TESTIMONY

of

PAUL GADOURY

before the

PUBLIC UTILITIES COMMISSION

FOR

GENERAL RATE RELIEF

for

PROVIDENCE WATER

March, 2007

PROVIDENCE WATER SUPPLY BOARD
TESTIMONY OF
PAUL GADOURY

Q. Please state your name and your position?

A. Paul Gadoury, Director of Engineering for the Providence Water Supply Board (Providence Water).

Q. How long have you been employed by Providence Water and held this position?

A. I have been employed since April of 1974 or approximately 33 years. I have held the position of Director of Engineering since November of 1990.

Q. Would you please state your education and professional background?

A. I graduated Magna Cum Laude from the University of Rhode Island in 1971 with a Bachelor's Degree in Civil Engineering. I am a Registered Professional Engineer in both the State of Rhode Island and the Commonwealth of Massachusetts. My background includes experience in the construction industry and 33 years in the field of water supply engineering with Providence Water.

Q. Please explain your duties and responsibilities.

A. My duties involve the oversight and direction of all engineering activities at Providence Water, including operational engineering and engineering records maintenance activities, expansions to the system including new customer tie-ins and system additions, and the planning and implementation of Providence Water's

Capital Improvement (CIP) and Infrastructure Replacement (IFR) Programs.

Q. What issues are you addressing in this testimony?

A. Addressed in this testimony will be 1) modifications that we are finding ourselves having to make in the scope of some of our major infrastructure replacement (IFR) projects along with the increased costs associated with those modifications; 2) the impact that fluctuations in weather conditions have on the annual water use from our system in any given year from which we depend upon to meet our revenue requirements.

Infrastructure Replacement Plan

Q. Is Providence Water proposing changes to its currently approved Infrastructure Replacement Plan?

A. Yes. Providence Water is presently engaged in two major IFR projects whose scope of work has been significantly expanded beyond that originally envisioned at the time of the preparation of our currently approved Plan, and has also modified its expected approach to another significant future treatment plant project within the Plan.

In April 2006 we filed a balanced 20-year IFR Plan with the RI Department of Health which is the legislatively appointed approving agency for these plans. The plan was

filed based on the best information that we had available at the time of its preparation concerning projected infrastructure replacement needs of the system over the 20 year planning period. The Plan outlined $65,550,000 in IFR improvements over the first 5 years of the program and $182,875,000 million over the ensuing 15 year period for a total investment of $248,425,000 over the 20 year span of the program. On February 7, 2007 RIDOH granted its full approval of the Plan as it was submitted.

Since that time, it has become necessary for us to make some significant adjustments to the scope of the following projects within the approved Plan:

(a) Significant expansion and immediate acceleration of our original plans for the replacement of lead services.

(b) Expansion of the originally envisioned scope of work for our Water Treatment Plant Filter Rehabilitation project presently under design.

(c) Modification of our expected approach to our future planned project for the rehabilitation of our sedimentation basins.

Q. Please explain why there is a need for accelerating the replacement of lead services?

A. Approximately 25,600 or 36% of the service lines in our system are lead. It has always been our goal to

eliminate lead services from our system by replacing them with new service lines. In pursuit of this, we had made the replacement of a significant portion of these lines a major component of our IFR Plan. Due to the competing need for IFR funds of our planned filter improvements over the first 5 years of the program, we had limited our planned investment into lead service replacements over that time span to $.5 million. Over the ensuing 15 year period of the plan, we significantly increased this with $41.5 million in lead service replacement work being planned.

These plans have now been significantly altered by the issuance to us, based on our latest lead level sampling results, of a regulatory order mandating an accelerated schedule for lead service replacements in accordance with the requirements of the federally legislated Lead and Copper Rule. The Lead and Copper Rule, under EPA enforcement, requires certain standards to be met concerning lead levels at consumers' water taps within their homes. The legislation mandates certain response actions to be taken by water utilities when more than 10% of "first draw" samples taken from selected home test sites exceed a level of 15 parts per billion (ppb). Providence Water had been remaining below this lead "action level" since the implementation of the Lead and Copper Rule back in 1991. In August 2006, however,

Providence Water sampling results exceeded this limit. According to legislative and regulatory requirements, this now triggered a mandatory action response whereby, effective September 2006, Providence Water is now required to replace 7% of its lead services or 1,792 lead services annually.

Q. What is the projected cost impact of this accelerated replacement schedule relative to what had been presented in the IFR plan?

A. This lead service replacement mandate has a substantial cost impact on our program. In our currently approved 20-year IFR program we had $42 million targeted for lead service replacement work. It was estimated that this would have replaced somewhat less than half of the lead services in our system. The mandate that we must now replace all of our 25,600 lead services over the next 15 year period increases the cost of lead service replacements from our originally planned $42 million over the next 20 years to an estimated $90 million over the next 15 year period. It has particularly severely impacted the next four years of our IFR program (2007 through 2010) where we had previously allocated $400,000 for lead service replacement work but are now faced with instead having to do $21 million worth of service replacements over that same time period.

Q. **Concerning the Treatment Plant Filter Rehabilitation project, please explain why the original scope of the project is being changed.**

A. One of the major IFR projects still remaining to be done at our treatment plant is the rehabilitation of the plant's filters. The plant's 18 filters, consisting of 36 paired filter beds, perform one of the most critical steps in our treatment process which is also the final treatment step before finished drinking water exits the plant. All of the filters, with the exception of two which have undergone more recent rehabilitation, date back to their original installation at the time of the plant's construction in the 1920s or to the later plant expansions that took place in the 1940s and 1960s. With the exception of the two recently upgraded filters, all of the filters are utilizing sand as the filtration media, and a system of antiquated perforated pipe laterals embedded in gravel as the filtrate underdrain collection system. Included in our IFR program were plans to rebuild all of these filters over the next six year period at an estimated cost of $25 million, with the improvements consisting essentially of replacing the mono-media sand systems with new anthracite/sand dual-media beds, installing new low profile non-gravel underdrain systems, air-scour backwashing, and filter-to-waste capabilities. Included also in the project were significant associated modifications and improvements to

the piping, valves, metering, and control systems associated with the filtration process, as well as repairs to the below grade concrete slab roofs of the filters to attempt to seal out the leakage of rainwater and groundwater into the filters.

A contract for the design work for these improvements was issued in October 2006. Under this contract, as part of the evaluation of the existing filter systems, it was uncovered that the present structural configuration of the filter beds precluded their being able to be brought up to modern design standards relative to recommended minimum depths of filter media to be used in the filtration process. The consultant identified, for our consideration, more substantial modifications to the filters than had originally been envisioned which, in addition to enabling us to increase the depth of the filter media to acceptable design standards, provides other benefits including, importantly, the flexibility and opportunity for the future incorporation of granular activated carbon (GAC) into our filtering process.

Q. Could you please summarize the modifications that need to be made to accomplish this?

A. In summary, the proposed change would require much more extensive structural modifications to the filters, including the demolition of the multiple existing cast-

in-place concrete filter troughs within each filter and the construction of new troughs at a higher elevation. Increasing the depth of the filters in this manner would also require that the existing below-grade underground filter roof slabs be demolished and removed and that new building structures be constructed over the filters.

Q. **Could you explain why Providence Water believes these enhancements are worth the additional investment?**

Providence Water management fully supported implementing these enhancements beyond the originally envisioned project as it offers numerous benefits:

(a) Allows us to increase the depth of the filters in order to be able to meet today's recommended filter design standards concerning the minimum depth of filtration media to be used for filtering, a depth which could not otherwise be met.

(b) Provides the filter bed depth needed to utilize GAC filter media in the future, providing us with the opportunity to take advantage of its superior filtration performance and taste and odor removal capabilities.

(c) Does away with the present undesirable configuration of the filters whereby most of the filter media surface is hidden underground from view, a condition which is completely contrary to today's filter design standards and operating

recommendations for full visual capability for observation and monitoring of the entire filter bed surface. Under the proposed modifications, the entire filter surface would be open and accessible for visual monitoring, performance troubleshooting, and maintenance.

(d) Greatly simplifies and facilitates the process of removing and replacing filter media for scheduled media change-outs or repair purposes.

(e) In addition to providing improved access, the construction of new above-grade building structures over the filters effectively eliminates the problem which has long plagued the filters with rainwater and groundwater infiltrating into them through their underground roof slabs.

A presentation was made to the Board of Providence Water of the proposed modification to the project and its cost impact. At its December 2006 meeting, the Board looked favorably towards the benefits of the expanded project scope and voted to adopt these enhanced improvements to the filter upgrade project.

Q. What are you projecting the cost impact to be of these expanded improvements to the filter project?

A. These improvements to the project have been projected to add approximately $15 million in design, construction,

and inspection costs to the previously estimated cost for the project of $25 million over the project's six year implementation period.

Q. Finally, what is the IFR change related to the future project for the rehabilitation of the plant's sedimentation basins?

A. The sedimentation basins at the plant consist of two large open water surface basins, each with water surface areas of approximately 10 acres and 26 acres respectively, through which water flows after having been first treated with a chemical coagulant to promote the settling out of impurities. These basins were part of the plant's original construction back in the 1920s. The sides of the basins are bounded with concrete walls and the bottoms lined with a series of individual concrete slabs. Water is meant to travel slowly in series through the two basins to provide detention time for particles to settle out to the bottom. Every few years, the basins need to be drained for the thick layer of "sludge" which has accumulated along the bottom to be removed. The massive areas of concrete walls and slabs making up the basins have deteriorated significantly over time and initially our IFR plans were to renew the basins through extensive concrete rehabilitation work, including the restoration or reconstruction of the expansive concrete bottom slabs and the possible installation of additional

interior flow baffling.

In light, however, of the outmoded nature of this sedimentation process by today's standards, we have reconsidered this approach. Basins of this type would not be designed or constructed today for this type of application. They are not as efficient in removing impurities as modern settling methods, their open and exposed top water surfaces increase the chances of contamination, and the accumulation of sludge deposits within the basin bottoms can result in problems where under certain conditions high levels of manganese can be released into the water which, in contrast to our present sand filters, GAC filtration has difficulty removing. Sludge removal from these types of basins is also a very messy and labor intensive process during which time the basins need to alternately be taken off line for periods of time.

In light of our plans to potentially switch to GAC filtration in the future, and the outmoded nature of this type of settling basin approach, Providence Water has decided that a new modern and better performing settling system should be installed in their place. While the settled sludge from such a system would still need to flow to our sludge lagoon system for handling and disposal as is done at present, the mechanism of removing

sludge from the treatment plant settlers would be greatly simplified through use of an automatic and ongoing mechanized sludge removal process that would eliminate the problems of the sludge buildup and the burdensome cleaning and sludge handling requirements associated with the current basin system. This project is slated in our Plan to commence some time past the year 2010, and is at this point conceptual in nature only. Compared to our previous estimated costs of $10 million for rehabilitation of the existing basin structures, treatment plant design professionals with experience in this field have identified to us the cost of such a system potentially being on the order of $30 million when combined with associated plant modifications necessary to incorporate such a system into the current treatment process. Pending the refinement of these figures as plans become more specific, we have utilized this revised cost estimate in the adjustment to our plan.

Q. Is Providence Water submitting an amended IFR plan to RIDOH to reflect these changes?

A. Yes. We are submitting an amended plan to RIDOH for their review and approval that will outline these changes in the scope of the projects and their associated costs to the plan.

Q. How is Providence Water planning to fund this modified

IFR program?

A. We are proposing to fund the program through a combination of bond issues and an increase in IFR restricted rate revenue. Our Finance Director Jeanne Bondarevskis explains this in her testimony and supporting information.

Water Demand Variability

Q. What is the issue of water demand variability mentioned earlier in this testimony?

A. The issue that we want to point out is the significant degree to which the water demand from our system is influenced annually by weather conditions. In fact, the weather pattern of the summer months has a larger influence on our annual demand in any given year than any other factor. As the majority of our revenue is based on the volume of water we sell, these weather dependent demand variabilities create what can be a significant uncertainty in the annual revenue that we can expect to collect on a year-to-year basis.

Exhibit PG-1 which shows a plot of the average demand over the three month June-July-August periods of the past 10 years illustrates the frequency and magnitude of these variations in summer demand from year to year. The weather summaries at the top of the chart demonstrate the correlation of these demand variabilities with the

weather conditions experienced during those months of the particular years. These weather summaries have been simplified, with the various months being categorized as dry or wet and hot or cool based simply on whether the rainfall and average temperature were above or below the long term historical averages for those months. The degree of departure from average temperatures and rainfall, as well as the distribution of those events during a given month would of course affect the degree of influence of those factors on the water demand. Nevertheless, the data shows a most clear correlation between weather influences and summer water demand.

By contrast, Exhibit PG-2 is a plot showing the average daily demand over the November through March periods of the same years, a time during which weather conditions are not expected to be a factor. As can be seen, the demand over these periods does not show much year-to-year fluctuation. In comparison with the fluctuating summer demands, these non-weather influenced demands are shown to be fairly stable on a year-to-year basis.

The influence of the variable and unpredictable summer demand on the overall demand for the entire year is shown in Exhibit PG-3. Exhibit PG-3 is a plot of the average annual demand on our system over the full course of the year during each of the past 10 years. As can be seen,

there are significant up and down variations in the total demand from year to year.

Comparing Exhibit PG-1 and Exhibit PG-3, it is clearly seen that the variable weather-dependent demands over the summer periods have a significant impact on the ultimate volume of water sold in any given year, with a corresponding impact on rate revenues. This being the case, Providence Water must each year run its operation with a degree of uncertainty of how much revenue to expect.

Q. Is Providence Water making any proposals in this filing to address this annual demand and revenue uncertainty?

A. Yes. We are proposing a rate structure that would be less affected by this demand variability. Inasmuch as a large proportion of our costs remain the same irrespective of the quantity of water consumed, we are proposing a rate structure where the demand dependent portion of our revenue would at least more closely correlate with our demand dependent costs. Our Finance Director, Jeanne Bondarevskis, addresses this in detail in her testimony and supporting rate filing documentation.

Q. Does this conclude your testimony?

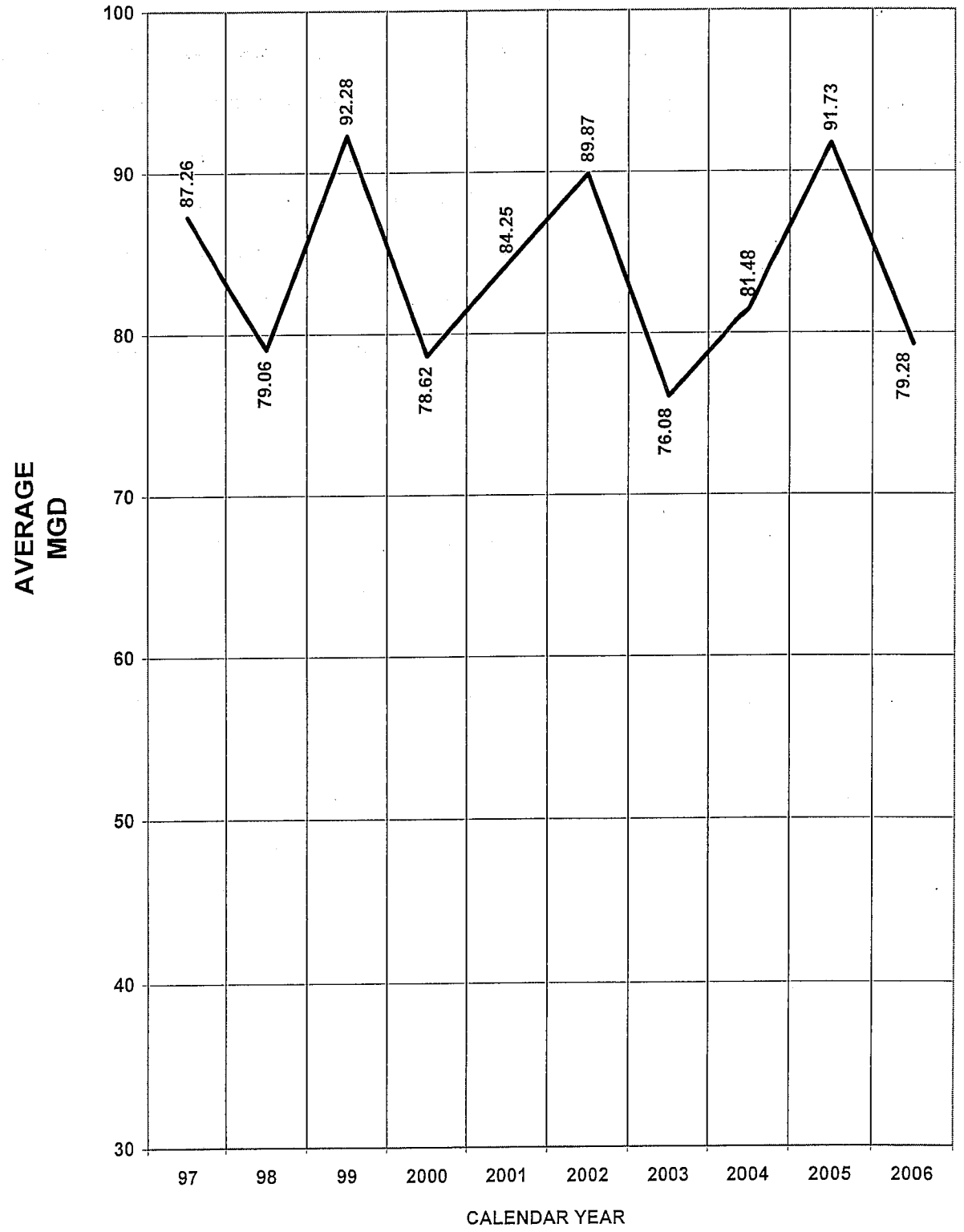
A. Yes.

EXHIBT PG - 1

Providence Water

SUMMER PERIOD SYSTEM DEMAND*
(June - July - August)

	SUMMER WEATHER									
CALENDAR YEAR	97	98	99	2000	2001	2002	2003	2004	2005	2006
Jun	Dry/Hot	Wet/Cool	Dry/Hot	Wet/Hot	Wet/Hot	Dry/Cool	Wet/Cool	Dry/Cool	Dry/Warm	Wet/Warm
Jul	Dry/Hot	Dry/Hot	Dry/Hot	Wet/Cool	Dry/Cool	Dry/Hot	Dry/Hot	Wet/Cool	Dry/Warm	Dry/Warm
Aug	Wet/Cool	Dry/Hot	Dry/Hot	Wet/Cool	Wet/Hot	Dry/Hot	Dry/Hot	Wet/Cool	Wet/warm	Dry/Warm
% Normal	101%	149%	46%	120%	130%	55%	101%	106%	60%	144%



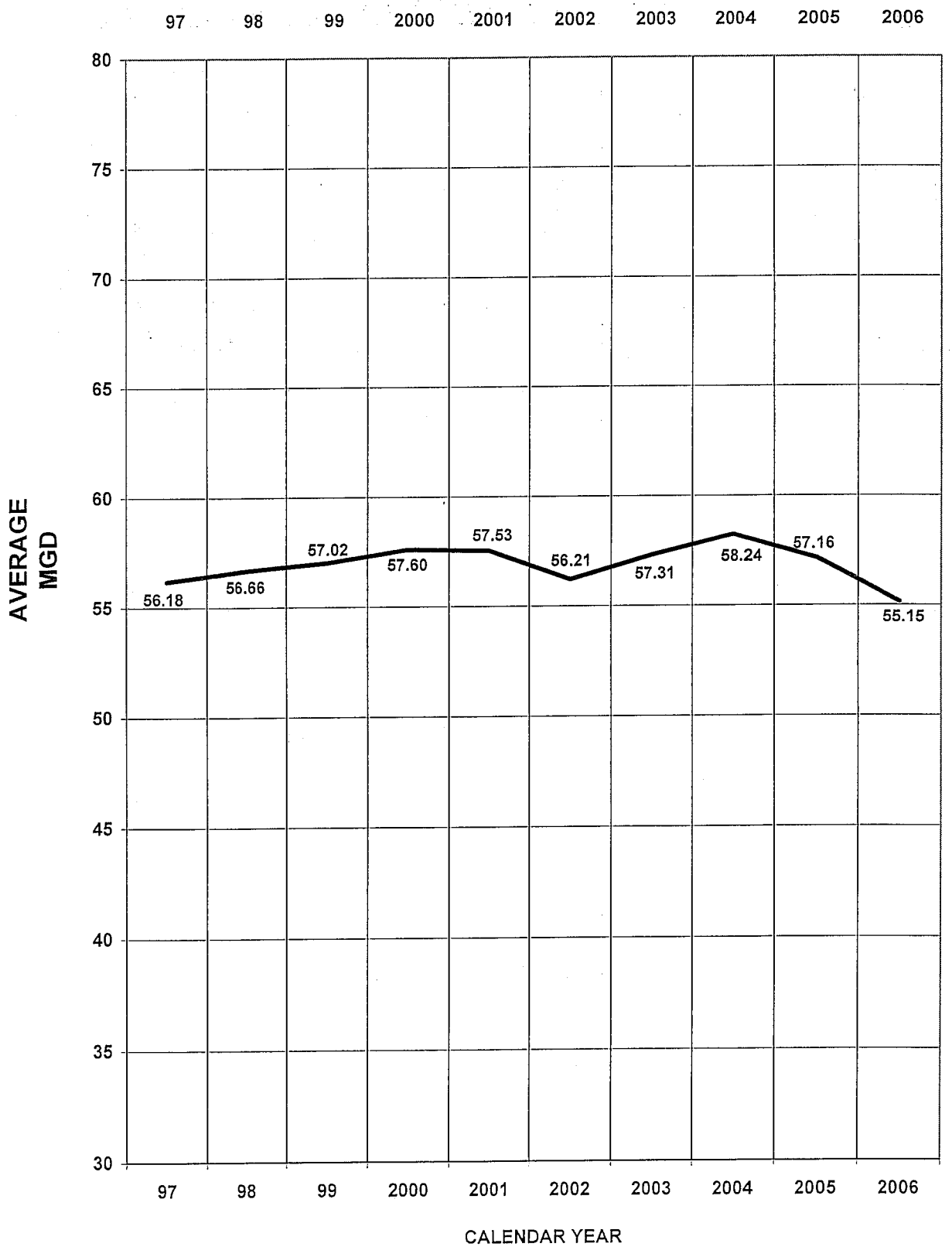
* Not including Bristol County.
MGD = Million gallons per day.

EXHIBT PG - 2

Providence Water

WINTER PERIOD SYSTEM DEMAND*

(November Thru March)



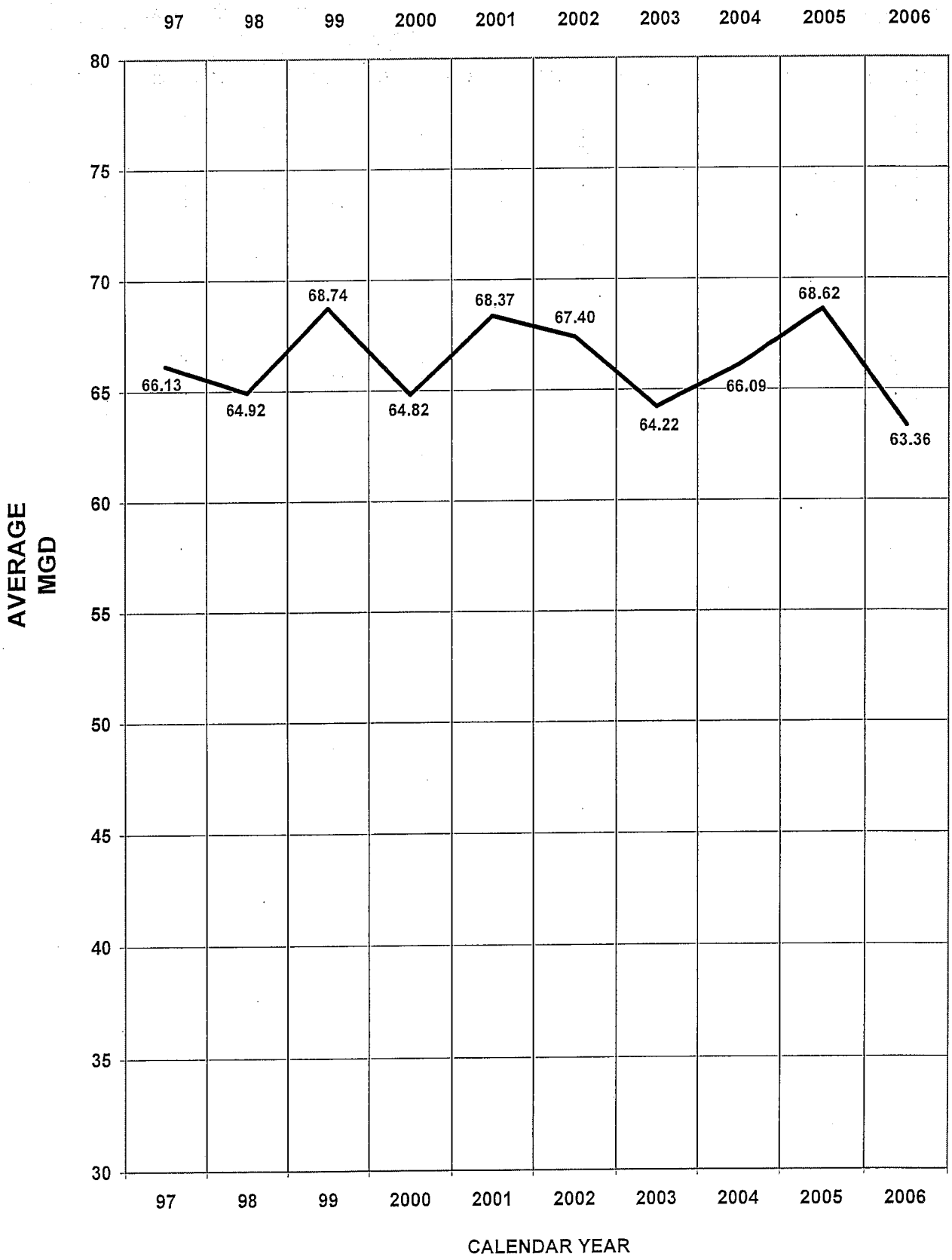
* Not including Bristol County.

MGD = Million gallons per day.

EXHIBT PG - 3

Providence Water

ANNUAL SYSTEM DEMAND*



* Not including Bristol County.
MGD = Million gallons per day.