. Public Works staff installed the covers over all three stationary compactors at its Mechanicsville Solid Waste Convenience Center which eliminated direct rainfall into the units.

Roll-off Compaction Container

The compaction container is the other critical component in the system. A typical container is forty cubic yards and octagonal in design. The ram from the compactor pushes MSW into the container. A rear door with an opening for the compactor blade is attached and opens when waste is discharged at the 301 Transfer Station. Because the door is not water tight, liquids would leak from the door and container body interface. The solution needed to be two fold.

Hanover County decided to use technology typically associated with wet waste or sludge hauling.

A design for the door included a water tight gasket and ratchet system to tighten the door seal.

The compactor blade opening in the container door started



at four inches above the floor to allow for a liquid holding capacity within the container of three hundred gallons. The unique containers were manufactured by Buck's Manufacturing and have



solved the liquid discharge issue.

Conclusion

Hanover County has developed an aggressive program and design to significantly reduce the exposure of solid waste to rainfall. Stationary compactor designs have been modified to control the discharge of solids and liquids from both the stationary compactors and roll-off compactor containers. Off the shelf designs were not available so a

collaborative effort was required with various manufacturers following pilot test installations engineered by Hanover County Public Works. Numerous government officials and nearby jurisdictions have visited the convenience centers to observe the design and the manufacturers now offer the Hanover County design as an option when ordering a compactor.

