

**Landfills: This Ain't Your  
Grandfather's Dump  
City of Lebanon  
Regional Solid Waste Facility**

**January 15, 2020**

Marc Morgan, Solid Waste Manager  
City of Lebanon, NH

# COL Sanitary Landfill

- City bought 100 acres in 1950 to establish a dump along 12A in West Lebanon.
- In 1990's added the first recycling area in conjunction with the UVSW Group in Vermont.
- Operated as an unlined landfill until 1994 when the first lined cells were installed.
- New recycling area added in 2004/05 along with new maintenance/admin building, truck scales & scale house.
- 8 Full Time employees operate the facility 6 days per week.
- Serves 11 Towns in NH & 12 Towns in VT = 76,000 pop.

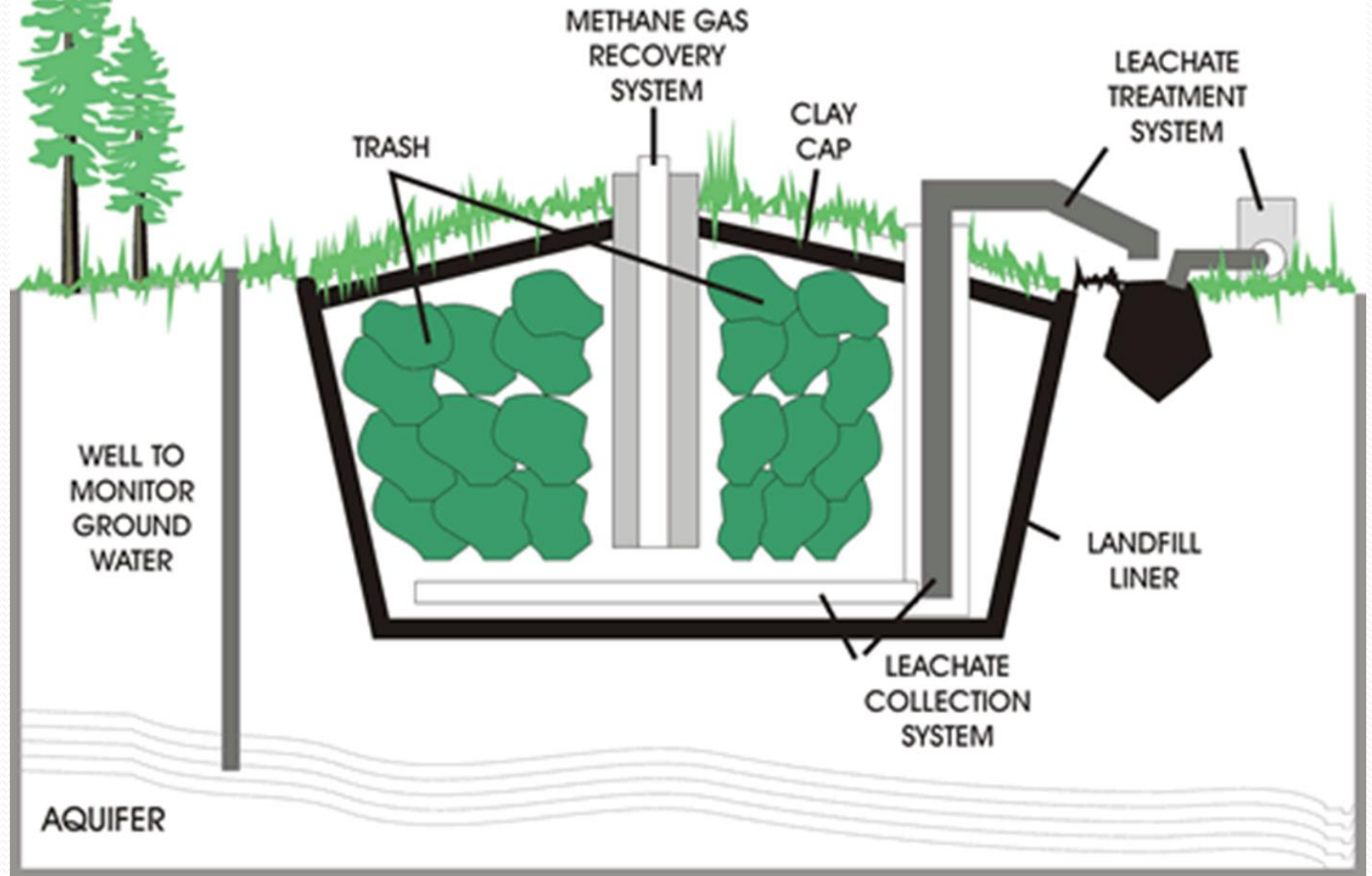
# First Lined Cells in Lebanon



# Landfill Components

- Phase II-C cell was constructed in 2013.
- Phases II-A & II-B approx. 90% filled.
- Phase I approx. 95% filled.
- A Gas Collection and Control System was installed in late 2013 to remove landfill gas.
- Gas Flare (750 cfm cap.) installed and operating January 2015.
- Developing a Gas to Energy Program
- Leachate is collected & piped to the Lebanon WWTP.
  - Approx. 4.5 million gals/yr.

# MODERN LANDFILL



## Final Construction of Phase II-C



Phase II-C - looking west



Phase II-C - looking east with liner of II-B exposed on left

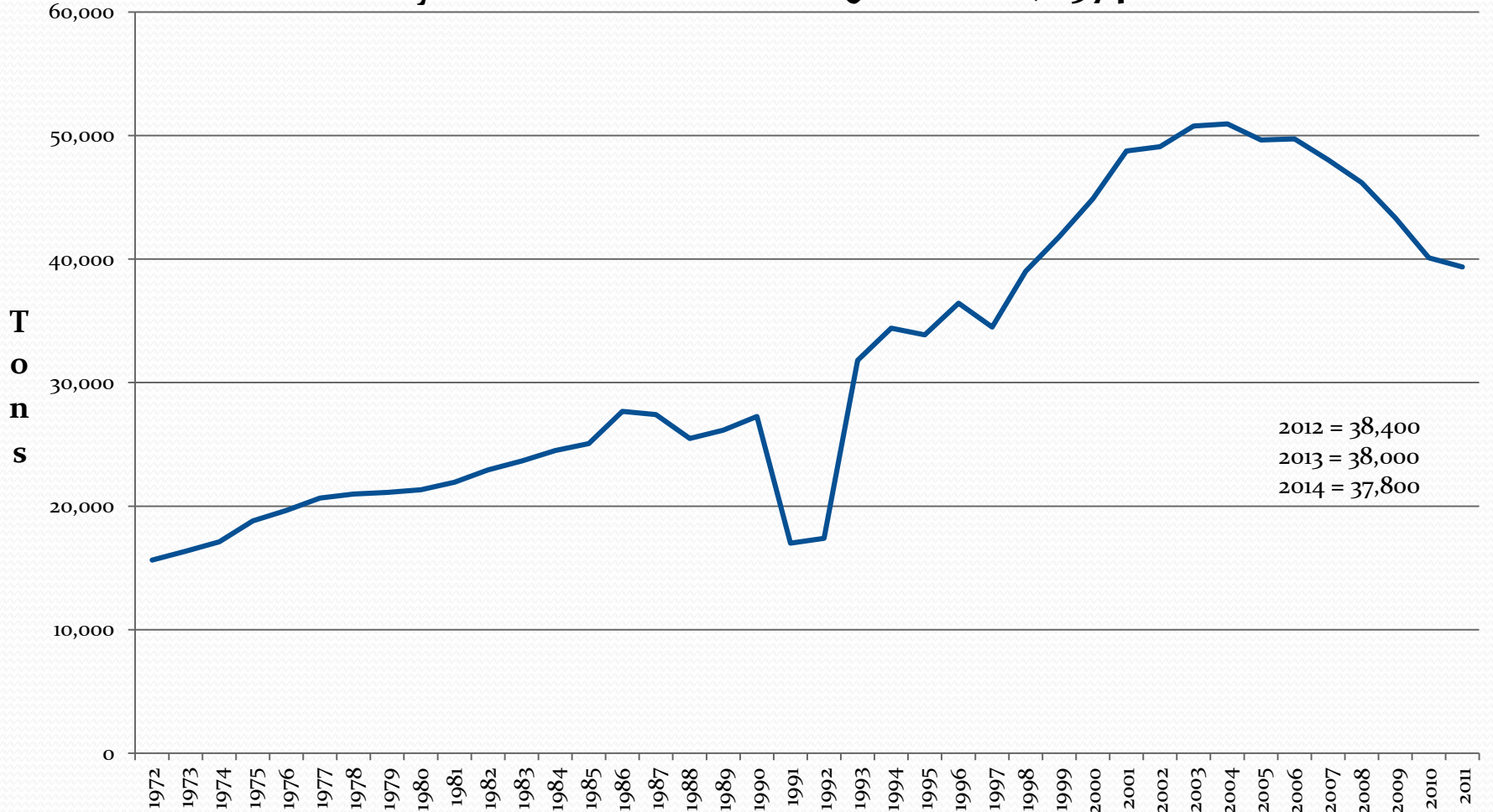




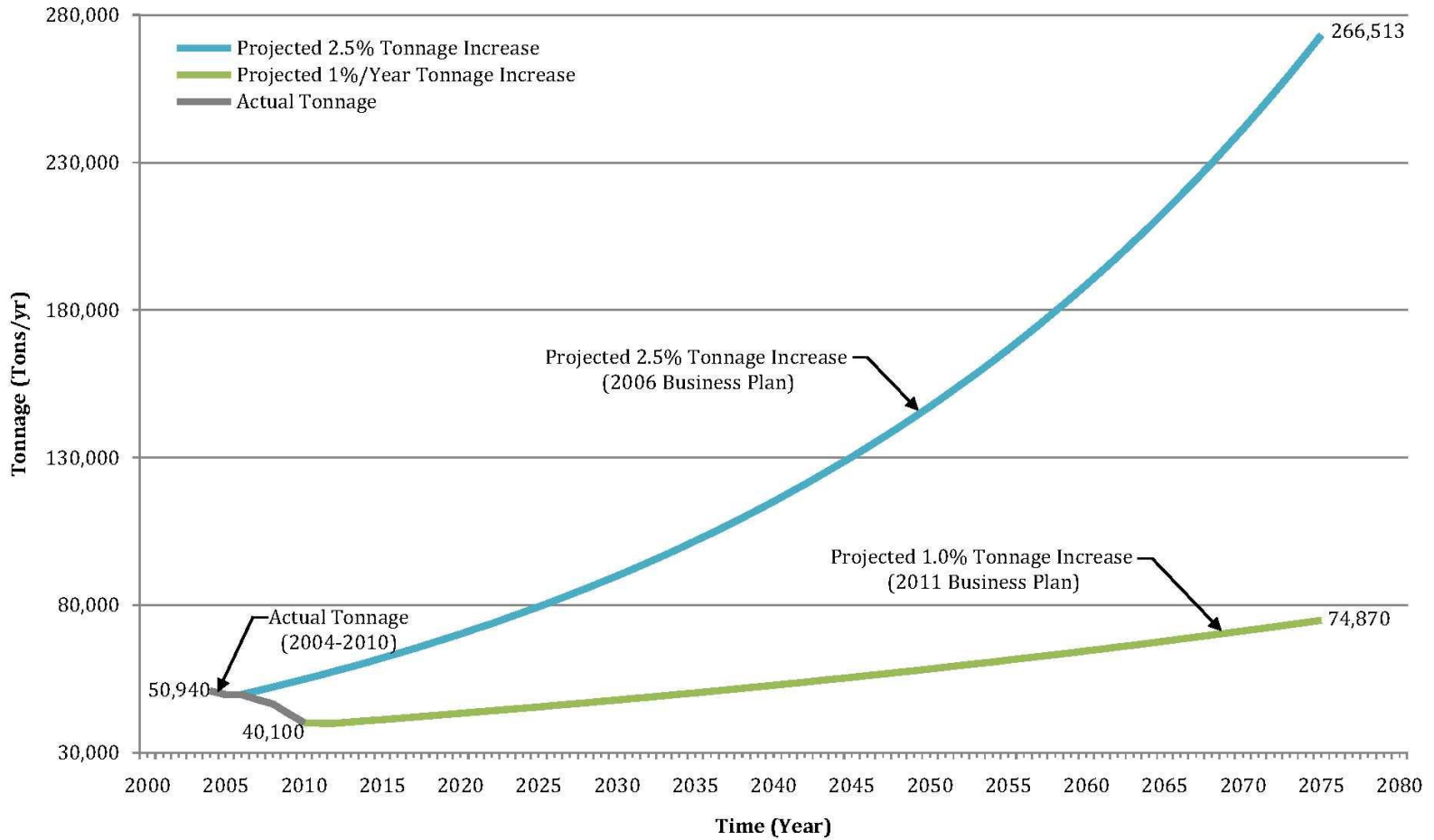
# Leachate Collection Pipe, 18" diameter



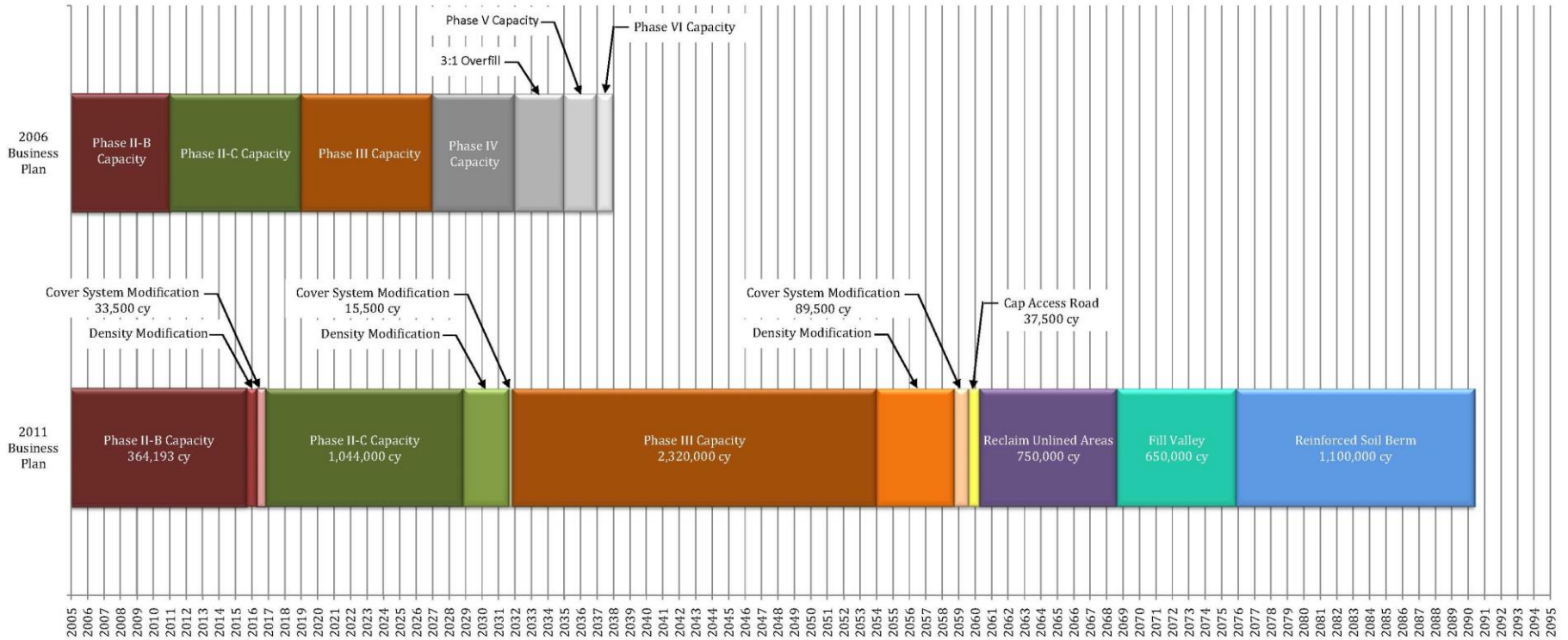
# City of Lebanon Landfill Quantities, 1974 - 2011



**Figure 2**  
 Actual and Projected Tonnage Rates  
 Solid Waste Business Plan  
 City of Lebanon Landfill  
 Lebanon, New Hampshire



**Figure 3**  
 Projected Landfill Lifespan  
 Solid Waste Business Plan  
 City of Lebanon Landfill  
 Lebanon, New Hampshire



**Notes and Assumptions:**

1. Assumed there will be a 1 percent increase in tonnage acceptance at the landfill starting in 2013 and continuing for the life of the landfill.
2. Assumed 20 percent of available airspace will be used for daily cover.
3. Phase II-B has a remaining airspace volume of 364,193 cy as of October 2010 (based on survey data provided by the City of Lebanon).
4. Phase II-C will have an airspace volume of 1,044,000 cy (based on capacities calculated by CMA and represented in the 2006 Business Plan).
5. Phase III will have an airspace volume of 1,100,000 cy (based on capacities calculated by CMA and represented in the 2006 Business Plan).
6. Phase capacity is based upon the available airspace volume, tonnage accepted, and an assumed waste density of 1,280 lbs/cy (based on survey data provided by the City of Lebanon).
7. Density Modification is based upon utilizing a waste shredder and implementing leachate recirculation resulting in an assumed waste density of 1,600 lbs/cy.
8. For Phase II-B, it is assumed the waste shredder will be implemented in 2012, resulting in a waste density of 1,400 lbs/cy. Leachate recirculation will be implemented starting in 2013, therefore the waste density is expected to improve to 1,600 lbs/cy.
9. For Phase II-C and Phase III, it is assumed that both the waste shredder and leachate recirculation will be implemented from the start of filling to provide a waste density of 1,600 lbs/cy.
10. Cover System Modification volume is calculated assuming a decrease in cover thickness to 1.5 ft over the area of the landfill phases and installing swales below the final cover.
11. The Reinforced Soil Berm airspace volume is based upon the assumed construction of a 20-foot tall berm around Phases I through III.
12. The reclaimed unlined areas airspace volume is based upon the conservative assumption that only 50 percent of Phases II-B and II-C will be reclaimed.
13. For capping the access road, filling the valley, reclaiming unlined areas, and constructing a MSE Berm, the volume calculations are based upon an estimation of the possible volumes for these projects as these options have yet to be designed. An average waste acceptance rate of 48,412 lbs/year was calculated for the years 2011-2050 to use in these estimations. It was assumed a 1,600 lbs/cy waste density would be achieved.

# Landfilling is Expensive

- Equipment includes:
  - Tana E520 Landfill Compactor
  - Cat D6N Bulldozer
  - Volvo L-110 Wheel Loader
  - Cat 950 Wheel Loader
  - John Deere Excavator
  - Two 10-Wheel Dump Trucks
  - Komptech Shredder
  - Cat 252 Skidsteer Loader
- Other Expenses
  - Landfill Construction is about \$600,000/acre
  - Landfill Closure is about \$600,000/acre
  - Diesel Fuel Consumption
  - Personnel Costs
  - Environmental Monitoring/Maintenance
  - Leachate Management

# Tana E520 Landfill Compactor



# CAT D6N Bulldozer



# Volvo L110G Wheel Loader





# John Deere 120C Excavator



# Komptech Shredder



# Landfill Gas

- Landfill gas is presently collected and burned in a permanent flare
- COL received a NHDES Air Emissions Permit in February 2014 to install a landfill gas flare.
- Flare installed and operating January 2015.
- The next phase of landfill gas management is the development of a 1MW energy facility.

# Permanent Landfill Gas Flare



# Gas Collection (10,000 ft.) & Leachate Collection Piping



# Environmental Monitoring

29 Monitoring wells, 3X/Yr.



# New Recycling Baler



# Baled Cardboard and Baled Mixed Paper





# Mixed Plastic Container Bales



# Anyone Guess What These are?



# Steel Can Bale



# Aluminum Cans Bale



# Community Waste Reduction



# Annual Campaign

The screenshot shows the City of Lebanon website interface. At the top, there is a navigation bar with 'Sign In To MyDashboard' and social media icons for Facebook, Twitter, Instagram, and YouTube. Below this is the city logo and a menu with 'Your Government', 'Resident Resources', 'Business Resources', 'Life in Lebanon', and a 'How Do I?' button. A left sidebar contains icons for 'Agendas & Minutes', 'Forms & Permits', 'AskLebNH', 'Maps & Property Info', and 'Notify Me®'. The main content area features a breadcrumb trail: 'Home > Your Government > Departments > Public Works > Solid Waste & Recycling > Refill Not Landfill'. The page title is 'Refill Not Landfill'. The main text reads: 'In APRIL commit to REFILL, NOT LANDFILL. Reduce, REUSE, Recycle! During the month of April, we asked you to focus your attention on the Second "R" and look for opportunities to REUSE. Reusing items to shrink or eliminate the amount of waste that gets landfilled is becoming more important as we look to the future of waste disposal.' It then discusses the 'Taking the Refill NOT Landfill Pledge' by the Hanover Consumer Cooperative (the COOP), mentioning 'refillable/reusable prize packages' awarded in April. A logo for 'REFILL NOT LANDFILL' and 'COOP FOOD STORES' is displayed on the right. The text concludes with a thank you to the COOP and a note about the 2019 Refill Winners.

Sign In To MyDashboard

City Of  
**LEBANON**  
New Hampshire

Your Government Resident Resources Business Resources Life in Lebanon How Do I?

Home > Your Government > Departments > Public Works > Solid Waste & Recycling > Refill Not Landfill

## Refill Not Landfill

**In APRIL commit to REFILL, NOT LANDFILL**

Reduce, **REUSE**, Recycle! During the month of April, we asked you to focus your attention on the Second "R" and look for opportunities to REUSE. Reusing items to shrink or eliminate the amount of waste that gets landfilled is becoming more important as we look to the future of waste disposal.

**Taking the Refill NOT Landfill Pledge**

This year, the Hanover Consumer Cooperative ([the COOP](#)) sponsored our 2019 Refill NOT Landfill campaign by offering [refillable/reusable prize packages](#) that were awarded randomly each week during the month of April. Winners were selected from those who committed to REFILL by taking our online Refill NOT Landfill pledge.


The pledge drive is now closed but we wanted to thank all who participated by pledging to Refill NOT Landfill during the month of April. We hope you will continue to make a personal commitment to reuse, refill, and recycle all year long.

A very special thank you to the COOP for their extraordinary support and generous prize packages

We look forward to renewing our efforts next April.

**2019 Refill Winners**

Congratulations to the following people who were randomly chosen as winners in the 2019 Refill NOT Landfill campaign:



# Disposal Coffee Cup Reduction

- Community Project
  - Based on Community Conversations
  - More than 29 tons of coffee cups disposed in the Upper Valley
  - Multiple Upper Valley coffee shops to offer a coffee cup sharing option



# Contact Information

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- 370 Plainfield Road, West Lebanon
- Operating Hours are 8:30 A.M. to 5:00 P.M. M-F
  - Saturday 8:30 A.M. to 2:00 P.M.
- [www.lebanonnh.gov/solidwaste](http://www.lebanonnh.gov/solidwaste)