Q. Please explain the first of your objections. What's wrong with using meter sizes to define customer classes?

A. The Company proposes to base both the level of the customer charge and the volumetric structure of the inclining blocks on meter size. Assuming you want customer classes at all (and, as I explain later, they are not needed) it is unnecessary to base them on meter size. As the Company acknowledges, "there is a strong correlation between the consumption level of customers and the size of the meter." [Gradilone Direct, p. 6.] In other words, customers with large (6"-8") meters use a lot more water than customers with small (5/8") meters. (This would follow, wouldn't it, from the fact that if you use a lot of water you need a big pipe to supply it, and the meter would have to be sized to the pipe.) In short, meter size is a way of arbitrarily creating classes along the continuum of water customers defined volumetrically. Then, once it has these classes, the Company can differentiate its customer charges and block levels on that basis. But there is no need to do this. Segmenting the customer base by meter size is an essentially artificial exercise in complexity.

Q. But doesn't United's inclining block system require different base, shoulder, and peak levels for each meter class?

A. Yes, as it is set up. But this is not a necessary structure. In fact, the structure could be imposed, if you wanted it, purely on the basis of historical consumption levels. As noted above, these correlate very well with meter size. It's chicken and egg. That's not really the core issue. The core issue is whether you need to segment the customer base at all. If the intent of the rate design is not only to "send the proper signals to consumers," but also to achieve the maximum effective response to those signals, then each consumer can be in effect a class of one, and changes in that consumer's rates can be pegged to changes in that consumer's usage.

Q. Are you saying that any system of classes based on general usage levels is unnecessary?

A. Yes. That's the second step back that I was referring to earlier. All class breaks are arbitrary from the perspective of individual customers; yet they affect various members of the same class in different ways. A customer whose normal usage is at the low end of a given class can increase his

usage substantially without incurring a rate increase ###Present Dairy Gold Example###, whereas a customer whose normal usage is near the break point at the top of the block will incur an increase in marginal rate with only a minor increase in usage. Furthermore, because both customer charges and block volume norms are tied to meter size, a change in meter size can really impact a customer's bill. ###Make up a shift of Dairy Gold to 2 meters### There is no economic justification for this situation; rate design should motivate customers to conserve usage, not to switch meters.

Q. Your third objection to the Company's proposals concerned the abandonment of the winter/summer differential. Would you explain?

A. Yes. The problem with the existing rate design is not found in the fact that it distinguishes winter and summer; higher usage in summer creates system peaks that impose added costs on the system, and it is entirely proper to recover these from the users whose higher usage causes the system peak. The problem with the current rate design is that it charges everybody more in the summer--as the Company says,

> ... if a customer has minimized his or her consumption in both winter and summer, there is some inconsistency in what the summer/winter rates are trying to accomplish when the customer pays more for the same volume in the summer. [Linam Direct, p. 3.]

The Company's proposed rate design solves this problem, but it creates a complementary problem, because it charges a higher rate in winter to a customer with higher winter usage than summer usage. The customer pays a higher rate in winter even though the higher usage that triggers it occurs off the system peak and is therefore economically efficient and desirable. In other words, United's inverted block system, while it may send the right signals in summer, would send erroneous pricing signals in winter--discouraging the added off-peak usage that could efficiently add to the Company's revenues from consumption and reduce the need for high customer charges.

Q. Dr. Reading, in your opinion, is there a reasonable and administratively feasible rate design that will recover United's revenue requirement equitably and still provide consumers with the proper pricing signals all year round?

A. Yes. I will propose such a rate design in the next section of my testimony.

2. Irrigation and Non-irrigation water charges

Q. Please turn to the third section of your testimony, describing your alternative rate design proposal. Dr. Reading, would you begin by explaining how you developed this proposal?

A. Yes. The rate design here adopts the results of the cost-of-service study presented in Mr. Gradilone's testimony and schedules. The Company's total metered sales revenue requirement, as approved by the revenue requirement phase (UWI-W-97-6), is $22,834,990. After adjusting for decreased Micron sales the Company uses a revenue amount of $22,824,840 to be spread for tariff design. This amount excludes fire protection and other revenues. The Company's cost-of-service study indicates $6,911,745 of total revenue requirement should be recovered via customer charges. For the purposes of our rate design proposal we will accept the Company's adjustments for Micron, fire protection and other revenues. We will also accept the $6,911,745 for recovery in customer charges. Should the Commission make any adjustments to this revenue allocation our method could be easily adjusted. The monthly consumption data presented in Exhibit 2, Schedule 28 attached to Mr. Gradilone's testimony are also used to design the rates and calculate the Company's monthly charges.

Q. First, would you briefly explain the basis of your proposed rate design?

A. Yes. Each customer's bimonthly bill would have two basic parts–a uniform flat customer charge, and a commodity charge based on periodic water consumption. The commodity charge in its turn may have two parts--a basic water rate and an irrigation water rate. Whether a customer has any water charged at the higher irrigation rate would depend on the relationship between that customer's last year's usage during the base months and his/her usage during the summer peak

In other words, instead of United's customer class system based on meter size, I propose a functional distinction based on differential seasonal usage. Consumption increases during the summer months in excess of a specified percentage of the base usage will be classified as irrigation water and charged at a higher Irrigation Rate.

Q. How would the base usage for each customer be determined?

A. January, February, March, and April have the lowest usages of the year; therefore, they should underlie the base-use factor. Total consumption for these four months is 2,707,974 hundred cubic feet (CCF), yielding an average monthly base use of 676,993 CCF and an estimated annual base use of 8,123,922 CCF. This estimate of annual base use is 47.3% of the Company's water sales of 16,722,721 CCF; hence, 47.3% becomes the base-use factor in determining the two commodity rates.

Q. Let's be clear. Are you proposing that there be two classes of customers, Irrigation and Non-Irrigation?

A. No. There is just one class of customers; there are two commodity rates--a basic water rate for normal usage, and an irrigation water rate for excess usage.

Q. Does the basic rate apply only to the customer's base use as established during the winter months?

A. No. As shown in the Company's Exhibit 2, Schedules 2, 3, and 4, normal usage will rise with the temperature--that is, everyone uses more water in the warmer months, whether they irrigate or not. The rate structure needs to allow for that, and it does. As proposed, the basic water rate will apply to base-use levels during the base months (January-April), to base-use + 10% during the shoulder months (May-June, November-December), and to base-use + 20% during the peak months (July-September). As shown on Exhibit X, Schedule 3, at current usage levels, the Basic Usage Rate would apply to 2,707,972 CCF in the winter, 2,978,769 CCF in the shoulder months, and 3,249,566 CCF in the summer, for a total of 8,936308 CCF, or 52% of annual usage. The other 48% of usage, or 8,235,032, would be charged at the higher Irrigation Rate.

Q. Please explain your proposed Basic Water Rate and Irrigation Water Rate.

A. The Company reports that it needs to recover approximately $16 million in commodity charges. At a single undifferentiated rate on 17, 171,340 CCF, that comes to about $.93 per CCF. But I propose to charge customers a 50% premium for irrigation water, as defined above. Given that the annualized ratio of basic usage to irrigation usage is 52/48, a 50% premium for irrigation usage means that 42% ($6.71 million) of the requirement must be recovered from basic usage and 58% ($9.29 million) from irrigation usage (see Exhibit X, Schedule 4). This sets the basic rate at $.75 per CCF and the irrigation rate at $1.13 per CCF.

Allocated at Base + 10% +20%

17,171,340	CCF	Total usage recovering	$16,000,000	@	$.93
8,936,308	CCF	Basic usage recovering	6,710,000	@	$.75
8,235,032	CCF	Irrigation usage recovering	9,290,000	@	$1.13

Q. You have allocated the commodity portion of the revenue requirement entirely to the two rates. But won't United's revenues fall short of the authorized amount as irrigation water users begin to conserve in response to the pricing signals?

A. If United's customer base were static, yes, conservation would create a revenue shortfall. For instance, if Irrigation usage fell 10%, from 8,235,032 CCF to 7,411,529 CCF, revenues would fall by (823,503 x $1.13) or $930,559. This is about 5.8% of the revenue requirement. In an otherwise static economy, such a shortfall would require a reallocation to increase either or both of the rates. If the burden for making up the shortfall fell entirely on the Irrigation rate (the best solution), that rate would increase from $1.13 per CCF to $1.25, while the Basic rate would remain unchanged at $.75. In fact, as long as consumption continued to fall while the revenue requirement stayed the same, rates would have to escalate.

Q. Is this a realistic scenario?

A. No. In a static model, a change in one term forces a change in at least one other term as well. If consumption shrinks while the revenue requirement remains constant (as in the example), higher rates are inevitable. But such a static model is misleading in the real world. The very fact that price incentives can be applied assumes that the customer base is growing and that conservation is needed in order to help allocate limited resources. It is unrealistic to think otherwise.

That is, if the customer base and the revenue requirement were fixed, and the consumption level declined, at least some rate would have to rise. But neither condition is necessary. The customer base can expand, and the revenue requirement can contract--either or both. Although the Company refers to a "reconciliation of revenues ... lost to conservation" [Gradilone Direct, p. 7.], it doubtless expects its customer base to grow; its cooperation in conservation efforts is obviously buttressed by the prospect that an expanding customer base will at least maintain current revenues even while average per-unit rates are going down. Furthermore, to the extent that conservation allows present production to satisfy future needs, it relieves pressure for plant expansion. Without the need for new construction, United's rate base will decline over time, and the revenue requirement with it. The goal of my proposed rate design is not to reduce water usage in the absolute but to reduce the amount of potable water wastefully being used for irrigation. The higher price of excess usage should induce some heavy users to find cheaper sources of water for irrigation; it should move others to replace their thirsty lawn grasses with native ground covers. The water thus saved can then be used to service Boise's continued growth and limit the need for new, high-priced production plant.

Q. Do population and construction trends provide support for this expectation of growth?

A. Yes. The Company expects households in its service area to increase at an average of more than 1,600 per year for the 10 year period from 1995 to 2005. During this same time period the Company forecast an increase in water consumption of 8.2 million gallons per day or an increase of 24%.

Q. Let's return to the issue of the Customer Charge. What do you propose?

A. The Company's revenue requirement to be recovered from customer charges is approximately

$7,000,000. I propose spreading this revenue requirement evenly over an estimated 55,204 customers. With a bimonthly billing system, that yields a flat rate of $21.13 per bill per customer. [Water Conservation Plan, August 1993.]

Q. The Company proposes to link its Customer Charge to meter size, with bimonthly charges ranging from a low of $18.39 (5/8" meter) to a high of $364.09. [Gradilone Exhibit 2, Schedule 29.] Is this reasonable?

A. No. As the Company has acknowledged, meter size is highly correlated with usage level. It is thus redundant to usage charges, which are by CCF. A customer charge is properly applied to each customer for the provision of basic customer related services, such as billing, meter reading, service, and fire protection, which are essentially insensitive to the level of usage. The quality or quantity of these services provided to each customer is not based on a customer's consumption.

The Company's method for the determination of customer charges for a given meter size is to apply a ratio of relative capacity of each size of meter. As shown in Company witness Palko's Schedule 8, page 1, a 6" meter is allocated customer costs that are 50 times greater than a 5/8" meter because the meter can handle 50 times more water. However this has no relation to customer charges such as billing or meter reading. The Company states that they do this to, "allow for the fact that customer costs generally vary and increase with the size of the individual customer's meter and service."[Palko, Di, p. 11.] The Company provides no other justification for charging a higher customer charge for larger meters. In the final rates offered in this Docket the Company proposes that a 6" meter has a customer charge 13 times higher than a 5/8" meter. Given that a meter is appropriately sized to suit a customer's needs and estimated usage, meter size should not be associated with customer charges that have nothing to do with consumption patterns.

Q. Why do you think your plan is better than the Company's plan?

A. In the first place, it's much easier for customers to understand. A uniform customer charge and uniform rates for basic and excess usage don't require much explanation. The Company's proposed system of meter classes and usage blocks can be very confusing. The problem we're

facing--excessive usage in the summer months--is not complicated, and fixing it shouldn't be complicated either.

Second, because it is simple and straightforward, my proposed rate design sends the clear price signals to the people who need to get them--the people whose summer usage is much higher than their winter usage. With certain exceptions, these people are using more water because they're irrigating with it, and that's wasteful of our scarce resource of potable water. Charging a serious premium for this irrigation usage is the most effective way I know to get their attention and change their behavior. And that's what we want to do. It is a needless complication to have people checking their meter size and looking up their place in a rate table to see what their rate is now and what it could be if they changed out their meter.

Third, my proposed rate design eliminates the summer/winter problem inherent in the Company's proposed rates. United's block rate design charges high volume winter users as much as it charges high volume summer users, even though the winter use is off-peak and economically desirable. This can't happen under my proposal, because each customer's winter usage is the benchmark for that customer and that customer only.

Fourth, by reinforcing the fact that the excess usage is irrigation related, my rate design makes customers understand their part in the problem and encourages dual water systems for irrigation. People will get the message that the way to have a green lawn without a high water bill is to install a sprinkler system that doesn't draw from the potable water supply.

Q. Can dual water systems mitigate the problem?

A. Yes. Urban irrigation systems are a proven method of keeping the parks, gardens, and lawns green while preserving the dwindling supply of ground water. This Commission has actively encouraged conservation measures for many of the utilities it regulates. As I stated in my testimony in Case No. UWI-W-96-4, I view urban irrigation systems as an important way of stretching the supply of potable water, one that United Water and this Commission should actively consider and encourage. Once consumers see their summer water bills shoot up, they should be more receptive to programs that help them install irrigation systems, and the Company and Commission should be prepared to foster such solutions.

Q. What objections could be raised to the rate design you propose?

A. One objection might be that the 50% premium on irrigation water is too extreme and could produce rate shock. Although I don't necessarily agree, since a strong price signal is needed to get many users' attention, it is always possible to phase in the higher irrigation rate over two or three years. Of course, this would mean that the Basic rate would initially be higher than the $.75 CCF I have proposed.

Q. Your proposal in effect makes each user a rate class of one, since the higher Irrigation rate is triggered by a percentage rise in the individual user's consumption level. Isn't this administratively cumbersome?

A. Not at all. The City of Boise already identifies individual UWI customers and computes a base water use for each in order to calculate sewer bills. The fit is not exact, since not all UWI customers are City sewer customers ###and vice versa???###; however, the procedures in place can be readily extended to all UWI customers. That is, the Company's billing system can easily piggyback on the existing City sewage charge billing system, which already tracks individual usage. The computerization of the billing system allows each customer to be a class of one.

Q. Please briefly explain how the City of Boise uses United customer water usage data to establish the City's sewer bills.

. Each year the City receives from UWI water usage data for all customers in the overlapping service territories for the two billing periods (four months of usage) immediately prior to April 1. The City then matches UWI customer data to its customer sewer accounts and computes a monthly base use for each customer (simply by dividing the four-month bill by four). This average base monthly use is the standard for the calculation of the sewer rate for that customer. It is assumed that this base use consumption literally goes down the drain and is therefore what is run through the sewer system.

Q. This procedure sounds a lot like the one you described above for establishing the Basic water rate. Could you describe any differences?

A. Yes. While the City bills are based on an average for four winter months, as described above, my proposed rate design allows for the natural increase in water use during shoulder and peak summer months. Thus before water would be considered in the irrigation category, increased summer use is taken into account. With this difference the approach is the same and based on the same data that the City uses.

Q. It could also be objected that a billing system based on historical site usage fails to allow for new service or for changes in household or business usage that are not irrigation related. Is this true?

A. Yes, but the problem is not insuperable. Both new service and usage changes due to exogenous factors are accommodated in the City's sewer charge system and can be adapted to the Company's water billing system. There are three major categories that the City has found need special attention.

New Units: At the time a unit with no history of water use is first hooked up, the City determines the number of individuals living in that unit and estimates the usage (see attached Boise City Public Works Regulations) until actual water use can be calculated.

Change In Number Of Individuals In Unit: If the number of individuals living in a dwelling unit changes, the water usage also changes. If this change is substantial, it could lead to an incorrect classification of the unit's water use. Again, when this occurs the City uses the number of individuals living in a resident to estimate water use until new consumption data can be obtained.

Leaks: A leak that goes undiscovered for a significant period of time can impact water usage sufficiently to affect the marginal price. The City requires the home or business owner to show the city the plumber's bill and then makes the necessary adjustments.

While it may sound, at first blush, to be a complicated and unreasonable requirement for

UWI to base bills on individual consumption patterns, it should be realized that the City has been successfully using this approach for some time. We are simply proposing to mirror the City's approach.