APPENDIX D
USER SUPPLY FEES

In 1987 Black and Veatch conducted a study to develop relative benefit allocations and alternative water charge schedules for Commission sponsored reservoir projects. The water charge schedules would be designed to recover the non-federal costs of these projects which included the existing Blue Marsh and Beltzville water supply reservoirs and the modification of F.E. Walter and Prompton Reservoirs to hold water supply storage. The Commission also desired to determine the financial impact of charging ground water users and the amendment of Section 15.1(b) of the October, 1961 DRBC Compact that would allow charging pre-compact water users.

Black and Veatch sought to develop alternative water charge systems which could be used to recover the costs of the non-federal share of the reservoir projects. These alternative methods studies were based on relative benefits to the users and also on a cost causative methodology. The Commission's Water Project Financing and Water Charges Advisory Committee (Advisory Committee), which worked in tandem with the consultant as the report progressed, eventually recommended that a third charging system using a combination of both relative benefits and cost causative methods be applied.

The relative benefits allocation and water charge alternatives in the Black and Veatch Report were developed after an extensive review process led by the Advisory Committee, as well as DRBC representatives and staff and a final report was submitted April 1987.

The Commission is responsible for financing the nonfederal portion of projects costs, and because state funds were reportedly not available, it was proposed that revenue bonds be issued by DRBC to fund the two modification projects as well as the annual costs for the two existing reservoirs. The annual debt service on these bonds, as well as annual operation, maintenance and administrative expenses, would be recovered through water user charges. Currently, the Commission repays its nonfederal share of reservoir costs by repaying a loan from the federal government. The two project modifications were identified in DRBC's Level B study and in the Good Faith Agreement.

Benefits Allocation Methodology

Part One of the Black and Veatch Report presented the results of the development and implementation of the relative benefits allocation. Generally, the relative benefits allocation was made using a weighting system to assign relative importance units to predetermined benefit categories. These benefit weightings were then allocated across water user categories and to sub-basins. The general theory behind this method is that the total benefits received by each user or sub-basin were based on relative shares of depletive surface or groundwater use within the basin. The more water a user consumed, the greater the benefit that was derived from the reservoir projects. All depletive water use data used in this methodology was developed from DRBC's 1986 Water Use Inventory.

The first step in the benefits allocation methodology involved identifying nine water user groups from the 1986 DRBC water use inventory:

- Municipal
- Rural Domestic and Livestock

• Industrial Self Supplied
• Power Generators
• Golf Sources
• Agricultural Irrigation
• Institutional and Other
• Recreational Use
• Fisheries

In addition to water user groups, 12 designated sub-basins were identified, which were in turn, separated by state portion or area of interest into 21 sub-areas.

After identifying user groups and sub-basins, a weighting system was used to assign relative percent (%) units to each of nine benefit categories. The overall theory was that each benefit category is assumed to have some unknown quantity of basin wide benefits which is designated at 100 percent. Therefore, all of the benefits of each category over all 21 sub-areas are equal to 100 percent.

The weighting of each category was essentially a judgmental assignment of relative importance units based on information available at the time. Weighting was achieved through the development of 12 computer runs used to determine the amount of water supply needed to 1) compensate for current depletive use, 2) provide for new or future depletive use, 3) increase salinity standards at River Mile 98, 4) offset sea level rise through the year 2000. It was determined that a total of 485 cfs would be required to fulfill these goals. The four reservoir projects combined could provide 615 cfs. The additional storage, 130 cfs, would be available for future use.

Benefit categories were weighted according to how much flow would be required in proportion to the total available storage.

TABLE 45
FLOW AUGMENTATION ALLOCATION

	Depletive Use cfs	Salinity Control cfs	Total cfs	Percent %
Water to Compensate for Current Depletive use	135		135	22
Water to provide for Salinity Improvement	200		200	33
Water to Compensate for Future Depletive Use	130		130	21
Water to Fight Sea Level Rise		150	150	24
	465	150	615	100

cfs figures represent June-September drought condition flow requirements at Trenton.

In establishing importance weightings several underlying factors have been considered including:

- The judgmental nature of the weighting assignment.

- The need for flow augmentation and salinity protection relative to project storage capacity as determined from DRBC special flow and salinity computer model runs.

- The potential for realizing drought and salinity related benefits is quite substantial.

- One of the benefit categories (fisheries improvements) is judged to be not allocable with available information and has thus been Liven a weighting of zero.

- Since other plausible weightings can be formulated, sensitivity analysis was used to help judge the ultimate impact of alternative weightings on allocated relative benefits.

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Benefit categories were weighted as follows:

Benefits Category	***Weight %***
Compensate for Depletive use	43.00
Increased Supply for future Depletive use	20.00
Salinity Control-PRM Protection	19.49
Reduced Risk of Restriction on Essential Depletive use	10.00
Salinity Control-surface water users	4.51
Increased Reliability of Supply-surface water	2.00
Recreation-downstream	1.00
Increased Reliability of Supply-groundwater	0.00
Fisheries improvement and Protection	0.00

Note in the table above that the Downstream Recreation was assigned a weighting of one percent based on some downstream rafting on the Lehigh during low flow or drought conditions. The benefit to Increased Reliability of Supply-groundwater was also assumed to be insignificant and was given a weighting of zero percent. The benefit to Increased Reliability of Supply-surface water was assigned to be two percent.

The combined recreation and reliability benefit was assigned to be three percent. Therefore, 97 percent remained to be allocated to the remaining categories.

As it was assumed that benefits accrue to water users in proportion to their use, weighted benefit percentages were allocated across water user categories and sub-basins based on the proportion of depletive water use in each sub-basin and user category relative to basin-wide depletive use. An example of application of the relative benefit formula is given in *Volume 2, Appendix F* of the Report.

Based on the 1986 Water Use Inventory, the benefit allocation **by state** was determined to be as follows:

State	***% Allocation of Total Benefits from Reservoirs***
Pennsylvania	46.97
New Jersey	50.06
Delaware	2.22
New York	0.7511

The benefit allocation **by user category** was determined to be as follows:

User	***% Allocation of Total Benefits from Reservoirs***
Municipal	50.43
Industrial	19.37
Power	7.33
Golf	3.42

Summaries of the relative benefit allocations for the basin and each state is provided in *Tables 14-18* in the Appendix and on pages 41-45 of the Report.

The relative weightings were calculated using various assumptions. Please refer to *Procedures for Sub-Basin and User category Allocations of Relative Benefits*, pages 25-37 of the Report, for additional information on the basis of the allocations. *Appendix D* in *Volume 2* of the Report contains detailed sub-basin allocations based on the DRBC water use survey.

Alternative Water Charge Schedules

Part Two of the Report developed examples of alternative water charge schedules which could recover DRBC's costs to pay for the four DRBC reservoirs. The aim was to make the schedules as fair and equitable as practical.

Two basic alternative charging methods were developed. One method relies primarily on the allocated benefits as the basis of determining charges and the other method relies primarily on allocations based on cost causative factors. The Commissioners and the Advisory Committee selected the policy options to be considered in developing the charging schedules. A wide range of documents including those relating to the Commission's authority and studies made by the Commission staff were reviewed. These documents provided information concerning public opinion regarding the DRBC imposed water charges and on the basic legal framework that would ultimately control any water charge system adopted by the Commission.

The documents included, in part, the Delaware River Basin Compact, the Good Faith Agreement, the DRBC Water Code, DRBC Resolution 85-35, and Merrill Creek Reservoir DRBC docket, summaries of public comments relating to proposed revision of Compact Section 15.1(b) and the proposed metering requirements.

The policy considerations which were taken into account for alternative charging schedules include:

• Good Faith Recommendation 1 established a more strict salinity objective of 150 mg/l of chlorides compared to 180 mg/l at River Mile 98 for the year 2000.

• Recommendation 2 called for the establishment of a water management system capable of providing a reliable water supply for essential uses during the most severe drought of record, 1961-1967.

• Drought operating formulae for the three Delaware Basin New York City Reservoirs were established in Recommendation 3.

• Recommendations 4, 10, 11 and 12 promoted the objective of reducing overall use of fresh water by fifteen percent.

• Recommendation 13 was to develop a program to balance future depletive use with the availability of storage capacity to meet salinity objectives

• The above program also established a "salinity control area" downstream of the Montague, New Jersey gage and upstream of the C & D Canal in Delaware

• The Merrill Creek Owners Group constructed a pump-storage reservoir in Warren, New Jersey to replace the depletive uses of evaporative losses of cooling water by specific power plants in the Basin. Releases would be made from this reservoir whenever the Delaware River flows at Trenton are less than 3,000 cfs

The Compact addresses three topics related to the study. They are (1) the Commission's responsibility and authority to provide for planned water use within the Basin, (2) Its powers during drought emergencies, and (3) its powers to establish fees for water use.

Section 3.7 of the Compact provides that the Commission may set rates and charges for the use of Commission owned facilities and for the use of products and services derived from those facilities. However, Section 15.1 (b) states that there will not be imposed any charge for water withdrawals or diversions of they could have been lawfully made without charge on the effective date of the compact, or prior to October, 1961. This provision has been referred to as the "grandfather clause".

The Commission is further limited by Section 3.5(b) that prohibits it from charging for any water diversion permitted by the U.S. Supreme Court. Accordingly, the Commission does not have the authority to impose charges for diversions made by New York City and New Jersey as provided by the 1954 Supreme Court Decree.

After consideration of the construction costs and higher water charge rates that would be required to pay for the modification of F.E. Walter and Prompton Reservoirs, the Commission decided that the financial burden only on the post-compact water users to pay this new debt would be too large a burden on them. In DRBC Resolution 85-34, it concluded that these water users could not effectively finance the cost of providing a larger supply of safe and secure water. Therefore, the Commission recommended to Congress an amendment of Section 15.1(b) of the Compact which would have required pre-compact water users to also pay water charges that would help finance the modifications to the reservoirs. The charges would include the cost for the annual costs of the Blue Marsh and Beltzville Reservoirs.

Estimated Annual Revenue Requirements

The DRBC intended to cover the cost of building the reservoir modifications and carrying the existing reservoirs annual cost by the sale of tax exempt bonds. The bonds would also have been used to pay the interest costs to cover the short term notes issued during construction. It would also establish a reserve fund equal to one year's bond interest and principal payments, and bond issuance costs.

A summary of the revenue bond requirements are shown in *Table 19 and on* page 55 of the Report. The 1987 total estimate of building the F.E. Walter modification totaled $124 million dollars. The DRBC share of the Prompton modification was $69.5 million dollars if construction began in 1995. However, annual water charge payments for F.E. Walter would reduce the cost for Prompton Reservoir to $52.6 million dollars. With added reserve and interest requirements, the total cost for Prompton would have been $66 million dollars.

TABLE 19
ESTIMATED REVENUE BOND
REQUIREMENTS FOR DRBC RESERVOIRS

	Bond Requirements $
F.E. Walter Reservoir Modification	
Construction Cost	97,100,000
Interest During Construction	12,200,000 (a)
Debt Service Reserve	11,000,000 (b)
Bond Issuance Expense	3,600,000
Total Bond Requirement	123,900,000
Assumed Bond Issue for F. E. Walter	124,000,000
Prompton Reservoir Modification	
Construction Cost	52,600,000 (c)
Interest During Construction	5,500,000 (a)
Debt Service Reserve	5,800,000 (b)

Bond Issuance Expense	1,900,000
Total Bond Requirement	65,800,000
Assumed Bond Issue for Prompton	66,000,000

(a) Estimated interest on short—term notes during three year construction period.

(b) One year's debt service on bonds

(c) Estimated construction cost of $69,500,000 less $16,900,000 of monies accumulated from F. E. Walter debt service coverage requirement.

The annual water charge payment requirement for the two modifications and the current annual cost for the two existing reservoirs totaled $20.6 million dollars. The annual operation, maintenance, and administrative costs for the modified projects were estimated at 20 percent of the bond cost for the projects or a total of about 3.4 million dollars. The annual operation and maintenance cost of the existing reservoirs was estimated to be only $30,000 for 1986. A breakdown of the annual revenue requirement for the four projects is shown in *Table 20 and on* page 57 of the Report.

4.3.5 Water Charge System Principles

The study scope of work required that the proposed alternative charge system be "fair and equitable, as well as practical". The Consultant concluded that the equitability of a water charge system can be measured by the degree that charges differ between users with similar characteristics. An equitable system is one where users with similar characteristics are charged on the same basis. However, the more characteristics there are to consider in determining equability, the more complex the system becomes. Therefore, it concluded that the characteristics must be limited so that the system does not become unwieldy.

4.3.6 Water Charge System Alternatives

Three alternative charging schedules were developed. The relative benefits allocation presented in Part One of the report was referred as Alternative A. Alternative B was developed using the cost causative principles that often applied in the design of utility rate schedules. The Advisory Committee requested that a variation of Alternative A plus Alternative B be developed and this combination was referred to as Alternative C.

The charging schedules were considered as preliminary estimates of charges which would ultimately be required, especially since the cost estimates of construction and operation of the proposed projects were preliminary. Also, the depletive use factors were based on an expanding data base that will change with time.

Policy Considerations
Six policy issues were addressed in the development of the alternative water charge schedules. They include:

- The ratio of charges applicable to post and pre-compact users
- The level of payment associated with the New Jersey diversions
- The practicality of collecting from small users
- The degree of credit that the Merrill Creek Owners Group should receive
- The level of agricultural charges
- The establishment of the location along the Delaware River below which charges are not applicable

1. Charges for Pre-Compact Use
If pre-compact users were allowed to be charged by the Commission, a ratio between the pre-compact and post-compact charges was assumed to be required as part of the water charging schedules.

It was one of the premises of the study that pre and post-Compact users would not pay the same water charge rates because of their different requirements for augmented flows. The consultant calculated a post/pre-compact ratio of 3.3 to 1 in developing the water charge schedule for Alternative B. This was the same ratio that the Commission previously calculated. Because of the limitations of the accuracy of the methods used to develop the ratio, the Commission decided that a post/pre-compact charge ratio of 3 to 1 be used for purposes of this study for all depletive use and withdrawal charges.

2. Charges for New Jersey Diversion
Although the Commission is prohibited by Section 3.5(b) of the Compact from charging for taking water from the New Jersey D&R Canal diversion, this does not prevent New Jersey from agreeing to contribute towards a project that would provide a benefit to the users located there. The Commission directed the consultant to determine charge schedules which assumed New Jersey would contribute at a level equal to the pre-Compact charges applied to 100 percent, 50 percent, 25 percent, and 10 percent of the water diverted by New Jersey.

3. Charging Threshold
Because of the complexity and impracticality of charging small water users such as residential wells, the Commission directed the consultant to use a 100,000 gpd withdrawal exemption for the development of all the water charge schedules options. The policy that would exempt 100,000 gpd from charges for all users, would give each agricultural user “free water” to irrigate about 340 acres with an annual rate of application of four inches of water. This would provide a substantial exemption for small farmers. It was estimated that the exemption policy would reduce the billed units of depletive use by 13 percent and the withdrawal units by 5 percent.

TABLE 20
ESTIMATED ANNUAL REVENUE
REQUIREMENTS FOR DRBC RESERVOIRS

Cost Category	Estimated Annual Revenue Requirements $
Beltzville & Blue Marsh	
Debt Service	864,000 (a)
Operation & Maintenance	30,000 DRBC Background Paper
F. E. Walter	
Debt Service	11,000,000 (b)
Debt Service Coverage and Major Repairs and Replacements	2,200,000 (c)
Operation & Maintenance	100,000 DRBC Background Paper
Interest Earnings on Reserves	(770,000) (d)
Charge Program Administration	406,000 (e)
Subtotal	13,830,000
Prompton	
Debt Service	5,900,000
Debt Service Coverage and Major Repairs and Replacements	1,180,000 (g)
Operation & Maintenance	100,000 Assumed Equal to F.E. Walter
Interest Earnings on Reserves	(410,000)
Subtotal	6,770,000
Total	20,600,000

(a) Scheduled annual capital cost for the period from 1989-2028.
(b) $124,000,000 bond issue (Table 19) with an assumed term of 30 years at an interest rate of 8 percent rounded to the nearest $100,000.
(c) Twenty percent of annual debt service.
(d) Seven percent interest on debt service reserve fund of $11,000,000.
(e) Assumed ten persons plus expenses, adjusted to round total cost to the nearest $100,000.
(f) $66,000,000 bond issue (Table 19) with an assumed term of 30 years at an interest rate of 8 percent rounded to the nearest $100,000.
(g) Twenty percent of annual debt service.
(h) Seven percent interest on debt service reserve fund of $5,900,000.

4. Merrill Creek Owners Group Credit
In considering the credit that the Merrill Creek Owners Group (MCOG) should receive because it constructed its own reservoir which was designed to release flows to make up for depletive use of its associated power plants, the Report recommended that the MCOG receive a five percent credit because the reservoir would release five percent of the days of the 49-year model simulation period. The Commission directed that reduction factors of 52, 75, and 95 percent be applied to the MCOG depletive use when developing the water charge schedules. The Commission has since decided to exempt Merrill Creek from withdrawal charges. Instead, the utilities covered by the Owners Group pay for consumptive use withdrawal unless Merrill Creek is releasing to make up for the generating units depletive use. The utilities pay for nonconsumptive withdrawal regardless of the releases from Merrill Creek.

5. Agricultural Use Charges
Among the public comments after the draft report was published was that the agricultural users felt that water charges could impose severe economic hardships and that agricultural land provides for ground water recharge that is not found in developed areas. The Commission's "Background Paper" stated that "For agricultural users, particularly small farmers, a form of exemption or partial exemption may be considered in light of the groundwater recharge and conservation benefits provided by such users".

Based on these comments by the public and other considerations, the Commission directed that the alternative water charge schedules developed in the study include schedules where agricultural irrigation is charged for: (1) its depletive use which is defined as 90 percent of withdrawals; and for 50 percent of withdrawals. The 50 percent factor was based on the use of a lower depletive use factor, recharge credits, or other conservation credits that may be adopted. The agricultural charges would be billed annually compared to quarterly for most other type of users.

6. Sub-basins Exempt from Charge
Based on salinity computer simulations by the Commission and on the relative benefit studies made in Part One of the report, depletive water use at the extreme downstream end of the Estuary would have minor if any affect on the availability of surface water to other users in the Basin. Also, the water charges to users in the area would be minimal so to make it economically impractical to collect these charges. The Commission directed that no charges be applied to users within Sub-basins 11 and 12, in New Jersey and Delaware, respectively.

Alternative A-Benefits Based Charge
The procedure for the design of the Alternative A water charge schedule is relatively straightforward, is as follows:

- The annual revenue requirement for the four DRBC reservoirs is allocated to each of the benefit categories in proportion to the benefit weight which is used in the relative benefit allocation.

• Determine for each benefit category the total of the users units, such as the annual depletive use or annual water withdrawal, upon which a charge will be applied.

• Divide the revenue requirement allocated to each benefit category by the units of charge recognizing the post/pre-compact charge ratio of 3:1 and the 100,000 gpd charge exemption. This calculation yields the charges to be applied to each benefit category.

The units of charge were basically for either depletive use or non-depletive use withdrawals and may include certain adjustment factors as follows:

• Compensation for Depletive Use, Replacement Factor Applie7d

• Reduced Risk of Restriction of Essential Depletive Use, excluding the New Jersey Diversion and 95 percent of the depletive use for the MCOG

• Increased Supply for Future Depletive Use, excluding depletive use in Sub-basin (above Montague, NJ)

• Salinity Control – The withdrawals of all PRM groundwater and the effective surface withdrawal of all users located between River Mile 118.5 and River Mile 76. There is no differential between pre and post-compact users for salinity control.

• Increased Reliability of Supply – The annual withdrawal of users that withdraw directly from portions of the Delaware and its tributaries that receive flow augmentations.

• Recreation Downstream – No units of charge

The results of this determination are shown in *Table 21* which can be found in the Appendix and on page 71 of the Report.

The schedule of water charges for Alternative A and the formula use for their application are shown in *Table 22* in the Appendix and on page 72 of the Report.

Table 23 shown in the Appendix and on page 73 of the Report shows the projected revenue that would result from each sub-basin and each state by user category.

Table 24 shown in the Appendix and on page 74 of the Report shows examples of the procedures which would be used to calculate the annual charge for two typical users.

Alternative B – Cost Casuative Based Charge

Alternative B focuses on the costs of providing benefits to the users. It utilizes cost causative principles and recovers non-salinity control related costs based on current depletive use and withdrawals, and salinity control related costs by means of the same

salinity control surcharge developed for Alternative A. With this type of charging system, users with identical usage are charged the same regardless of the end use of the water. This method is commonly used in the design of utility rates.

The water and flow release capabilities of the existing and proposed DRBC reservoirs are shown in *Table 25* below, based on computer simulations with the DRBC reservoir model.

Table 25
DRBC RESERVOIR YIELDS

Reservoir	Total Yield, cfs
Blue Marsh	65
Beltzville	130
F.E. Walter (Mod)	290
Prompton (Mod)	130
Total Yield	615 cfs

For cost causative rate purposes water released from the DRBC reservoirs may be regarded as providing for four types of use. They are:

- provision of depletive use compensation for current water users
- Provision of depletive use compensation for pre-Compact users which is not fully met without augmentation by a DRBC reservoir
- Provision of depletive use compensation for future increases in depletive use by with pre or post-compact users; and
- Salinity control

The Commission had not determined the quantity of water that will be available for future use. An assumption was made that the rate of increase of depletive use between 1986 and the year 2000 would be one percent annually. This would require a reservoir yield of about 130 cfs.

Table 26 shown below and on page 78 of the Report summarizes the allocation of reservoir yield to type of use and gives the equations to calculate the basic post/pre-Compact water charge ratio which resulted in a 3.3 to 1 ratio. However, due to the assumptions used and the accuracy of the water use inventory, the DRBC directed the use of a 3 to1 ratio.

Design of Alternative B Water Charge Schedules

The Alternative B type water charge consists of a pre- and post-compact depletive use and withdrawal charges and a salinity control surcharge. The users depletive use is first adjusted to reflect equivalent impact factors and also for the 100,000 gpd threshold.

The Commissioners directed that a withdrawal or non-consumptive use charge, based on a fixed ratio of the depletive use charge, be included in the Alternative B water charge schedules. Such a charge recognizes the value of being able to withdraw water even though the water is not depleted. The Commission's current charging regulations uses a factor of one percent or 1/100 ratio of the water withdrawn.

TABLE 26
CALCULATION OF POST/PRE WATER CHARGE RATIO

DRBC Reservoir Yield Allocation

Current Post Compact Requirement	221 cfs (a)	A
Current Pre Compact Requirement	114 cfs (b)	B
Future Use	130 cfs (c)	C
Salinity Control Requirement	150 cfs (d)	D

Total Yield	615 cfs (e)	E

Current Depletive Water Use

Post Compact Use	147 cfs	F
Pre Compact Use	398 cfs	G

Total Depletive Use	545 cfs	H

Basic Post/Pre Compact Water Charge Ratio

Percentage Responsibility of Post Compact Users = *((*A/E*)* + ((C/E)*(F/H)))*100 =41.6%

Percentage Responsibility of Pre Compact Users = ((B/E) + ((C/E)*(G/H)))*100 = 34.0%

Post/Pre Compact Water Charge Ratio = G*41.6%/F*34.0% = 3.3

(a) Current average annual post compact depletive use (including relative impact factor adjustments) times a storage quantity factor of 1.5.
(b) Total allocated yield for depletive use, 335 cfs, less post compact allocated yield for depletive use.
(c) Allocated yield for future depletive use.
(d) Allocated yield used to offset sea level rise.
(e) DRBC 120—day reservoir yield.

Options of a ratio of 1/50th or 1/100th of the depletive use charge were used in developing the charge schedules. The projected revenue to be recovered by the salinity control surcharge is equal to 24 percent (130/615 cfs) of the total annual revenue requirement. The remainder of the annual revenue requirement must come from the depletive use and withdrawal charge.

Table 27 shown in the Appendix and on page 81 of the Report, presents a schedule of water charges for Alternative B1 with the use of three instead of four reservoirs (excluding Prompton).

Alternative B1 assumed that the New Jersey diversion would be at a one hundred percent depletive use, the 100,000 gpd threshold was in place, the agricultural irrigation depletive use is at 90 percent and the MCOG payment is based on 95 percent. The withdrawal charge for Alternative B1 was set at 1/100th of the depletive use charge.

Alternative B1 can be looked at as the base charge schedule which reflects the policy considerations previously discussed. The charging schedule for this alternative determined that the pre-Compact use would be charged $56 per million gallons of depletive use and that all post-Compact depletive use at three times that rate or $168 per million gallons. Assuming these charge rates and all users are charged a withdrawal charge or non-depletive use of one percent (0.0l) of their depletive use charge, a total of $10.45 million dollars would be received annually. This amount plus the estimated $3.348 million dollars accrued from the salinity surcharge would total $13.78 million dollars. This amount essentially meets the project $13.83 million dollars annual revenue requirement for the two existing reservoirs plus the F.E. Walter modification. These calculations are shown in *Table 28* and on page 82 of the Report. The annual revenue requirement to include the Prompton modification would be about 50 percent higher, to nearly $20 million dollars.

Thirteen water schedule alternatives, selected by the Commissioners, were developed for the Alternative B type of charge. These alternatives are summarized in *Table* 29 in the Appendix and on page 84 of the Report.

Alternative C – Advisory Committee Alternatives

After reviewing the consultant's preliminary report, the Advisory Committee requested that eight additional charging schedules be developed. These schedules are similar in format to the Alternative A benefits based charges, except there was no benefit assignment for future depletive use and users in New York State were exempt from all charges. The Advisory Committee further requested that charges be developed for only three reservoirs, excluding Prompton. For the purposes of determining Alternative C charges, the percentage distribution for the annual revenue requirement to the various benefit categories is in proportion to the Alternative A distribution, excluding the future use benefit category. *Table 30* shown in the Appendix and on page 87 of the Report presents a summary of these alternative charge schedules requested by the Advisory Committee.

System Development Charge

The proposed DRBC reservoir projects were intended to provide sufficient reservoir yield so that water is available for increased depletive water use. A weighting of 20 percent of the total benefits in Part One was given to future depletive use. It recognized that about 20 percent of the yield of four reservoirs could be available to future use compensation. This means that a portion of the charges proposed many of the water charge schedules previously presented represents the cost of providing the capability of increased deplete use with in the basin. Because the current water users would be the only initial source of funding the additional depletive use, new users may receive benefits from projects for which they had not contributed.

A fairer system that is commonly used by utilities is to institute a system charge for new users for at least a portion of the costs the current users have borne. This charge should be structured that it would recover the costs of providing and holding reservoir capacity, but not so high that it would discourage new users from locating within the basin.

A format was suggested in the report to help determine a system charge for the DRBC. The total system development charge could equal the sum of the annual charges, less that portion of the charge that are related to future use, that the user would have paid as if they were a user when the water charge system commenced. Since this charge could be substantial, it was suggested that the DRBC may allow the user to amortize the payments over a period of several years. This policy would lessen the immediate financial impact on new users.

A certain level of usage must be assumed for the new user to implement the system charge. It could be based on the first full year of water use or on the user's water allocation. This type of charge could reduce the future charges to existing users. Because existing users would only be charged a system charge when requesting additional water allocations, the potential impact of this is charge to them is considered to be small.

Evaluation of Alternative Water Charge Schedules

The advantages and disadvantages of each of three basic types of water charge schedules which were presented in the report are evaluated below.

The implementation of any of the water charge alternatives presented in the report would require substantial effort. The effort would include the identification of all the users to be charged, their water withdrawal, depletive use factors, and whether the use is pre- or post-compact. All users below River Mile 92.5 must be assigned a relative impact factor. If all small users were to be included in the charging system, i.e. the 100,000 gpd exemption was not approved, a very large effort would be required to incorporate them into the data base and thus present a major disadvantage for such charging systems.

For Alternative A or C type charges, users withdrawing from the three or four reservoir-augmented streams must be identified. Users within the salinity control area would also need to be identified with any of the alternatives.

The Consultant's report recommended that once a water charge schedule is implemented that it would need to be revised periodically, perhaps annually, so that the annual cost and revenues would remain in balance. This would be to keep the current differences among users that pay different charges to be recognized properly. Because Alternative B charging schedule is based on the allocation of a known quantity of reservoir yield and not on a relative benefit allocation, there may be a small advantage in using this alternative for charging from a view of less complexity.

From an equity point of view, all of the major types of charge systems that were presented in the report were regarded as equitable, even though the user characteristics considered by each system were somewhat different. Alternative B does not give special consideration for increased supply for future use, increased reliability of supply, decreased risk of restrictions on essential use, and improved downstream recreation. The consideration of the different charging systems does result in charges that vary considerably; however, the consultant's opinion was that each water charge schedule is equitable.