

**PORT OF HOUSTON AUTHORITY RESTATED
RETIREMENT PLAN**
REPORT OF AN ACTUARIAL AUDIT

Final Audit Report in Accordance with Section 802.1012(h) of the Texas Government Code

AUGUST 16, 2012

August 16, 2012

Mr. Thomas J. Heidt
V.P. of Finance and Administration
Port of Houston Authority
111 East Loop North
Houston, Texas 77029

Re: Final Audit Report in Accordance with Section 802.1012(h) of the Texas Government Code

Dear Mr. Heidt:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the August 1, 2011 Actuarial Valuation of the Port of Houston Authority Restated Retirement Plan (the Plan). The following documents are intended to demonstrate that the Port of Houston Authority (PHA) has complied with Section 802.1012 of the Texas Government Code which requires an actuarial audit of public retirement systems with total assets of at least \$100 million.

The following three documents will constitute the final audit report, as required by Section 802.1012(h) of the Texas Government Code:

1. This cover letter,
2. Preliminary draft of the audit report, dated July 13, 2012, and
3. PHA response to the preliminary draft of the audit report, dated August 15, 2012.

As requested by GRS, PHA management provided an initial response to the preliminary draft of the audit report on July 31, 2012. The preliminary draft of the audit report and the initial response by PHA management were then presented to the full Port Commission on August 7, 2012 for additional comments. Based on feedback from the Commissioners, PHA provided a final response on August 15, 2012.

GRS is pleased to report to PHA that, in our professional opinion, the August 1, 2011 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of the Plan.

I am an Enrolled Actuary, a Fellow of the Society of Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



R. Ryan Falls, FSA, MAAA, EA
Senior Consultant

**PORT OF HOUSTON AUTHORITY RESTATED
RETIREMENT PLAN
REPORT OF AN ACTUARIAL AUDIT**

Preliminary Draft in Accordance with Section 802.1012(f) of the Texas Government Code

JULY 13, 2012

July 13, 2012

Ms. Maxine N. Buckles
Corporate Controller
Port of Houston Authority
111 East Loop North
Houston, Texas 77029

Dear Ms. Buckles:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the August 1, 2011 Actuarial Valuation of the Port of Houston Authority Restated Retirement Plan (the Plan). We are grateful to the Port of Houston Authority (PHA) staff and Milliman, the retained actuary, for their cooperation throughout the actuarial audit process.

This actuarial audit involves an independent verification and analysis of the assumptions, procedures, methods, and conclusions used by the retained actuary for PHA, in the valuation of the Plan as of August 1, 2011, to ensure that the conclusions are technically sound and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board.

GRS is pleased to report to PHA that, in our professional opinion, the August 1, 2011 Actuarial Valuation prepared by the retained actuary provides a fair and reasonable assessment of the financial position of the Plan.

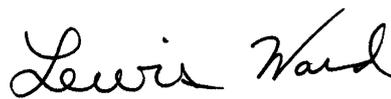
Throughout this report we make a number of suggestions for ways to improve the work product. We hope that the retained actuary and PHA find these items helpful. Thank you for the opportunity to work on this assignment.

Mr. Falls is an Enrolled Actuary, a Fellow of the Society of Actuaries, and a Member of the American Academy of Actuaries. He meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



R. Ryan Falls, FSA, MAAA, EA
Senior Consultant



Lewis Ward
Consultant

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SECTION I

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Port of Houston Authority (PHA) issued a Request for Proposal (RFP) for an audit of the August 1, 2011 Actuarial Valuation of the Port of Houston Authority Restated Retirement Plan (the Plan) performed by the retained actuary. PHA selected Gabriel, Roeder, Smith & Company (GRS) to perform the actuarial audit. The project commenced in June of 2012.

This Actuarial Audit includes the following:

- Review and analysis of the calculation results, including an evaluation of the data used for reasonableness and consistency as well as a review of the mathematical calculations for completeness and accuracy.
- Verification that all appropriate benefits have been valued and valued accurately. Verification that the data provided by PHA is consistent with the data used by the retained actuary.
- Evaluation of the actuarial cost method and the actuarial asset valuation method in use and whether other methods may be more appropriate for PHA.
- Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability and the amortization period used under the actuarial cost method.
- Review the demographic and economic actuarial assumptions for consistency, reasonableness and compatibility. Such assumptions shall include, but are not limited to: mortality, retirement and separation rates, levels of pay adjustments, rates of investment return and disability factors.
- Assessment of the adherence to Actuarial Standards of Practice (ASOPs) published by the American Academy of Actuaries.
- A full replication of the August 1, 2011 actuarial valuation results was not covered under the scope of this engagement.

This actuarial audit will satisfy the requirements of Section 802.1012 of the Texas Government Code which requires an actuarial audit of public retirement systems in Texas with total assets of at least \$100 million.

Summary of Findings

Based on our review, the actuarial valuation, studies, and reports of the Plan are reasonable, used appropriate assumptions, and complied with actuarial guidelines. We offer the following recommendations based on the valuation methods and assumptions used by the retained actuary in the August 1, 2011 actuarial valuation.

Actuarial Assumptions

- The next experience study issued by the retained actuary should contain more detail regarding the approaches considered and justification for the assumptions proposed.
- In the next experience study, the earnings progression assumption, rates of withdrawal, and rates of retirement should be studied in more detail.

Actuarial Methods and Funding Policy

- We recommend an adjustment to the application of the actuarial cost method. The implementation of this method for PHA should not have a material impact on the valuation results, but would provide a more accurate representation of the normal cost as a percentage of pay which portrays the relative cost of the plan. It should be noted that we believe the total present value of benefits was determined in a reasonable manner.

Actuarial Valuation Results

- We recommend that the value of the Late Retirement Benefit be incorporated into the actuarial valuation so that the value of the Late Retirement Benefit is funded over the course of the participant's career.

Content of Valuation Report

- The retained actuary should review the recommendations made in Section VI regarding the actuarial valuation report.

SECTION II

GENERAL ACTUARIAL AUDIT PROCEDURE

GENERAL ACTUARIAL AUDIT PROCEDURE

At the commencement of this engagement, GRS requested the information necessary to thoroughly review the work product of the retained actuary. Specifically, GRS received and reviewed the following items:

- Actuarial reports as of August 1, 2010 and August 1, 2011,
- The most recent experience study dated August 4, 2010,
- A full set of census data for plan participants and beneficiaries as of August 1, 2011,
- The Plan's Statement of Investment Objectives and Policy, dated January 24, 2012,
- Port of Houston Authority Restated Retirement Plan, executed April 24, 2012,
- Summary Plan Description (SPD), dated September 29, 2010, and
- Detailed calculations from the retained actuary for a sampling of 30 plan participants as of August 1, 2011.

In performing our review, we:

- Reviewed the plan document and the SPD to understand the benefits provided by the Plan,
- Reviewed the appropriateness of the actuarial assumptions,
- Reviewed the actuarial valuation reports, and
- Reviewed the detailed liability calculation of the 30 sample lives to ensure that the calculations were consistent with the stated plan provisions, actuarial methods and assumptions.

The entire review, which follows, is based on our review of this information and subsequent correspondence with the retained actuary for clarification and further documentation.

Key Actuarial Concepts

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement plan using the set of actuarial assumptions adopted by the plan sponsor. It is designed to simulate all of the dynamics of such a retirement plan for each current participant of the plan, including:

- Accrual of future service,
- Changes in compensation,
- Leaving the plan through job change, disablement, death, or retirement, and
- Determination of and payment of benefits from the plan.

This simulated dynamic is applied to each active participant of the plan. This simulation results in a set of expected future benefit payments to that participant. Discounting those future payments for the likelihood of survival and at the assumed rate of investment return, produces the Total Present Value of Plan Benefits (TPV) for that participant. The actuarial cost method will allocate this TPV between the participant's past service (actuarial accrued liability) and future service (future normal costs).

These key actuarial concepts will be discussed in more detail throughout this report.

SECTION III
ACTUARIAL ASSUMPTIONS

ACTUARIAL ASSUMPTIONS

Overview

The actuarial valuation report contains a description of the actuarial assumptions which were used in the actuarial valuation as of August 1, 2011. Additionally, the retained actuary published an actuarial experience report, dated August 4, 2010. We have reviewed this detail in order to assess the reasonableness of the assumptions used in the actuarial valuation.

The set of actuarial assumptions is one of the foundations upon which an actuarial valuation is based. An actuarial valuation is, essentially, a statistical projection of the amount and timing of future benefits to be paid under the retirement plan. In any statistical projection, assumptions as to future events will drive the process. Actuarial valuations are no exception.

It is important to understand the nature of the retirement plan and the plan sponsor when assessing the reasonableness of the actuarial assumptions. No projection of future events can be labeled as “correct” or “incorrect”. However, there is a “range of reasonableness” for each assumption. We evaluate individual elements as follows:

- Whether or not they fall within the range of reasonableness, and
- If they fall within that range, whether they are reasonable for the actuarial valuation of the plan.

Actuarial assumptions for the valuation of retirement plans are of two types: (i) demographic assumptions, and (ii) economic assumptions. We have assessed the reasonableness of both types as part of this actuarial audit.

Demographic Assumptions

General

These assumptions simulate the movement of participants into and out of plan coverage and between status types. Key demographic assumptions are:

- turnover among active participants,
- retirement patterns among active participants, and
- healthy retiree mortality.

In addition, there are a number of other demographic assumptions with less substantial impact on the results of the process, such as:

- disability incidence and mortality among disabled benefit recipients,
- mortality among active participants,
- distribution of option selection, and
- percent of active participants who are married and the relationship of the ages of participants and spouses.

Demographic assumptions for a retirement plan such as PHA are normally established by statistical studies of recent actual experience, called experience studies. Such studies underlie the assumptions used in the valuations.

Once it is determined whether or not an assumption needs adjustment, setting the new assumption depends upon the extent to which the current experience is an indicator of the long-term future.

- Full credibility may be given to the current experience. Under this approach the new assumptions are set very close to recent experience.
- Alternatively, the recent experience might be given only partial credibility. Thus, the new assumptions may be set by blending the recent experience with the prior assumption.
- If recent experience is believed to be atypical of the future, such knowledge is taken into account.
- Finally, it may be determined that the size of the plan does not provide a large enough sample to make the data credible. In such cases, the experience of the plan may be disregarded and the assumption is set based upon industry standards for similar groups.

The measurement of experience is normally affected by simply counting occurrences of an event. Thus, for example, in reviewing retirement patterns, an actuary might count the number of actual retirees among males aged 55 with 30 years of service. These retirements would be compared against the number of total people in that group to generate a raw rate of retirement for that group.

Experience Study Report

The experience study report, dated August 4, 2010, states the prior and proposed assumptions as well as the impact of the changes on the actuarial valuation. However, the experience study report provides very little basis for the retained actuary's reasoning in developing the proposed assumptions.

Actuarial Standard of Practice (ASOP) No. 41, Actuarial Communications, requires that the methods, procedures, assumptions, data, and other information required to complete the work be included in all Actuarial Communications. The information provided in the experience study report does not meet the requirements of this ASOP.

A presentation style that shows the exposure, the present and proposed decrement rates, and the expected results under the present and proposed decrement rates in a single chart are generally standard in experience study reports. An example of a preferred schedule from an unrelated experience study would be:

Sample Withdrawal Experience of Active Participants 2004-2009

Age	Withdrawal	Exposure	RATES			EXPECTED WITHDRAWALS	
			Crude	Old	New	Old	New
20-24	1	25	0.040	0.096	0.090	2	2
25-29	15	152	0.099	0.086	0.090	13	14
30-34	15	232	0.065	0.070	0.065	16	15
35-39	14	410	0.034	0.030	0.034	12	14
40-44	17	516	0.033	0.027	0.033	14	17
45-49	15	570	0.026	0.025	0.025	14	14
50-54	14	457	0.031	0.023	0.025	11	11
TOTALS	91	2,362	0.039	0.083	0.080	82	87

This type of presentation has several advantages:

- (1) A reader can judge if the “exposure” is approximately correct. This exposure number is fundamental to the entire process, and we believe that it should be shown. For a five year study, for example, each person is exposed once each year, so the exposure at each age should be similar to about five times the number of participants in the current valuation.
- (2) The relative number of actual decrements and exposures illustrates the credibility of the underlying experience to the reader of the experience study report. For example, the age 20-24 row in the example chart indicates that there was only one withdrawal for those ages over the five-year experience period. This would not be sufficient experience to make significant changes to this assumption.
- (3) The “crude rates” in the example chart are simply the ratio of the actual number of withdrawals to the exposure. By viewing the crude rates, the present rates, and the proposed new rates, the reader can gain an insight into the actuary’s smoothing techniques and into the judgments that were made.
- (4) The presentation allows verification that the “expected” figures in the experience study are derived from the assumption rates being used in the valuation.
- (5) It is easy to see if the proposed new rates match the final assumptions, and the assumptions used in the valuation reports.

At the next experience study, we strongly recommend that the retained actuary provide documentation on the actual decrements and exposures, similar to the example above, for all demographic assumptions reviewed. We recognize that the number of exposures may be small for this particular plan, but it is important for the retained actuary and the reader of the report to understand the relative credibility of data underlying the proposed assumptions.

Observations on Assumptions

Given the limited amount of historical data included in the experience study report, it is difficult to comment on the methods used to set the current demographic assumptions for the Plan. Overall, it

appears that the current demographic assumptions are reasonable. Below, we offer general observations and considerations for the retained actuary based on our experiences with similar plans.

Retirement – The rates at which participants are assumed to retire are based solely on the participant’s age. Since the plan allows participants to retire with 30 years of service (with no age requirement) and with 85 points (age plus service equals at least 85), it is likely that rates of retirement have some correlation to a participant’s service. At the next experience study, we recommend that the retained actuary review the impact of service on a participant’s chance of retiring or, at a minimum, consider increasing a participant’s rate of retirement in their first year of retirement eligibility.

Turnover – The rates at which participants are assumed to withdraw (or turnover) are based solely on the participant’s age. It is our experience that rates of withdrawal are much more correlated to a participant’s years of service than their age. At the next experience study, we recommend that the retained actuary review the impact of service on a participant’s chance of terminating prior to retirement eligibility.

Healthy Annuitant Mortality – The most important demographic assumption is mortality because this assumption is a predictor of how long pension payments will be made. The current assumption for healthy annuitant mortality is based on the RP-2000 mortality tables, with “collar adjustments” separately applied to the hourly and salaried participants, and with mortality improvements projected indefinitely into the future (or “fully generational”). This is an established mortality assumption and is appropriate for this purpose.

Disability Incidence and Mortality – Very little retirement plan experience generally exists in order to set a reasonable assumption based on actual retirement plan experience. The current assumptions for disability incidence and mortality seem reasonable. We recommend that the retained actuary track the actual experience for these assumptions and consider updating, as necessary.

Use of Blended Rates – The withdrawal and retirement rates in the experience study were developed on a gender distinct basis and then blended (we assumed the blending was based on the percentage of the covered employees that are male and female, although this is not disclosed in the report). When the population of a plan is not primarily one gender (90% or more) we would recommend that gender distinct assumptions be used for any demographic assumptions where there is a distinct difference based on gender (this is standard industry practice). The retained actuary takes gender distinct rates and blends them together for the proposed rates of withdrawal and retirement. The retained actuary does use gender distinct assumptions for rates of disability and mortality (no analysis was performed on these assumptions, but reasonable published tables are being used). We would recommend that gender distinct rates be used for withdrawal and retirement when gender distinct patterns are apparent.

Economic Assumptions

General

These assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of investment return and assumed rates of future salary increase. All economic assumptions are built upon an underlying inflation assumption.

Inflation

Inflation refers to mean price inflation as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It primarily impacts investment return and salary increases.

The current explicit inflation assumption is 3.50%. We consider this assumption to be within the reasonable range. Most economists forecast inflation rates lower than the current 3.50% assumption, but these forecasts are often for shorter periods than are necessary in preparing an actuarial valuation.

Investment Return Assumption

The investment return assumption is one of the principal assumptions in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date, in order to determine the liabilities of the retirement plan. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. The current assumption assumes inflation of 3.50% per annum plus an annual real rate of return of 3.75%, net of investment fees paid from the trust.

We believe an appropriate approach to reviewing an investment return assumption is to determine the median expected portfolio return given the retirement plan's target allocation and a given set of capital market assumptions. Per the Statement of Investment Objectives and Policy for the Plan, dated January 24, 2012, the Plan's current target asset allocation is:

Asset Class	Target
Large Cap Domestic Equity	15.0%
Mid Cap Domestic Equity	12.5%
Small Cap Domestic Equity	10.0%
International Equity	12.5%
Core Fixed Income	35.0%
High Yield Fixed Income	5.0%
Real Estate	5.0%
Master Limited Partnerships	5.0%
Total	100.0%

Because GRS is a benefits consulting firm and does not develop or maintain our own capital market assumptions, we reviewed assumptions developed and published by the following investment consulting firms:

- JP Morgan
- NEPC
- PCA
- Mercer
- RV Kuhns
- Towers Watson
- SunGuard

These investment consulting firms periodically issue reports that describe their capital market assumptions, that is, their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate

forward looking adjustments to better reflect near-term expectations. The estimates for core investments (i.e. fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds.

Given the Plan's current target asset allocation and the investment firms' capital market assumptions, the development of the average nominal return, net of investment fees paid from the trust, is provided in the following table:

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)-(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Estimated Investment Fees Paid from the Trust	Expected Nominal Return Net of Expenses (6)-(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	6.00%	2.50%	3.50%	3.50%	7.00%	0.10%	6.90%
2	6.88%	3.00%	3.88%	3.50%	7.38%	0.10%	7.28%
3	7.63%	3.26%	4.37%	3.50%	7.87%	0.10%	7.77%
4	7.00%	2.50%	4.50%	3.50%	8.00%	0.10%	7.90%
5	7.06%	2.40%	4.66%	3.50%	8.16%	0.10%	8.06%
6	7.33%	2.50%	4.83%	3.50%	8.33%	0.10%	8.23%
7	7.50%	2.50%	5.00%	3.50%	8.50%	0.10%	8.40%
Average	7.06%	2.67%	4.39%	3.50%	7.89%	0.10%	7.79%

We determined for each firm the expected nominal return rate based on the Plan's target allocation, and then subtracted that firm's expected inflation to arrive at their expected real return in column (4). Then we added back the Plan's current 3.50% inflation assumption and subtracted an estimated 0.10% for investment fees paid from the trust to get a net nominal return. As the table shows, the resulting average one-year return of the seven firms is 7.79%, which is greater than the current assumption of 7.25%. When we adjust for differences in inflation assumptions and for the investment fees paid from the trust, only one of the seven firms has an expected nominal return below the current 7.25%.

In addition to examining the expected one-year return, it is important to review anticipated volatility of the investment portfolio and understand the range of long-term net return that could be expected to be produced by the investment portfolio. Therefore, the following table provides the 25th, 50th, and 75th percentiles of the 20-year geometric average of the expected nominal return, net of investment fees paid from the trust, as well as the probability of exceeding the current 7.25% assumption.

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding
	25th	50th	75th	7.25%*
(1)	(2)	(3)	(4)	(5)
1	4.83%	6.38%	7.95%	35.4%
2	5.06%	6.70%	8.36%	41.1%
3	5.09%	6.99%	8.92%	46.3%
4	5.73%	7.34%	8.98%	51.5%
5	6.28%	7.65%	9.04%	57.9%
6	5.92%	7.61%	9.33%	55.7%
7	6.27%	7.86%	9.47%	60.2%
Average	5.60%	7.22%	8.86%	49.7%

* The Plan's current return assumption

As the analysis shows, there is a 50% likelihood that the 20-year average net nominal return will be between 5.60% and 8.86%. This is the best-estimate range under ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, as it currently exists. Further, the average results of all seven firms indicates there is approximately a 50% chance that the current target asset allocation will produce an average return that exceeds 7.25% over the next 20 years.

As a point of reference, the 2012 National Conference on Public Employee Retirement Systems (NCPERS) Fund Membership Study surveyed 147 state and local government pension funds. The average investment return assumption for responding funds was 7.7 percent.

We believe that the current investment return assumption is reasonable. We would recommend that the retained actuary present justification of this investment return assumption as part of their next experience study.

Expense Assumptions

As previously noted, the investment return assumption is net of expected investment fees paid from the trust. The other primary expenses that must be considered in an actuarial valuation are the administrative expenses.

The actuarial valuation currently has an explicit assumption of \$750,000 per year for administrative expenses. These assumed expenses are included with the normal cost in the calculation of the contribution for the year.

Based on the levels of administrative expenses noted in the recent valuation reports, this is a reasonable assumption and procedure for accounting for the administrative expenses.

Earnings Progression

In general, assumed rates of pay increase are often constructed as the total of three main components:

- Price inflation – currently 3.50%
- Economic Productivity Increases – base pay increases above price inflation. The assumption is not separately identified.
- Merit, Promotion, and Longevity – This portion of the salary increase assumption reflects components such as promotional increases as well as step increases for longevity. This portion of the assumption is not related to inflation. The current assumptions vary this component based on age.

In the context of a typical employer pay scale, pay levels are set for various employment grades. In general, this pay scale is adjusted as follows:

- The inflation assumption reflects overall inflation of the entire pay scale, and
- The Merit, Promotion, and Longevity increase assumption reflects movement of participants through the pay scale.

Based on the building block approach outlined above, the earnings progression assumption is based on the sum of the expected pay increases related to inflation plus a component for merit, promotion and longevity.

The analysis in the experience study did not use this approach, but instead analyzed the total earnings progression. We have concerns about this type of analysis. The actual inflation over the study period was about 2.6% per year. This means the experience for employees receiving only inflationary increases would have averaged 2.6% per year earnings growth. However, if that experience is going to be used to set future rates of earnings growth then these employees should be expected to continue to receive inflationary increases which are assumed to be 3.50% per year.

The current assumption for the Plan projects the pay for participants over age 58 at a rate below that of the assumed rate of inflation (3.00% to 3.20% earnings progression versus 3.50% inflation). This would imply that participants over the age of 58 are assumed to have pay decreases every year, after adjusting for inflation. At the next experience study, we would recommend that the retained actuary study the rates of earnings progression using a building block approach and also consider limiting the earnings progression assumption such that it does not project pay at a rate less than the assumed rate of inflation.

Additionally, it is our experience that rates of earnings progression are much more correlated to a participant's years of service than their age. At the next experience study, we recommend that the retained actuary review the impact of service on a participant's earnings progression.

Summary

In summary, the set of actuarial assumptions and methods, taken in combination, are within the range of reasonableness. Most importantly, we recommend that the retained actuary provide more detail regarding the approaches considered and justification for the assumptions proposed in the next experience study.

Additionally, we have the following recommendations regarding the actuarial assumptions:

- (1) At the next experience study, we recommend that the retained actuary review the impact of service on a participant's chance of leaving active service (i.e., withdrawal and retirement). The Plan provides certain retirement benefits based entirely on the service of the participant which could have an impact on the rate at which participants leave active service.
- (2) At the next experience study, we recommend that the retained actuary study the earnings progression assumption to review: (i) the impact of service on a participant's earnings progression, and (ii) the use of a building block approach for determining the rates of earnings progression.
- (3) At the next experience study, we recommend that the retained actuary consider sex distinct rates of withdrawal and retirement.

SECTION IV

ACTUARIAL METHODS AND FUNDING POLICY

ACTUARIAL METHODS AND FUNDING POLICY

Actuarial Cost Methods

General

The ultimate cost of the Plan is equal to the benefits paid plus the expenses related to operating the Plan. This cost is funded through contributions to the Plan plus the investment return on accumulated contributions which are not immediately needed to pay benefits or expenses. The level and timing of the contributions needed to fund the ultimate cost are determined by the actuarial assumptions, plan provisions, participant characteristics, investment experience, and the actuarial cost method.

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (TPV) between future normal costs and actuarial accrued liability. The retained actuary uses the entry age actuarial cost method, characterized by:

- (1) Normal Cost – the level percent of payroll contribution, paid from each participant’s date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant’s projected benefits from retirement to death.
- (2) Actuarial Accrued Liability – the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The entry age actuarial cost method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers. The Public Fund Survey published in 2011, sponsored by the National Association of State Retirement Administrators and the National Council on Teacher Retirement surveyed 126, mostly statewide, retirement systems. Over 75% of the plans reported using the entry age actuarial cost method. Therefore, the retained actuary’s stated methods for allocating the liabilities of the Plan are certainly in line with national trends.

Observations

In order to determine the normal cost as a level percentage of pay, the valuation must determine the Present Value of Future Salaries (PVFS) over which the Plan participants will accrue benefits. The calculation of PVFS should be determined in the same manner as the TPV. Specifically, the calculation of the PVFS should incorporate the same interest discount, decrement timing, and projected pay.

For the August 1, 2011 actuarial valuation, the TPV was developed assuming that participants left active service (retirement, disability, withdrawal or death) in the middle of the year. The PVFS was developed with three procedures that were inconsistent with those used to develop the TPV:

- The projected salary should incorporate the probability that the participant will decrement in the middle of the year and will not receive a full-year of projected salary;

- The calculation of PVFS should incorporate an additional one-half year interest discount to be consistent with the middle of year decrement timing; and
- The projected pay used to calculate PVFS is less than the pay used to calculate the projected benefits in the determination of TPV (by one-half year of assumed earnings progression).

This difference in timing and projected pay results in a disconnect between the TPV and PVFS that overstates the PVFS and understates the normal cost as a percentage of pay that is needed to fund the benefits promised by the Plan. The following table illustrates the differences in the two methods based on a selected test case reviewed during the actuarial audit:

Age	Probability of Surviving to Future Age	Probability of Decrementing at Future Age	Current Method			Most Appropriate Method		
			Projected Salary	Interest Discount	Present Value*	Projected Salary	Interest Discount	Present Value**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
49	100.00000%	3.13077%	50,297	1.00000	50,297	51,304	0.96561	48,764
50	96.86923%	3.58511%	52,320	0.93240	47,256	53,304	0.90033	45,628
51	93.28412%	3.53622%	54,303	0.86937	44,039	55,330	0.83947	42,507
52	89.74790%	3.49378%	56,366	0.81060	41,006	57,432	0.78273	39,560
53	86.25412%	3.45102%	58,508	0.75581	38,142	59,586	0.72981	36,758
54	82.80310%	3.41801%	60,670	0.70471	35,402	61,760	0.68048	34,081
55	79.38509%	2.62304%	62,851	0.65708	32,785	63,952	0.63448	31,679
56	76.76205%	2.69574%	65,053	0.61266	30,594	66,190	0.59159	29,530
57	74.06631%	2.78731%	67,334	0.57124	28,489	68,507	0.55160	27,462
58	71.27900%	2.90887%	69,694	0.53263	26,460	70,800	0.51431	25,425
59	68.37013%	2.97707%	71,915	0.49662	24,418	73,066	0.47954	23,434
60	65.39306%	2.99886%	74,216	0.46305	22,473	75,330	0.44713	21,521
61	62.39420%	1.76999%	76,457	0.43175	20,597	77,589	0.41690	19,896
62	60.62421%	13.58538%	78,738	0.40256	19,216	79,917	0.38872	16,723
63	47.03883%	12.87872%	81,098	0.37535	14,319	82,315	0.36244	12,113
64	34.16011%	11.04032%	83,537	0.34998	9,987	84,784	0.33794	8,206
65	23.11979%	8.60251%	86,036	0.32632	6,491	87,328	0.31510	5,178
66	14.51728%	6.11134%	88,634	0.30426	3,915	89,947	0.29380	3,029
67	8.40594%	4.35398%	91,292	0.28369	2,177	92,646	0.27394	1,581
68	4.05196%	2.10085%	94,029	0.26452	1,008	95,425	0.25542	732
69	1.95111%	1.95111%	96,845	0.24663	466	98,288	0.23815	457
Total Present Value of Future Salaries					499,537	474,264		

* (6) = (2) multiplied by (4) multiplied by (5)

** (9) = [(2) minus ½ of (3)] multiplied by (7) multiplied by (8)

It should be noted that the TPV remains unchanged. However, we feel that this method of determining PVFS is the most appropriate application of the Entry Age Normal cost method. The proposed enhancement to the Entry Age Normal cost method will only impact the allocation of the TPV between future normal costs and actuarial accrued liability. The implementation of this method for PHA should

not have a material impact on the overall valuation results, but this method should provide a more accurate representation of the normal cost as a percentage of pay (which portrays the relative cost of the Plan). Specifically, the normal cost as a percentage of pay should increase, but there should not be a material impact on the valuation results.

Asset Valuation Method

Market value is a clearly realistic current measure of the fund. Furthermore, using market value in the annual valuation has the advantage of using a value that is the same as the value shown in financial reports. It eliminates the need to explain the use of an asset value other than market value for making decisions regarding contributions and benefit enhancements.

However, sharp short-term swings in market value can result in large fluctuations in the contributions required to fund the Plan. Thus, many actuaries use an asset valuation method which smoothes out these fluctuations in support of achieving level contributions. A good asset valuation method places values on a retirement plan's assets which are related to current market value but which will also produce a smoother pattern of costs.

ASOP No. 44, Selection and Use of Asset Valuation Methods for Pension Valuations, provides a framework for the determination of actuarial value of assets (AVA) emphasizing that the method should bear a reasonable relationship to the market value of assets (MVA), recognize investment gains and losses over an appropriate time period, and avoid systematic bias that would overstate or understate the AVA in comparison to MVA.

The Plan currently uses MVA as the AVA in the annual valuation. We feel that this method is reasonable and is appropriately applied for the valuation.

Funding Policy

The amount of the actuarial accrued liability in excess of the AVA is defined to be the unfunded actuarial accrued liability (UAAL). The total contribution produced by an actuarial cost method is the total of the normal cost and an amount to amortize any UAAL.

PHA's current funding policy for the Plan is based on a slightly modified version of the Internal Revenue Code (IRC) and Employee Retirement Income Security Act of 1974 (ERISA) as it existed in 2007, prior to the enactment of the Pension Protection Act of 2006, as outlined in Richard White's letter dated June 18, 1997. A schedule is established for all changes in the UAAL such that the changes will be reflected in the funding policy contribution over a fixed period of 5 to 30 years, depending on the cause of the change (e.g., assumption change, plan modification, etc). This funding policy contribution is also reported as the Plan's Annual Required Contribution (ARC) for the pension disclosures required by the Governmental Accounting Standards Board (GASB).

This is a reasonable funding policy as it sets a schedule to fully fund the UAAL. This method also complies with the current GASB requirements since the ARC will amortize the UAAL over a period less than 30 years.

As a result of the investment market volatility since 2008, significant five-year amortization schedules were established for the Plan over the past few years (most notably the 2008 experience loss, the 2009

experience loss, and the 2011 experience gain). As each of these amortization schedules reach the end of their five-year period, PHA will notice volatility in the funding policy contribution produced by the current funding policy.

If all actuarial assumptions are met and no changes are made to the assumptions, methods, or plan provisions, the projected funding policy contributions toward the UAAL will be as follows:

	Projected UAAL Contribution (as of August 1, XXXX)					
	2011	2012	2013	2014	2015	2016
2008 Experience Loss	2,884,718	2,884,718	0	0	0	0
2009 Experience Loss	2,382,244	2,382,244	2,382,244	0	0	0
2011 Experience Gain	(1,994,329)	(1,994,329)	(1,994,329)	(1,994,329)	(1,994,329)	0
Remaining Bases	465,320	1,145,808	1,145,808	1,145,808	1,117,228	(17,399)
Total UAAL Contribution	3,737,953	4,418,441	1,533,723	(848,521)	(877,101)	(17,399)
Change	N/A	680,488	(2,884,718)	(2,382,244)	(28,580)	859,702

In addition to the projected contributions toward the UAAL noted above, the final funding policy contribution in each year will also include the normal cost and the amortization of any unexpected changes in the UAAL.

PHA could consider many different funding policy options to avoid this projected contribution volatility. One option consistent with ERISA would be to “combine and offset” some, or all, of the outstanding UAAL amortization bases. “Combining and offsetting” was a method allowed under ERISA through 2007 where amortization bases are combined and the net outstanding balance is amortized over a common period. Under this option, the short-term volatility in the projected UAAL contributions could be smoothed out. PHA could also wipe out all existing amortization bases and establish one single amortization schedule, equal to the UAAL, which will be paid down over a single period (e.g., 10 years).

Ultimately, PHA is not required to adhere strictly to the funding requirements of ERISA, so there are many different methods of mitigating this contribution volatility that PHA could consider in consultation with their retained actuary.

As we stated earlier, the current funding policy is reasonable. This additional discussion was only an observation based on the potential contribution volatility in the near future.

Summary

In summary, we have the following recommendations regarding the application of the actuarial methods and funding policy:

- (1) We recommend an adjustment to the application of the actuarial cost method to eliminate the disconnect between the calculation of TPV and PVFS. We feel that our proposed method of determining PVFS is the most appropriate application of the Entry Age Normal cost method. The implementation of this method for PHA should not have a significant impact on the valuation results, but would provide a more accurate representation of the normal cost as a percentage of pay which portrays the relative cost of the Plan.

- (2) As a result of the investment market volatility since 2008, PHA will notice volatility in the funding policy contribution produced by the current funding policy. The detailed description above outlines the source of the volatility and provides our observations.

SECTION V

ACTUARIAL VALUATION RESULTS

ACTUARIAL VALUATION RESULTS

Data

We received copies of the raw data files provided by PHA to the retained actuary containing data on each participant and benefit recipient covered under the Plan. We also received copies of the final data files used by the retained actuary to prepare the actuarial valuation.

We found the data used by the retained actuary to produce the 2011 actuarial valuation to be a reasonable representation of the raw data originally provided by PHA.

Benefits

Every employer is different and every employer's retirement plan is different. Each employer has a set of business needs that dictate the type of retirement benefit that is most appropriate for their employees. Additionally, the amount of resources available to allocate to the retirement plan will dictate the level of benefits provided by the retirement plan. Regardless of the reasons for the benefit design, the employer must understand the liability and contribution requirements associated with the benefits promised. As a result, the actuarial valuation and the resulting funding policy contribution must properly reflect the benefit structure of the retirement plan.

In general, the benefits promised by the Plan were reasonably incorporated in the actuarial valuation of the Plan, except as noted below.

We noted that the plan provides a very valuable benefit to participants that work past their Normal Retirement Date (NRD). Specifically, participants that work beyond their NRD receive a monthly pension benefit equal to the greater of (1) or (2) below:

- (1) Normal Retirement Benefit formula using Years of Benefit Service and Compensation through their Late Retirement Date; or
- (2) A benefit equal to the sum of (a) and (b) below:
 - (a) Actuarial Equivalent of the Accrued Benefit calculated as if the participant retired on their NRD increased at the Applicable Interest Rate from their NRD to their Late Retirement Date, and
 - (b) 2.3% of the participant's Average Monthly Compensation multiplied by the difference between Years of Benefit Service determined at their Late Retirement Date and Years of Benefit Service determined at their NRD.

Currently, the actuarial valuation only incorporates the benefits provided by Part 1 of this formula. However, Part 2 of the formula provides an extremely valuable benefit to participants that work past their NRD. Specifically, Part 2(a) provides actuarial increases beyond NRD and Part (b) provides further accruals for each year worked beyond NRD. In most cases, Part 2 should provide a more valuable benefit to the participant and, in some cases, a significantly more valuable benefit. As a result of Part 2 not being incorporated into the valuation of active employees, the value of Part 2 of the benefit formula is not included in the development of the normal cost nor the accrued liability of active

employees, and is only incorporated into the actuarial valuation once the participant retires and the final benefit is calculated.

The following example illustrates the accrual of benefits for each part of the benefit formula for a sample participant:

Age	Pay for Prior Year	Years of Service	Average Compensation	Benefit Formula			Total Part 2
				Part 1	Part 2(a)	Part 2(b)	
61	75,330	10.5					
62	77,589	11.5					
63	79,917	12.5					
64	82,315	13.5					
65	84,784	14.5	79,987	26,676	26,676	0	26,676
66	87,328	15.5	82,387	29,371	28,959	1,895	30,854
67	89,947	16.5	84,858	32,204	31,466	3,903	35,369
68	92,646	17.5	87,404	35,180	34,231	6,031	40,262
69	95,425	18.5	90,026	38,306	37,291	8,282	45,573
70	98,288	19.5	92,727	41,588	40,682	10,664	51,346

Part 1 = 2.3% of Average Compensation multiplied by Service

Part 2(a) = Actuarially increased Age 65 accrued benefit

Part 2(b) = 2.3% of Average Compensation multiplied by Service after Age 65

We recommend that the retained actuary incorporate the value of Part 2 of the benefit formula into the actuarial valuation. The impact of this benefit on the valuation results should not be material, but we believe that the value of the benefit should be incorporated into the actuarial valuation so that the value of the benefit is funded over the course of a participant's career. Otherwise, the value of the benefit will emerge as an actuarial loss following the participant's retirement which will then have to be funded over the subsequent five-year period (consistent with the current funding policy).

Actuarial Valuation Results

As part of our review, GRS requested sample participant calculations from the retained actuary to ensure that the retained actuary valued the correct benefit levels, used the correct assumptions, and calculated the liabilities correctly on an individual basis.

Generally accepted actuarial standards and practices provide actuaries with the basic mathematics and framework for calculating the actuarial results. When it comes to applying those actuarial standards to complex calculations, differences may exist due to individual opinion on the best way to make those complex calculations. This may lead to differences in the calculated results, but these differences should not be material.

Active Participants. At the onset of the review, we requested that the retained actuary provide sample liability calculations that show probabilities of decrement by age, estimated pay and benefits by age, and values of benefits or pay by age for each decrement in sufficient detail to verify the calculation of

the present value of benefits, present value of pay, accrued liability and normal cost for 10 active participants. The retained actuary provided all of the information we requested regarding the active participants.

We have previously noted our opinion on the application of the method used and the assumptions. Based on our review of the other aspects of the actuarial valuation, the liability determination of active participants was reasonable and appropriately determined.

Deferred Vested Participants. At the onset of the review, we requested that the retained actuary provide the liability amount, benefit amount, form of benefit, age of participant, and age of beneficiary (where applicable) for 10 deferred vested participants. The retained actuary provided all of the information we requested regarding the deferred vested participants.

Based on our review, the liability determination of deferred vested participants was reasonable and consistent with the stated assumptions and methods.

Annuitants. At the onset of the review, we requested that the retained actuary provide liability amount, benefit amount, form of benefit, age of participant, and age of beneficiary (where applicable) for 10 annuitants. The retained actuary provided all of the information we requested regarding the annuitants.

Based on our review, the liability determination of annuitants was reasonable and consistent with the stated assumptions and methods.

Summary

Besides the comments in Sections III and IV regarding the assumptions and methods, the valuation results are developed in a reasonable manner. We recommend that the value of the Late Retirement Benefit be included in the actuarial valuation so that the value of the Late Retirement Benefit is funded over the course of the participant's career.

SECTION VI

CONTENT OF THE VALUATION REPORT

CONTENT OF THE VALUATION REPORT

ASOP No. 4, Measuring Pension Obligations and Determining Pension Plan Costs, provides guidance for measuring pension obligations and communicating the results. The Standard lists specific elements to be included, either directly or by references to prior communication, in pension actuarial communications. The pertinent items that should be included in actuarial valuation report on a pension plan should include:

- The name of the person or firm retaining the actuary and the purposes that the communication is intended to serve.
- A statement as to the effective date of the calculations, the date as of which the participant and financial information were compiled, and the sources and adequacy of such information.
- An outline of the benefits being discussed or valued and of any significant benefits not included in the actuarial determinations.
- A summary of the participant information, separated into significant categories such as active, retired, and terminated with future benefits payable. Actuaries are encouraged to include a detailed display of the characteristics of each category and reconciliation with prior reported data.
- A description of the actuarial assumptions, cost method and the asset valuation method used. Changes in assumptions and methods from those used in previous communications should be stated and their effects noted. If the actuary expects that the long-term trend of costs resulting from the continued use of present assumptions and methods would result in a significantly increased or decreased cost basis, this should also be communicated.
- A summary of asset information and derivation of the actuarial value of assets. Actuaries are encouraged to include an asset summary by category of investment and reconciliation with prior reported assets showing total contributions, benefits, investment return, and any other reconciliation items.
- A statement of the findings, conclusions, or recommendations necessary to satisfy the purpose of the communication and a summary of the actuarial determinations upon which these are based. The communication should include applicable actuarial information regarding financial reporting. Actuaries are encouraged to include derivation of the items underlying these actuarial determinations.
- A disclosure of any facts which, if not disclosed, might reasonably be expected to lead to an incomplete understanding of the communication.

We have reviewed the actuarial valuation report prepared by the retained actuary and there are a few modifications to the report that would allow it to adhere more closely with ASOP No. 4.

For purposes of this actuarial audit, we received a copy of the Port of Houston Authority Restated Retirement Plan August 1, 2011 Actuarial Valuation Report, dated November 29, 2011 (hereafter, referred to as “the report”). This valuation report outlines how the Plan complies with the requirements of ERISA in effect in 2007. Additionally, we received a copy of a separate cover letter to the valuation report, dated November 29, 2011 (hereafter, referred to as “the cover letter”).

General Comment

As stated by the retained actuary in the cover letter, the Plan is not subject to the contribution requirements of ERISA, nor the contribution limitations of the IRC, since PHA is considered a governmental entity. As a result, PHA has the ability to set its own funding policy. Accordingly, PHA adopted a slightly modified version of the minimum funding requirements of ERISA for their funding policy. However, a significant portion of the report is dedicated to: (i) developing a minimum funding requirement that differs from the funding policy contribution, and (ii) calculating a maximum tax deductible contribution which is not applicable to PHA.

We have a number of recommendations to improve the communication of the valuation report that will make the report more appropriate for the intended purpose of communicating the funding policy contribution, the funded status of the plan, and required GASB disclosures.

- (1) Currently, the cover letter includes a clear statement that the contribution requirements of IRC and ERISA have no application to PHA and the Plan. However, this statement never appears in the actual report. At a minimum, we strongly recommend that a similar statement be included in the valuation report in addition to the cover letter.
- (2) The retained actuary keeps track of one set of amortization bases which are used to calculate the funding policy contribution and a second set of very similar amortization bases, developed in accordance with ERISA, that are used solely to maintain the hypothetical Funding Standard Account. We recommend that the retained actuary only maintain one set of amortization bases that are consistent with the funding policy adopted by PHA. When this change is implemented, contribution calculations in Exhibits 12 and 14 will more closely correspond with the funding policy contributions and a separate cover letter will not be necessary to develop the funding policy contribution. Currently, the contribution calculations in Exhibits 12 and 14 are not based on the funding policy, so the resulting amounts in these Exhibits can be misleading and confusing.
- (3) All references to Maximum Deductible Contributions and IRC Section 404 should be removed from the report. Tax deductibility is not applicable to PHA and the inclusion of this information could be very misleading to the reader of the valuation report. Specifically, we believe the following portions of the report should be removed entirely: *Exhibit 13 – Charges and Credits for Maximum Deductible Contribution*, *Exhibit 15 – Maximum Deductible Contribution under IRC Section 404*, and *Appendix D – Description of the Maximum Deductible Contribution Limit*.
- (4) *Appendix C – General Rules* outlines additional requirements of ERISA that are not applicable to PHA. We recommend modifying this Appendix to outline the funding policy for the Plan so that the funding policy is documented within the valuation report.

As we stated previously, the funding policy is reasonable. These recommended modifications will allow the retained actuary to directly communicate the funding policy contribution, the funded status of the plan, and required GASB disclosures within the valuation report.

Participant Data

Page ES-2 of the report provides a summary of the active and inactive participants included in the current valuation and the prior valuation. Additionally, Exhibit 1 and Exhibit 2 provide further detail

on these active and inactive participants. In general, these summaries give a clear presentation of the composition of the Plan participants.

PHA provides the retained actuary with a compensation field for each participant, titled “Comp1”, on the data file used to prepare the actuarial valuation. Based on discussions with PHA, this amount is the rate of pay for the participant as of the valuation date. The retained actuary projects “Comp1” to develop the “total annual compensation” which is the expected payroll for the upcoming year. “Total annual compensation” is the basis of the active compensation stated on page ES-2, the divisor in each of the percentages in the “Costs and Contributions” section on page ES-3, and the covered payroll stated in Appendix F-1. However, “Comp1” is used in the development of Exhibit 1 and not referenced anywhere else in the valuation report. The result is different average compensation amounts reported on page ES-2 and Exhibit 1. We recommend that “total annual compensation” also be used in the development of Exhibit 1 so that the compensation amounts utilized throughout the report are consistent or a footnote be added on Exhibit 1 to describe the differences.

Exhibit 5: Estimated Investment Return on Market Value of Assets

Exhibit 5 estimates the return on the market value of assets during the prior year using a very common approach that assumes all cash flows occur in the middle of the fiscal year. The estimated returns on plan assets can be used for many purposes by the plan sponsor (e.g., evaluation of investment advisors, comparison to benchmarks, etc). In the context of the actuarial valuation report, this estimate of the return is generally used as a comparison to the valuation assumption for investment returns.

Currently, the estimated investment return in Exhibit 5 is not determined in a consistent manner with the investment return assumption for the valuation. According to the retained actuary, the investment return assumption is 7.25% net of investment expenses. As a result, the investment expenses (provided on line 3.b. of Exhibit 4) should be included as an offset to the investment income (line 4 in Exhibit 5) used to estimate the investment return. If the estimated investment return was calculated in a manner consistent with the stated valuation assumption for investment returns, the result would be 13.50%.

We recommend modifying the calculation of the estimated investment return to be more consistent with the valuation assumption for investment returns. If this recommendation is adopted, the description of the calculation provided at the top of Exhibit 5 should be updated to describe the method used (i.e., remove “administrative expenses” from the description). However, if this recommendation is not adopted, the description at the top of Exhibit 6 should be reviewed to make sure that it is consistent with the calculations outlined in Exhibit 5 (e.g., this description does not mention administrative expenses).

Appendix A: Summary of Actuarial Assumptions and Methods

The presentation is generally complete and understandable. The methods described in this section are reasonable and appropriate for public plans.

We do have a few suggestions to improve the overall communication of the valuation assumptions.

Earnings Progression (Page A-3) – In general, earnings progression (or salary scale) assumptions are comprised of three main sources of increase: (i) price inflation, (ii) economic productivity increases, and (iii) the merit, promotion and longevity increases for the individual worker. The statement of the

assumption in the valuation report only shows the aggregate rates and provides no further description about the development of the assumption. We recommend that the retained actuary include a statement indicating that the stated rates include all sources of assumed earnings progression, including inflation.

Mortality Assumption for Healthy Lives (Page A-3) – Mortality assumptions, incorporating future expected mortality improvements, are fairly new for actuarial valuations of pension plans. As a result, the statement of these assumptions is still evolving. In order to be more clear about the mortality assumption for healthy lives, we recommend that the retained actuary state the base year for mortality improvements and the type of mortality projection. In this case, the base year for mortality improvements is the year 2000 and the mortality improvement is fully generational (i.e., assumed to improve every year in the future).

Mortality Assumption for Disabled Lives (Page A-3) – The “Pragmatic Disabled Lives Continuance Table” used for valuation purposes may be appropriate, based on experience, but the table is not an established and well documented table. Based on a comparison to established mortality tables, we determined that the valuation mortality table was a blend of the 1965 Railroad Retirement Board Disabled Annuitants Mortality Table and 1971 Group Annuity Mortality Table. The retained actuary subsequently confirmed this determination.

We recommend that the retained actuary improve the description of this assumption so that the reader of the valuation report can better understand the assumption. This improved disclosure could be accomplished by summarizing sample values from the stated table, providing a reference to the study that developed the table, or providing detail regarding the basis for the table.

Appendix F: GASB 25/27 Documentation

GASB 25 Schedule of Amortization Bases (Page F-1) – GASB Statement Number 25 (GASB 25) does not prescribe a Schedule of Amortization Bases. However, paragraph 40(a) of GASB 25 requires the disclosure of the amortization period and amortization method as part of the identification of actuarial methods and assumptions. We recommend that the retained actuary provide the description of amortization bases as a supplement to the statement of assumptions and methods for GASB 25 purposes and not identify the information as a specific GASB 25 schedule.

GASB 25 Schedule of Employer Contributions for the Plan Year Ended 7/31/12 (Page F-2) – The schedule on page F-2 of the valuation report does not contain the information required by GASB 25 for the Schedule of Employer Contributions. The Schedule of Employer Contributions provided in Appendix F-2 properly follows the requirements of GASB 25. We recommend that the retained actuary combine the information on page F-2 with the information in Appendix F-2 or remove the schedule from page F-2 altogether.

At the time the report is drafted, it is not possible to know the actual employer contribution for the subsequent fiscal year. As a result, one suggestion would be to combine the information in the following manner, if necessary, which complies with the format of the disclosures outlined in GASB 25.

Year Ended July 31	Annual Required Contribution	Percent Contributed
2006	5,813,248	100%
2007	6,509,928	100%
2008	3,929,348	100%
2009	7,357,368	100%
2010	9,857,308	100%
2011	10,808,796	100%
2012	8,132,756	N/A

Summary

In general, the actuarial valuation report complied with the Actuarial Standards of Practice. We recommend the following changes that will improve the ability of the report to better communicate the intended results.

- (1) We recommend that the overall report be enhanced to eliminate the detail regarding the maximum deductible contribution and consolidate the two sets of amortization bases into a single set of bases that adhere to the current funding policy for the Plan.
- (2) We recommend that the compensation reported on page ES-2 and Exhibit 1 be consistent or include a footnote about the definition of pay used.
- (3) The estimated investment return in Exhibit 5 should be determined in a manner that is more consistent with the assumption for investment return.
- (4) The statement of assumptions in Appendix A for earnings progression and mortality should be expanded to better describe the assumptions utilized in the actuarial valuation.
- (5) The GASB documentation in Appendix F should be modified to comply with the information outlined in GASB Nos. 25 and 27.

SECTION VII

SUMMARY OF FINDINGS AND FINAL REMARKS

SUMMARY OF FINDINGS AND FINAL REMARKS

Summary of Findings

Based on our review, the actuarial valuation, studies, and reports of the Plan are reasonable, used reasonable assumptions, and complied with actuarial guidelines. We offer the following recommendations based on the valuation methods and assumptions used by the retained actuary in the August 1, 2011 actuarial valuation.

Actuarial Assumptions

- (1) We recommend that the retained actuary provide more detail regarding the approaches considered and justification for the assumptions proposed in order to comply with ASOP No. 41 in the next experience study.
- (2) At the next experience study, we recommend that the retained actuary review the impact of service on a participant's chance of leaving active service (i.e., withdrawal and retirement). The Plan provides certain retirement benefits based entirely on the service of the participant which could have an impact on the rate at which participants leave active service.
- (3) At the next experience study, we recommend that the retained actuary study the earnings progression assumption to review: (i) the impact of service on a participant's earnings progression, and (ii) the use of a building block approach for determining the rates of earnings progression.
- (4) At the next experience study, we recommend that the retained actuary consider sex distinct rates of withdrawal and retirement.

Actuarial Methods and Funding Policy

- (5) We recommend an adjustment to the application of the actuarial cost method to eliminate the disconnect between the calculation of TPV and PVFS. We feel that our proposed method of determining PVFS is the most appropriate application of the Entry Age Normal cost method. The implementation of this method for PHA should not have a material impact on the valuation results, but would provide a more accurate representation of the normal cost as a percentage of pay which portrays the relative cost of the Plan.
- (6) As a result of the investment market volatility since 2008, PHA will notice volatility in the funding policy contribution produced by the current funding policy. The detailed description provided in Section IV outlines the source of the volatility and provides our observations.

Actuarial Valuation Results

- (7) We recommend that the value of the Late Retirement Benefit be included in the actuarial valuation so that the value of the Late Retirement Benefit is funded over the course of the participant's career.

Content of Valuation Report

- (8) We recommend that the overall report be enhanced to eliminate the detail regarding the maximum deductible contribution and consolidate the two sets of amortization bases into a single set of bases that adhere to the current funding policy for the Plan.

- (9) We recommend that the compensation reported on page ES-2 and Exhibit 1 be consistent or include a footnote about the definition of pay used.
- (10) The estimated investment return in Exhibit 5 should be determined in a manner that is more consistent with the assumption for investment return.
- (11) The statement of assumptions in Appendix A for earnings progression and mortality should be expanded to better describe the assumptions utilized in the actuarial valuation.
- (12) The GASB documentation in Appendix F should be modified to comply with the information outlined in GASB Nos. 25 and 27.

Final Remarks

The auditing actuarial firm, Gabriel, Roeder, Smith & Company (GRS), is independent of the retained actuarial firm. The auditing actuaries are not aware of any conflict of interest that would impair the objectivity of this work.

We have presented many suggestions for areas where we believe the product can be improved. The retained actuary has access to information and a long history of experience with PHA. We understand that the retained actuary may agree with some of our recommendations, while rejecting others. We ask that the retained actuary and PHA consider our recommendations carefully. We hope that the retained actuary and PHA find these suggestions useful.



PORT OF HOUSTON AUTHORITY

August 15, 2012

Mr. R. Ryan Falls
Gabriel, Roeder, Smith & Company
5605 N. MacArthur Blvd., Suite 870
Irving, TX 75038-2631

Dear Ryan:

Thank you for your report dated July 13, 2012 (the "Report"), of an actuarial audit of the August 1, 2011 Actuarial Valuation of the Port of Houston Authority Restated Retirement Plan (the "Plan"). The Report constitutes the preliminary draft submitted to us for purposes of discussion and clarification in accordance with Section 802.1012(f) of the Texas Government Code.

In Section VII of the Report, you include a Summary of Findings and Final Remarks:

"Based on our review, the actuarial valuation, studies, and reports of the Plan are reasonable, used reasonable assumptions, and complied with actuarial guidelines. We offer the following recommendations based on the valuation methods and assumptions used by the retained actuary in the August 1, 2011 actuarial valuation."

The management of the Port of Houston Authority ("PHA") is appreciative of the efforts, insights and perspectives presented in the Report. The thoroughness, expediency of execution and professionalism exhibited by all parties participating in this review were exceptional. Attached is PHA's response to your individual findings. We are available for further discussion at your convenience.

Sincerely yours,

/s/ Thomas J. Heidt

Thomas J. Heidt
Vice President, Finance and Administration

Actuarial Assumptions

(1) **Finding:**

We recommend that the retained actuary provide more detail regarding the approaches considered and justification for the assumptions proposed in order to comply with ASOP No. 41 in the next experience study.

Management Response:

Although not detailed in the official experience study, many discussions and meetings, including review of detailed presentation materials, occurred prior to the release of the final reports. These details were reviewed by Plan management and Milliman, the retained actuary. Going forward, we will include more detail relating to approaches considered, as deemed appropriate, in the experience study report. We agree that communications are subject to ASOP 41.

(2) **Finding:**

At the next experience study, we recommend that the retained actuary review the impact of service on a participant's chance of leaving active service (i.e., withdrawal and retirement). The Plan provides certain retirement benefits based entirely on the service of the participant which could have an impact on the rate at which participants leave active service.

Management Response:

Currently, withdrawal and retirement assumptions are based on age. Additional consideration will be given to the impact of service based withdrawals in future experience studies and modifications will be made if determined appropriate by management and the retained actuary.

(3) **Finding:**

At the next experience study, we recommend that the retained actuary study the earnings progression assumption to review: (i) the impact of service on a participant's earnings progression, and (ii) the use of a building block approach for determining the rates of earnings progression.

Management Response:

Currently, the salary scale assumption is based on age. Additional consideration will be given to the impact of service-based earnings progression in future experience studies as the re-evaluation of all assumptions will be made to comply with recent regulatory changes.

(4) **Finding:**

At the next experience study, we recommend that the retained actuary consider sex distinct rates of withdrawal and retirement.

Management Response:

Currently, withdrawal and retirement assumptions are blended. Additional consideration will be given to sex distinct withdrawal tables in future studies.

Actuarial Methods and Funding Policy

(5) ***Finding:***

We recommend an adjustment to the application of the actuarial cost method to eliminate the disconnect between the calculation of TPV and PVFS. We feel that our proposed method of determining PVFS is the most appropriate application of the Entry Age Normal cost method. The implementation of this method for PHA should not have a material impact on the valuation results, but would provide a more accurate representation of the normal cost as a percentage of pay which portrays the relative cost of the Plan.

Management Response:

We acknowledge that there is technically a disconnection and agree that the impact is not material. We will continue to monitor this calculation and will consider appropriate modifications on a prospective basis as the re-evaluation of all assumptions will be made to comply with recent regulatory changes.

(6) ***Finding:***

As a result of the investment market volatility since 2008, PHA will notice volatility in the funding policy contribution produced by the current funding policy. The detailed description provided in Section IV outlines the source of the volatility and provides our observations.

Management Response:

The Plan's funding policy is periodically reviewed with the actuary and volatility reduction recommendations have been considered in the past. PHA management has determined that the five-year amortization period is acceptable, but will continue to monitor such volatility and will consider appropriate modifications in funding policy on a prospective basis.

Actuarial Valuation Results

(7) ***Finding:***

We recommend that the value of the Late Retirement Benefit be included in the actuarial valuation so that the value of the Late Retirement Benefit is funded over the course of the participant's career.

Management Response:

While exclusion of the potential full value of Late Retirement Benefits has not had a material impact on the valuation, PHA management accepts the recommendation and plans to include such potential full Late Retirement Benefits in the actuarial valuation calculation for future valuation reports.

Content of Valuation Report

(8) Finding:

We recommend that the overall report be enhanced to eliminate the detail regarding the maximum deductible contribution and consolidate the two sets of amortization bases into a single set of bases that adhere to the current funding policy for the Plan.

Management Response:

Much of the additional detail included in the valuation report is routinely used for discussion purposes when presenting the report to the Pension and Benefits Task Force. We will continue to evaluate the discretionary content of the valuation report and will consider appropriate modifications on a prospective basis.

(9) Finding:

We recommend that the compensation reported on page ES-2 and Exhibit 1 be consistent or include a footnote about the definition of pay used.

Management Response:

One of the compensation figures has a projected salary increase included. Footnote disclosures will be included in future reports as needed to provide appropriate clarification.

(10) Finding:

The estimated investment return in Exhibit 5 should be determined in a manner that is more consistent with the assumption for investment return.

Management Response:

We acknowledge this finding and will consider modifications to the estimated investment return calculations on a prospective basis. Investment return assumptions as well as the re-evaluation of all assumptions will be made to comply with recent regulatory changes.

(11) Finding:

The statement of assumptions in Appendix A for earnings progression and mortality should be expanded to better describe the assumptions utilized in the actuarial valuation.

Management Response:

Appropriate modifications to the statement of assumptions in Appendix A for earnings progression and mortality will be considered to better describe the assumptions utilized in the actuarial valuation in future reports.

(12) Finding:

The GASB documentation in Appendix F should be modified to comply with the information outlined in GASB Nos. 25 and 27.

Management Response:

Appropriate modifications to Appendix F, if necessary, will be made to ensure compliance with GASB Nos. 25 and 27, and other regulatory requirements.