



AMHERST *Massachusetts*

OFFICE OF THE SUPERINTENDENT OF PUBLIC WORKS
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Department of Public Works

Fiscal Year 2007

This has been a very interesting year. The first part of the year found me finishing my deployment in Iraq, and the new Town Manager starting his contract here. The DPW found itself finishing up the projects we had lined up for the year while at the same time learning the ways of the new Manager. As always, the many individuals of the Department stepped up to the tasks at hand and did an excellent job. I would like to personally thank everyone for a job well done. Special thanks go to Bob Pariseau for filling in as the Acting Superintendent; to Jason Skeels and the engineers who were dragged into the Blum Brook athletic field project, which was not our project; and to John Field, who was kind enough to wait to retire until I got back to work.

John Field's retirement after 30 years working for the Amherst DPW is the first of 6-7 retirements the DPW is expecting over the next 3-5 years. I would like to thank John for his many years of service and wish him the best in retirement. John was replaced by Matt Loven, a 36-year veteran in the DPW as the Highway Superintendent. Matt Loven's supervisor's position was filled by Keith Longto, a 12-year veteran of the DPW.

Although it is sad to say good-bye to a long-time employee, John Field's retirement gave the General Fund side of the DPW some wiggle room during the creation of the FY 08 budget. By restructuring, and promoting qualified internal employees, the Highway Division was able to avoid laying off any employees for the upcoming budget year. We were actually able to hire a replacement Laborer.

As we close out my fifth year with the Town of Amherst, it will be remembered as our worst year fiscally. We did things this year we have never had to do and finished the year with less than \$2,000 and no stockpile of materials for the upcoming year. Employees responding to General Fund emergencies and required overtime after April were asked to flex their work hours or to take the overtime as compensatory time to save funds. Our employees were willing to do this, but using this approach on a routine basis in the future is something we hope to avoid. Payment for the FY 07 work has drifted into FY 08 as employees have used their additional time off in July and August. This year, divisions were directed to not purchase anything except materials for necessary work and repairs in April, instead of the last two weeks of June. Stock parts that were used during this period were not replaced at the end of the year. There were several weeks that potholes were not filled because there were no funds to pay for the labor and material.

The summer usually sees the hiring of several seasonal employees to support our work for LSSE, Parks and Commons, and our construction work. This year, only two seasonal employees were hired. This year saw a new user fee for the use of the facilities at Groff Park and Mill River – a

user fee which is being used to balance the program budgets of the LSSE Department instead of funding maintenance of the parks. Even the Water Fund suffered this year from a revenue shortfall as we adjust to the conservation efforts at UMass and to another wet spring and summer. We have put in place one of the largest water rate increases in the Fund's history and hope that only smaller increases will be needed in the future.

From FY 02 to FY 08, the General Fund DPW budget has gone from \$ 1,670,814 to \$1,690,501, a 1.16 % increase. The FY 08 budget is \$ 46,000 less than the FY 07 budget. The DPW had an unexpected salary savings of a little over \$20,000 from the Superintendent's sabbatical, in addition to around \$20,000 in savings from the Snow and Ice budget due to a mild winter. Both savings are not expected to be repeated again next year.

My letter is supposed to serve as a summary of the year and an introduction to the information to come. As always, our numbers look great, showing a department that is performing well in spite of budget reductions. I hope this introduction has stirred you to ask a few questions: Are we comfortable with funding employee positions out of the capital budget? This budget was supposed to carry us through the last four tight budget years before coming to an even split between major projects and improved routine maintenance. It seems now the tight years will continue. Are we doing all the routine maintenance we should be? Are the critical pieces being repaired as quickly and efficiently as they could be? What will the Department look like if it continues to receive annual increases of only 1.16% for the next six years? What skill level of employee will we be able to attract as the senior members of our work force retire? These are all valid questions as we review the past and think of the budget year ahead of us, with reduced funds.

In closing, I hope you find this information helpful and that you realize that what we accomplish is not due to one person. It is due to an entire department that is overall a very good group of employees who are willing to do their job, and a little more, to reach a common goal.

Respectfully submitted,

Guilford B. Mooring II, P.E.
Superintendent of Public Works

CONSTRUCTION AND MAINTENANCE

The personnel of the Highway Division, in addition to their normal maintenance, completed the following projects during FY 07:

HIGHWAY RESURFACING:

The following streets and roads were resurfaced, shimmed or reclaimed this year between July 2006 and November 2006 for a total of 1.4 miles. Over 1,800 ft. of sidewalk was repaved on each side of East Pleasant Street. Bike lanes and bus pull-offs were added, and drainage was also improved. The DPW also paved the parking lots of the Plum Brook Recreation Area and the Parks and Recreation Department Garage. In addition to the resurfacing work, DPW crews also installed approximately 800 tons of bituminous asphalt pavement patches.

<u>Reclamation & 3"Overlay</u>	From	To	Length (ft.)	Width (ft.)
Bay Rd.	Hulst Rd.	Town Line	3900	31
East Pleasant St.	Strong St.	Triangle St.	2630	38
Hulst Rd.	Bay Rd.	Brookfield Farm	800	20

SIDEWALK AND STORM DRAINAGE PROJECTS

Downtown Streetscape Improvements (Phase III) North Pleasant St.

The downtown sidewalk improvements continued this year, with the following work completed:

- new granite curbs 330 ft.
- new concrete sidewalk (8'wide) 85 cu.yds.
- sanitary sewer pipe 20 ft.
- stormwater drain structures 4 ea.
- new street lights & conduit 8 ea.

College Street Sidewalk Completion:

- granite curbing 700 ft.
- concrete sidewalk 380 ft. or 35 cu.yds.

Henry Street drainage and resurfacing project;

- new drainage pipe 2300 ft.
- drainage structures 30
- headwalls/ pipe outlets 8

OTHER PROJECTS:

1. new comfort station at Groff Park
2. roadway detail painting at intersections and parking lots
3. Ruxton Gravel Yard site reclamation work
4. repaired existing salt/sand shed
5. constructed new locker room for female employees
6. catch basin repairs 15
7. isolated pipe repairs 9
8. sewer repairs 4

TRANSPORTATION IMPROVEMENT PROGRAM (T.I.P.)

The following T.I.P projects are underway this year:

1. design of the Atkins Corner intersection improvements
2. University Drive corridor improvements
3. construction of Meadow Street bridge replacement (Mass Highway)
4. design of East Leverett Road bridge replacement (Mass Highway)
5. design of Main Street bridge replacement (Mass Highway).

SANITARY SEWER DIVISION

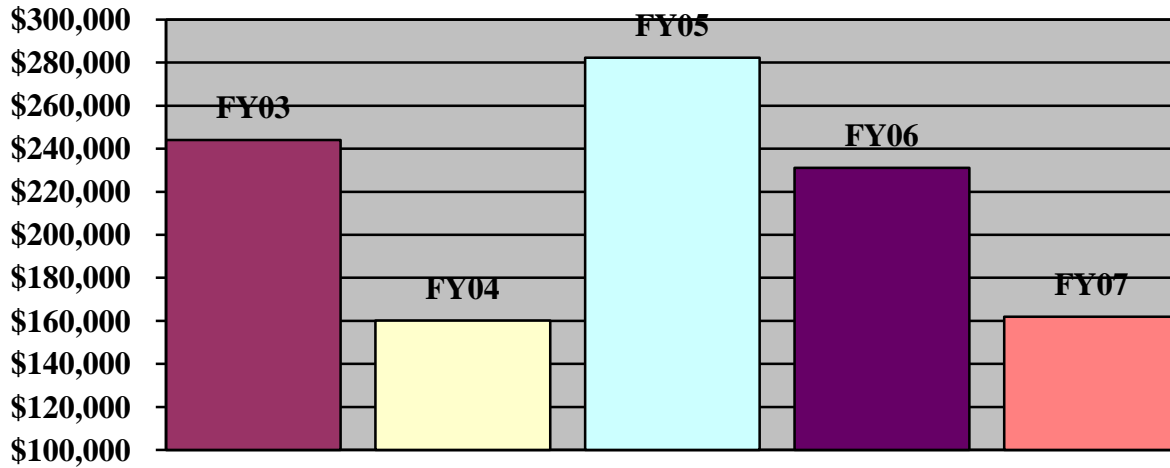
SEWER MAINTENANCE

Investigated **113** sanitary sewer complaints and corrected **21 stoppages** in the collection system. Problematic sewer locations are flushed and cleaned on a quarterly basis. The DPW, in conjunction with Dukes Inc., chemically treated 5617 feet of sewer line for root intrusion.

John Field/ Matt Loven
Highway Division Supervisor

SNOW AND ICE REMOVAL

Annual Expenditure

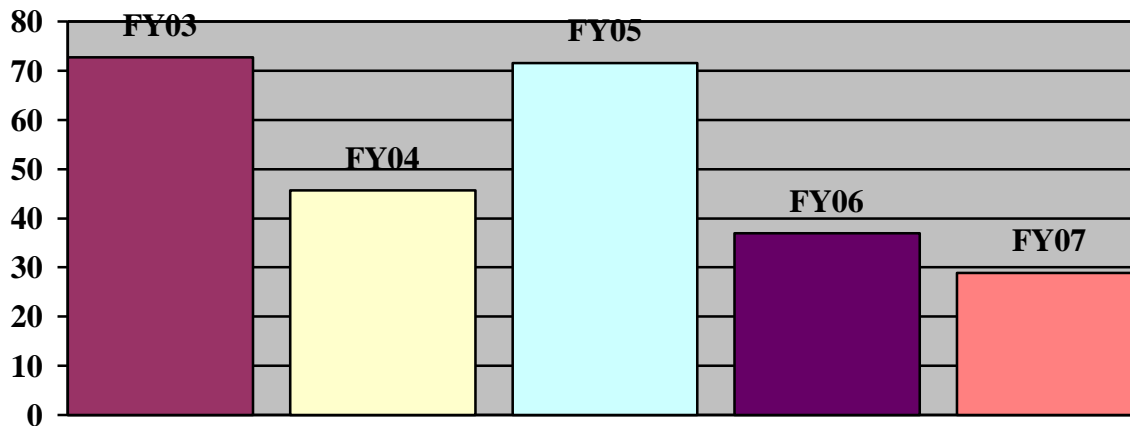


There were 15 snow and ice storms, with a total of 28.9 inches of snow.

2414 tons of sand and 808.15 tons of salt were used.

17505 gallons of Ice Band Magic were used on the roadways and sidewalks.

Inches of Snow



Year	Cost	Snow (inches)	No. of Storms
FY 03	\$243,986	72.7	39*
FY 04	\$160,181	45.7	27
FY 05	\$282,334	71.5	26
FY 06	\$231,120	36.9	20
FY 07	\$161,930	28.9	15

*7 Additional snow/ice events of less than 1" occurred, which required sanding operations only.

TREE AND CEMETERY DIVISION

The Tree Division removed a total of 82 street trees during the past year. Trees removed were: 8 red maple, 30 sugar maple, 8 Norway maple, 7 American elm, 7 white pine, 5 white ash, 3 poplar, 5 cherry, 1 magnolia, 2 hemlock, 1 catalpa, 1 butternut, 1 mountain ash, 1 weeping willow, 1 white willow and 1 black cherry.

During FY 07, 11 trees were planted.

38 tree stumps were removed in FY 07.

In addition to tree care responsibilities, this department, consisting of three full-time employees and one part-time summer employee, is also responsible for the care and maintenance, including burials, at the West, North and South Cemeteries.

Burials in FY 07

West Cemetery	2
North Cemetery	19
South Cemetery	12

PARKS DIVISION

The Parks Division of five full-time employees and two part-time summer staff continue the day-to-day maintenance of our parks and commons, together with the maintenance of twenty-three softball, baseball, football, lacrosse and soccer fields and many multi-purpose areas.

Special Projects:

No large special projects were worked on this year due to lack of funding.

WATER TREATMENT & DISTRIBUTION

Water Consumption: The average daily water consumption for FY 07 was 3.09 million gallons; the peak day, August 2, 2006, was 4.143 million gallons. The total FY 07 rainfall was 42.27 inches. In spite of an increase in the numbers of users, water consumption continues to show a decrease over the last 10 years, as shown in the graph below.

The figures below summarize the amount of water pumped, the revenue generated and the chemicals used to treat the water. Chlorine, ozone and ammonia are used for disinfection. Potassium permanganate is used for iron and manganese removal at Well #4. Polymer is used for water treatment at the Atkins and Centennial water treatment plants. Fluoride is added at a level of 1 part per million to reduce tooth decay, and sodium hydroxide is used to elevate the pH of the water for corrosion control.

DAILY WATER CONSUMPTION IN MILLION GALLONS

Water Services

	FY 05	FY 06	FY 07
New services installed	38	31	28
Total water services	6,338	6,369	6,428
# Meters Replaced	298	294	238

Chemical Usage - All Sites

Chlorine (lbs.)	16,998	15,976	18,659
Sodium Hydroxide (gals.)	16,253	14,225	15,171
Polymer (gals.)	2,528	2,289	3,189
Potassium Permanganate (lbs.)	694	1,924	393
Ammonia (lbs.)	3,537	3,079	3,266
Sodium Fluoride (lbs.)	21,900	17,275	19,180
Ozone	1,242	1,289	443

Monthly Pumping in Million Gallons

Month	FY 05	FY 06	FY 07
July	111.982	102.58	101.175
August	110.368	100.73	96.554
September	120.672	116.66	100.685
October	112.629	108.50	103.192
November	108.949	101.68	87.706
December	107.013	95.30	88.556
January	99.592	80.36	79.715
February	107.711	86.90	95.925
March	107.519	91.47	94.104
April	109.123	97.97	96.633
May	109.859	103.77	100.053
June	106.067	89.21	83.838
Total	1,311.48	1,175.13	1,128.14
Daily Average	3.59	3.22*	3.09*
Maximum Daily	4.533 (9/10/04)	5.128 (9/15/05)	4.143 (8/02/06)
Minimum Daily	2.532 (1/09/05)	2.043 (12/27/05)	2.241 (11/25/06)

Water Pumped - Million Gallons

<i>Source</i>	FY 05	FY 06	FY 07
Wells #1 & #2	142	103	167
Well #3	395	364	314
Well #4	78	191	44
Well #5	10	2	10
Pelham Reservoirs	283	231	316
Atkins Reservoir	404	284*	270*
Total Water Pumped	1,311	1,175	1,122
Average Daily (millions)	3.59	3.22	3.09

Quantity adjusted for meter error 200 gpm

Water Consumed – Cubic Feet

	FY 05	FY 06	FY 07
UMass	50,948,600	40,488,216*	36,835,279*
Amherst College	5,998,300	6,912,600	5,999,100
Hampshire College	3,028,400	3,071,000	2,667,300
Town	91,725,500	75,862,600	76,752,100
Municipal	1,293,000	1,037,500	1,172,300
Special Water Readings	476,900	326,700	8,751,000
Other	156,900	134,900	538,200
Un-Metered Use	5,000,000	5,000,000	5,000,000
Adjustments	1,184,700	356,500	756,600
Total Metered (ft³)	159,812,300	133,190,016	133,468,879
Total Metered (million gals.)	1,205*	999	1,001
% Unaccounted	8%	15%	10.8%

*Adjusted for meter error

Total Revenue – Dollars

	FY 05	FY 06	FY 07
UMass Water	\$1,112,074	\$806,313	\$797,273
Sewer	\$900,600	\$874,444	\$878,273
Amherst College Water	\$129,515	\$147,441	\$146,790
Sewer	\$117,016	\$165,965	\$159,548
Hampshire College Water	\$66,303	\$65,588	\$65,010
Sewer	\$59,065	\$73,730	\$71,618
Town Water	\$1,598,297	\$2,068,281	\$1,837,063
Sewer	\$1,375,642	\$2,168,192	\$1,813,176
Municipal Water	\$30,326	\$24,904	\$31,913
Sewer	\$25,139	\$24,802	\$32,057
Special Reading Water & Sewer	\$23,490	\$15,607	\$293,647
Adjustments Water & Sewer	(\$83,506)		(\$60,901)
Other Water & Sewer	\$6,001	\$6,492	\$29,991
Total Revenue	\$5,359,961	\$5,436,147	\$6,095,459

WATER QUALITY DATA:

Bacterial Samples: Bimonthly samples were analyzed from 27 sites around town and all samples were negative for coliform bacteria.

Fluoride: Fluoride was added to all sources at a level of 1.0 ppm to prevent tooth decay.

Treatment Plant Performance: Both the Atkins (Shutesbury) and Centennial (Pelham) Water Treatment plants produced water that meets the requirements set by the Environmental Protection Agency (EPA). The average turbidity from Atkins was 0.10 N.T.U. and from Centennial 0.08 N.T.U. The EPA requires that these readings be less than 0.3 N.T.U. in 95% of the samples. Total Trihalomethanes, a byproduct of chlorine disinfection, averaged 33.9 ppb from quarterly sampling at eight different sites around town. The EPA limit is 80 ppb. Haloacetic acids, another by product of chlorine disinfection, were also analyzed quarterly at 8 different locations and the average value was 39.1 ppm, well below the EPA limit of 60 ppm.

Water Rate: The water rate for FY 07 is listed below. In FY 07 the 3 tier ascending block rate was abandoned.

\$2.40 per hundred cubic feet

The average water cost to an Amherst resident, based on an annual usage of 120 HCF, is about \$288/year. This number is well below the state average.

Information: More information about water treatment and quality can be accessed on line at www.epa.gov or www.mass.gov; search for drinking water.

Cross Connection Program: The cross connection program was established in 1989 under Massachusetts Drinking Water Regulation 310 CMR 22.22 to prevent cross contamination of the water supply with hazardous substances. Water Department staff tests these devices twice annually.

Total Backflow Devices

	FY 05	FY 06	FY 07
<i>Town</i>	55	59	57
UMass	378	385	400
Amherst College	96	100	97
<i>Hampshire College</i>	25	28	30
Commercial	112	110	129
Residential-Irrigation		18	34
Total	666	700	747

Chemical Analysis: The following water tests were recently analyzed and all levels of substance in the water were below the Maximum Contaminant Level set by the Safe Drinking Water Act. More information is available online at www.amherstma.gov : Go to department – water – ccr.

- Volatile Organic Compounds – Solvents, Petroleum Products
- Inorganic Compounds – tested annually at all sources
- Fluoride – Daily at all sources
- Synthetic Organic Compounds – herbicides and pesticides - 2006 at all sources
- Arsenic
- Perchlorate
- Radioactive Substances
- Lead and Copper

SPECIAL ACTIVITIES

A. Water Pipeline Improvements: In FY 07, Freitas Construction, Inc. of Ludlow, Massachusetts, was contracted by the Town to do water distribution system improvements to Shays Street, at a cost of \$352,011.38. The work involved the abandonment of about 1 mile of old 6” cast iron water main and transferring 45 house services to another existing 12” water main. The old 6” main was causing consistent iron discoloration in the water.

B. Centennial Water Treatment Plant: The underground oil storage tank was replaced with an inside 500 gallon tank and spill containment. State grant funds assisted with the cost.

C. Atkins Water Treatment Plant: Tighe & Bond Engineers of Westfield, Massachusetts, updated the hardware and software control system at the plant.

D. Timber Harvest: In FY 07, 75 acres (compartment 13) of watershed land in Pelham were harvested by Northwoods Forest Products and generated \$25,133 of revenue.

E. Water Management Act permit renewal: The Massachusetts Department of Environmental Protection has begun a 5-year review of the Amherst Water Department’s “Water Management Act Permit.” We are currently approved for withdrawing 4.4 million gallons of water daily from our 5 wells located in Lawrence Swamp Aquifer. The permit evaluates such things as water conservation, pipeline leakage, water meter accuracy and per capita consumption.

F. Environmental Protection Agency Regulations: We are currently involved in sampling and ensuring compliance with the Federal Environmental Protection Agency Stage 2 Disinfection Byproducts Rule. The purpose of this regulation is to increase public health protection by reducing the levels of potentially harmful chemicals formed by the addition of chlorine to the drinking water. It appears that we can meet the more stringent requirements of this regulation without major changes to our current treatment plants.

G. Baby Carriage Brook: The greensand media used for iron and manganese removal in the well water was sampled and tested, and will be evaluated for chemical cleaning or replacement.

H. Dam Inspections: Tighe and Bond Engineers performed Phase I inspections on all Town-owned dams, as required by the Massachusetts Department of Conservation and Recreation. All dams were found to be in fair or satisfactory conditions, and the noted deficiencies will be addressed. Emergency Action Plans were developed for the two high-hazard dams: Atkins Reservoir and Factory Hollow.

I. Water Award: The Amherst water system was presented an award at the “National Drinking Water Day” held at the University of Massachusetts on May 10, 2007. This is the third year in a row that Amherst has been recognized by the Massachusetts Department of Environmental Protection for excellence in all aspects of water supply.

J. Fluoride Award: The Massachusetts Department of Public Health recognized the Amherst Water Department for successfully maintaining optimal fluoride levels and meeting the fluoridation monitoring requirements in 2007.

Robert E. Pariseau
Director of Water Resources

WASTEWATER TREATMENT PLANT

Flow Data

The Wastewater Treatment Plant treated 1.45 billion gallons of wastewater in FY 07. The highest daily flow rate recorded was 13.4 million gallons on 4/15/07.

	FY 05	FY 06	FY 07
<i>Inches of Rainfall</i>	47.84	56.98	42.26
Average Daily Flow in Million Gallons	4.21	4.42	3.97
Highest Day in Million Gallons	9.19 (1/14/05)	11.05 (10/15/05)	10.35 (4/16/07)
Chemicals Used			
Chlorine (lbs.)	11,575	9,480	9,535
Polymer (lbs.)	2,837	2,680	2,999
Potassium Permanganate (lbs.)	2,640	3,080	2,530

Chlorine is used to disinfect the wastewater prior to discharge into the Connecticut River. Polymer is used to thicken sludge as part of the disposal process. Potassium permanganate is used for odor control.

Treatment Efficiency

The water that is discharged into the Connecticut River is tested in our treatment plant laboratory. Many process control tests are performed to optimize treatment and produce the best quality effluent possible. The Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (DEP) monitor our activities and measure our effectiveness by the parameters listed below (annual averages). No violations of our EPA discharge permit occurred in FY 07.

Parameter	EPA Limit	FY 05	FY 06	FY 07
Biochemical Oxygen Demand (mg/L)	25*	13.0	4.4	6.0
Total Suspended Solids (mg/L)	30	3.2	3.1	4.0
Chlorination (mg/L)	1.0	0.44	0.44	.40

*Change from 30 in 2006

Septage Received

The treatment plant receives septage from residential septic tanks pumped from the towns of Amherst, Pelham and Shutesbury. Below is a summary of the number of septic tanks (usually 1,000 gallons) that were pumped.

Town	FY 05	FY 06	FY 07
Amherst	121	78	68
Pelham	44	40	40
Shutesbury	86	69	72
Total	251	187	180

Sludge Data

Sludge is the residual organic material left after the wastewater is treated. We currently thicken these solids on-site, and Casella Waste Management is under contract to deliver the liquid sludge to an EPA-approved sludge incinerator. Sludge in FY 07 was transported to three incineration facilities: Fitchburg, MA; Millbury, MA; and Naugatuck, CT.

Sludge Data	FY 05	FY 06	FY 07
Total Gallons (transported)	3,537,600	3,677,100	3,901,000
Total Dry Tons	1,030	1,011	1,052
% Solids	7.0	6.6	6.6

Month	Total Gallons	Ave. % Solids	Total Dry Tons	Dry Tons Per Day
July	198,000	7.0	58.41	1.9
August	189,000	7.7	60.55	1.9
September	326,500	6.8	92.47	3.1
October	420,000	6.6	114.83	3.7
November	383,200	6.2	99.09	3.3
December	411,200	5.4	91.46	3.0
January	258,000	6.7	71.85	2.3
February	351,800	6.1	89.48	3.2
March	406,900	6.2	103.51	3.3
April	365,900	7.1	108.68	3.6
May	383,500	6.6	104.71	3.4
June	207,000	6.6	56.96	1.9
Total	3,901,000		1,052.00	
Average	325,083	6.6	87.7	2.9

Power Consumption

	FY 05	FY 06	FY 07
<i>Avg. kWh/month</i>	104,300	115,563	102,272
Avg. kW Demand	?	232	214

Special Activities:

A. Discharge Permit: A new discharge permit was issued for the treatment plant in December 2006. Changes in the permit were a decrease in the effluent BOD limit from 30 mg/l to 25 mg/l (CBOD), and continued monitoring of nitrogen and phosphorus in the effluent. Nitrogen is a problem nutrient in Long Island Sound and a future nitrogen removal limit might be expected.

B. Demolition: Treatment plant staff demolished the original vacuum filter and conveyor that were used for sludge dewatering. The units had not been used in about ten years.

C. Emergency Power: Two new generators were purchased to supply emergency power at West Street (replacement) and Amherst Fields (new) pumping stations. Plant staff will install these units in the fall of 2007.

D. Roof at the Treatment Plant: Architect Roy Brown was hired to assist in preparing plans and specifications for a roof replacement at the 30-year old treatment plant. The work will be done in the fall of 2007.

E. Chlorination System: Treatment plant staff performed major updates and improvements to the chlorination-feed system.

F. Corrosion Control: Primary Clarifier #3 and four clarifier bridges were completely sandblasted and repainted.

G. Sewer Plans: DPW, Engineering, and GIS staff reviewed and did major improvements to the GIS sewer plans.

H. Sewer Rate: The sewer rate will go to \$3.00 per hundred cubic feet (750 gals) on 7/1/2007.

I. Electrical Department: The old administration building built in 1938 was converted to an electrical office, storage room and shop. Asbestos was removed from the facility heating system.

J. Comminutor: The raw wastewater grinder was replaced by treatment plant staff.

K. Sewer Rehabilitation: Old vitrified clay sewers were replaced on Sunset Court, McClure Street, Gaylord Street and Orchard Street. Three other chronic problem areas located on Hills Road, Red Gate Lane and Market Hill Road were repaired. The work was done in the fall of 2006 by Freitas Construction Inc. of Ludlow, at a cost of \$352,500. Camp, Dresser and McKee of Boston served as design and consulting engineer.

L. Water Reuse Project: The University of Massachusetts continued to utilize about 170,000 gallons daily of treatment plant effluent for make-up water at their existing power plant. The University will continue to use the treatment plant effluent when the new power plant goes on line in the spring of 2008. Expanded use of the treated effluent is expected in the future.

Robert E. Pariseau
Director of Water Resources