

Greening Up A Business Preserves Land Value

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The scrap metal recycling industry has certainly changed significantly since Middleboro Recycling Inc. was founded in the 1940s. In fact, until the mid 1960s, the common method to dispose of an automobile at a junkyard was to burn it, and then send the remaining steel shell to a processing plant. Today, strict environmental regulations will not allow such expedient processing. Rigorous procedures must be followed to make assure that all hazardous materials including motor oil, gasoline, anti-freeze, and other fluids, as well as batteries, mercury switches, catalytic converters and tires are removed from a vehicle

and safely recycled or properly disposed of before the car is crushed or shredded.

Before



After



In an effort to improve regulatory compliance, the Massachusetts Department of Environmental Protection (MADEP) began to focus its monitoring and enforcement activity on automobile recycling companies. Working with the MADEP, Middleboro Recycling discovered that revamping its operations could be a cost effective way to improve compliance, as well as operations. In response, Middleboro Recycling engaged Resource Control Associates, Inc. for help in redesigning and upgrading its facility and related operations. The results have been impressive, and Middleboro Recycling has become a leader in an important segment of the green environmental movement.

Scrap Metal: An Environmental Industry

While the scrap metal business is often considered a dirty junkyard industry, it actually provides a key environmental protection service. Today's scrap metal facilities recycle millions of tons of automobiles, discarded industrial equipment, tires, batteries, hazardous fluids, household appliances, and many other items that would otherwise find their way into the environment.

As is often the case, adhering to the various regulatory programs can carry hidden benefits such as preserving the value of land by properly managing waste oil and other hazardous wastes. Contaminated land can become virtually worthless, so this is a case where cleaning up the environment also makes good business sense. Any business that handles or uses oils and hazardous waste should consider constructing Best Management Practices (BMPs) to guard against spills or accidents that could contaminate the property. Depending upon the nature of the business and the property, implementing well planned and engineered management programs will ensure regulatory compliance and help protect a major asset; your land.

Consider Middleboro Recycling's Challenge

While Middleboro Recycling's effort required a significant investment, its new operation is far more efficient and cost effective, and is very successful in keeping hazardous waste out of the environment. During the past two years, the company has completely reorganized and rebuilt its yard, incorporated a stronger storm water management infrastructure, and instituted a state-of-the-art fluids recovery system, while attaining full regulatory compliance.

Prior to the makeover, it had been common practice for Middleboro Recycling and the state's other automobile recyclers to remove batteries and other spare parts and then crush old vehicles without first draining all the fluids. As a result, it was difficult to capture all of the fluids, but no longer. The new operation makes it faster and more efficient to recycle as much of the each vehicle as possible.

Regulation as the Mother of Invention

The new requirement to drain all fluids before crushing posed a challenge for *Scott Zion of Middleboro Recycling*. In the past, workers drained fluids by puncturing the gas tank in each vehicle and somehow tipping the car so that gravity could fully drain the contents. There was no obvious, efficient, or safe way to do this, though. Fortunately, after considerable research and a number of site visits to other yards, Zion located an out of state manufacturer of a unique fluids recovery system and engaged them to design of a rack system capable of meeting Scott's challenge. The new fluids recovery facility in operation today at Middleboro is the end-result of this design process.

In 2007, Middleboro Recycling recycled:

Incoming scrap:

Vehicles: 15,155 tons per year
Misc. scrap: 6,878 tons per year
Average: 3,200 lbs per vehicle
Vehicles per year: 9,472
Operations averaged 305 days per year
Average vehicles per day: 31

Outgoing Steel: 22,093 tons per year

Liquids:

Motor oil, transmission fluid and brake fluid mixture:
16,605 gallons
Antifreeze: 2,306 gallons
Gasoline - All gasoline is recovered prior to crushing vehicles, and then transferred to a tote bin and dispensed to customers. Product recovered is not metered.

Components:

Tires shipped off site: 212 tons
Batteries processed: 717 tons
Mercury Switches: 1,350 pieces
Catalytic converters: processed: 15,302 units

“With our current staffing, there was no way we would have kept up with our volume if we had to drain all the fluids without this system,” Zion says. With vehicles securely held in place by the racking system, safety is dramatically improved. In addition to implementing strong environmental protection measures, “there’s less of a chance of a fire being started by sparking gasoline or cars tipping over and injuring workers,” Zion says.

Resource Controls and the rack system fabricator designed key elements of the revamped facility, including the fluids recovery facility, a liquid storage tank farm, gasoline reuse system, concrete pads for operating areas, and battery handling improvements. After gasoline is removed from a vehicle and given to the vehicle’s owner if desired, all other fluids are drained into a fluids recovery system. From there, the fluids go to a separator that separates anti-freeze from the other fluids by gravity. Used motor oil, brake fluid, and transmission fluid are stored and used by Middleboro Recycling to heat its processing shed via a waste oil space heater or sold off for reprocessing. Windshield fluid is recovered for reuse and anti-freeze is shipped away to be recycled. Mercury switches are removed for recycling, along with tires, batteries, and catalytic converters. Recovered diesel fuel is used to fire a radiant heat system in the floor. Nothing goes to waste and a full compliment of Best Management Practices (BMPs) have been implemented to reduce the possible release of hazardous materials to the environment.

Another key piece of this project was a complete re-grading of the property and redesign of the storm water management system, including an updated SPCC Plan, RCRA Waste Management Plan, and Storm Water Pollution

Prevention Plan (SWPPP). Even though the US EPA has not renewed storm water management requirements under the Multi-Sector Permit Program, Middleboro implemented many upgrades to be out in front of this pending program. This aspect of the project was especially critical because Middleboro Recycling borders protected wetlands on three sides. The re-graded property directs all storm water away from the wetlands and captures it in a retaining pond. Here, contaminants settle to the bottom and

Regulatory Programs That Applied to Middleboro Recycling’s Project:

- 1) RCRA and hazardous waste management:
 - a) Storage time limitations
 - b) Waste storage containment and security
 - c) Container labeling
 - d) Proper registration
- 2) Storm Water Management Policy:
 - a) Multi-Sector Group Storm Water Permit
 - b) SWPPP
 - c) BMPs
 - d) Compliance with Mass. standards by new grading plan to enable better capture of storm water, erosion sediment and allow for pre-treatment prior to release
- 3) Wetland Protection:
 - a) Improve erosion control by re-grading to capture all runoff and to prevent impacts on the adjoin wetland
- 4) Massachusetts Contingency Plan (Oil and Hazardous Materials Releases):
 - a) Better management of waste eliminates risk of a release

the cleaner water at the top of the pond is directed off the property. The storm water system also includes a pre-treatment component that separates oil from storm water at the crusher site to capture any residual pollutants. Resource Controls designed this system, which fully complies with the state's stringent environmental regulations.

Penalty Used Towards Compliance

Fluids Recovery System



Fluids Recovery Building



An interesting footnote to this project is that Middleboro Recycling, like many other automobile recyclers, had been fined for non-compliance by the Massachusetts Department of Environmental Protection (MADEP) before the project was completed. However, MADEP policy allows for Supplemental Environmental Projects (SEPs) to reduce the monetary amount of penalties to be paid when such projects meet certain categories such as pollution prevention or source reduction activities, along with attaining compliance with applicable regulations. The MADEP worked with Middleboro Recycling to allow additional time to plan, design, construct and implement these important facility upgrades. This approach illustrates the MADEP's goal of promoting recycling and environmental benefits over and above simply returning a facility to compliance.

With all hazardous materials now captured and kept out of the environment and a modern storm water drainage system in place, the site has a much lower risk of environmental contamination.

Thus, this project not only brings the company into complete compliance with environmental regulations and improves its efficiency and safety, but it also protects the long-term value of the property.

About the Authors:

Scott Zion – Grandson and third generation family operator of Middleboro Recycling, founded in 1947. Scot currently runs the yard with his father, Robert Zion.

Robert C. Atwood, PE, LSP - *President* of Resource Controls, founded Resource Controls in 1986. His primary area of focus is in the area of business development and engineering design services. Mr. Atwood's 34 year background as a Registered Professional Engineer and Licensed Site Professional offers broad-based experience and knowledge of civil engineering design and construction management, as well as environmental assessment and remediation.