January 9, 2024

Mr. Tim Carroll, Board Member
Inyokern Community Services District
1429 Broadway
P O Box 1418
Inyokern Ca 93527-1418

Subject: Water Rate Analysis Report

Dear Mr. Carroll:

Attached is the District's water rate analysis report. Before I address the report, I want to speak to everyone who will read this.

Early on I contacted Bonnie Minnis and gathered some of the District's data. Later, you became my main contact with the District. Both of you have been wonderful to deal with. Thank you so much for helping me help the District.

Now, on to the report.

The key point of the report is this – the utility is "broke." You must move quickly to adopt new, higher rates, ramp up water metering and take other measures to assure the system does not fail the ratepayers. The size of the rate increases will be difficult for some. But the alternative, having the system fail customers, is far worse.

My advice is, move quickly to adopt one of the two sets of rates in the report, or a set of rates close to them. Later, you can delve into the finer points of rate structuring and more.

My proposal includes meeting options in-person and on-line. I am scheduled to meet with the Board January 10. I look forward to that. I want to make sure you understand my findings and recommendations, so you can set rates accurately, quickly, and fund the utility appropriately.

Finally, I am sure you and other Board members know of other districts and utilities that also need rate setting help. As you run into these folks at rural water association meetings and other venues, I hope you will tell them about my services. I get much of my business from referrals by past clients. I hope to be able to trace several future clients back to my work with the Inyokern Community Services District, as well.

Best regards,
GettingGreatRates.com

Carl E. Brown
President

Enclosure

Water Rate Analysis Report 2

Inyokern Community Services District

Inyokern, California

Prepared January 9, 2024

Carl Brown, President
GettingGreatRates.com, LLC

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Executive Summary

The Inyokern Community Services District has run out of reserves. The enclosed model and this report are intended to help you correct that situation as fast as possible and do it with a cost-to-serve rate structure, although gaps in data prevent a fine-tuned analysis of such rates. Overall, revenues need to rise by a bit more than double, but again, missing data prevents being more specific.

This Report is a Utility Triage Effort

The Inyokern Community Services District, Inyokern, California, later just called the "District," or "you," hired GettingGreatRates.com, later called "me," or "I," to perform rate analysis of its water utility; to produce a report of my findings and recommendations; and to provide guidance on rate setting. (You hired me for the same kind of analysis in 2012, though my company name back then was "Carl Brown Consulting.")

Because the District recently exhausted its reserves, this report and the modeling are aimed at giving you enough information and guidance to quickly adjust rates on an emergency basis. If and as more detailed data becomes available over the next few months, I will write another report, if needed, to fill in any gaps. More likely, you will be able to call me, tell me how the new rates are working and if changes are needed, I will be able to just describe that to you. My recommendation then and now will be the same – adjust rates as soon as possible to turn the negative net revenues situation around. And later fine tune, if indicated.

The Models

I modeled your incomes, expenses, customer rates and usage, and many more things in a spreadsheet template. The template is the same as the one I used in 2012, though I have improved it a lot over the last 11 years. There are two rate models, named and described like this:

- "Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2." In the report I have shortened that to just, "Model 2." Model 2 performs complex mathematics to arrive at the initial rates you should adopt and projects their performance over the next ten years. Importantly, Model 2 depicts a level minimum charge regardless of meter size.
- "Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3." In the report I have shortened that to just, "Model 3." Importantly, Model 3 depicts minimum charges that rise with meter size based upon the peak flow capacity of each meter size.

Both structures are calculated to achieve the same target reserve level, so either structure will serve you well financially.

I commonly recommend the rate structure from Model 3, but because the District must quickly adjust rates to correct its financial situation, a level minimum charge (Model 2) would be simpler to understand and perhaps quicker to adopt. Either structure would serve you well at this early stage, so the structure you choose is just that, a matter of choice. But choose quickly. In the next year or two, once you have corrected the financial situation, you may want to fine tune the rate structure. Having your base models built, I can help you with that if you like.

Data Gaps

The District experiences sandstorms. They tend to bury water meters, making them unreadable. Without meter readings, many customers have been billed the monthly minimum charge, but nothing for usage. This caused revenues to plumet. And without those meter readings, I cannot, with a high degree of certainty, calculate revenues that a new unit charge structure would generate.

In addition, the District does not have financial data and statements that I need to analyze incomes and expenses in detail. The closest I can get to that is Tim Carroll's estimate of the total water volume that should be billable going forward in the next few months combined with his estimation of total system operating expenses, user charge fees to collect and shared tax receipts.

That is the gloomy part of the lack of data story.

Fortunately, I had done a rate analysis for the District in 2012. That analysis included cost classification, which is needed for calculating cost-to-serve minimum and unit charges. For the current analysis, I used the overall fixed versus variable cost split from the previous analysis as the split for the estimated total operating cost now. Thus, the costs are higher now and they may well be of a different nature, but the past split between fixed and variable costs should a good stand-in classification rate for triage purposes now.

Mr. Carroll told me that some properties in the District had been dropped from the property tax rolls but are being placed back on the tax rolls. Calculation of those taxes is being done, so the next time tax receipts are distributed, the District should receive more shared taxes than it had been receiving.

In addition, Mr. Carroll had a solid master metered water production volume for me, and he estimates that, over the next few months customer usage, because of better meter access and meter readings, should ramp up from the initial value to something higher. The initial billed volume he gave me is 50 percent of the master metered flow (well production). Given your line leakage problem, that seems like a safe estimate to me, too. Mr. Carroll believes the billed volume rate should climb higher than that as you read more meters.

As the saying goes, "The meter is the cash register for a water system." You need to get all meters cleared and readable just as soon as possible. If billable use ramps up, and I suspect it will, you should bill for more volume and that will increase revenues. Thus, the rates I have calculated should be the "worst-case scenario." As new and increased revenues show up, they will enable you to erase the negative reserves problem quicker. If they are high enough in the out years, you may be able to slow down future inflationary increases.

To be clear, what I am saying is this. Do not adopt lower rates than I have recommended because you hope for more revenue to roll in. Instead, adopt the recommended rates, then watch the utility's net revenue performance. If net revenue is markedly higher than projected in the models and reserves grow markedly higher than recommended, slow down future increases to allow inflation to lower future reserves.

Ratepayers ask, "Why should I pay more?"

Nearly every ratepayer served by every one of my client systems wants to keep their current (lower) rates. No one wants to pay more for their water than someone "down the road." That is human nature. We are wired that way, and that is not a bad thing.

For most of my client systems, I describe some logical but rather boring reasons to accept new, higher rates. In your case, the justification is simple. Without a marked rate increase, the utility will fail, financially. If the utility cannot pay its bills, customers will not get water. Habitable properties are worth a lot more when they have water, than when they do not.

Finally, I modeled unit charges in a level structure with no usage allowance. That is as close as I can mathematically get to the current conservation rate structure. I am not concerned about this rate structure switch for a few reasons. First, I calculated the average use per month per customer and that amount came out at 1,399 cubic feet. In the current conservation rates structure, the second volume block, where the unit charge goes up, starts at 1,600 cubic feet. Of course, not all customers use water at the average monthly rate. Some use more. But the pricing differential between the rate blocks is so small, usually four pennies or so, that higher volume customers are not paying much more than the initial rate anyway. Thus, due to data problems and the small pricing increases in the current rate structure, and the urgent need to increase revenues markedly and quickly, I recommend you initially adopt the modeled level unit charge structure.

If, in a few months, after you establish a longer history of meter readings and get a better "read" on where use will settle in, you can consider going back to a conservation rates structure if you like. But the unit charge rate needs to rise so much right now, I believe that will cause significant conservation anyway. I feel it is safer to adopt a level unit charge now than to speculate on usage and a new set of conservation rates.

In the rest of this report, I discuss the modeled rates and how to adopt them. Then I cover the basis for my recommendations. After that I will bring in more detail and the finer points of the analysis and my recommendations.

Model Discussion

How to Implement the Model 2 Rates

In the following, I summarize most things you would need to do to get set on this course of rates. In Table A that follows, I list the rates and fees you would adopt initially:

1. The table that follows this list states the rates and fees derived from Model 2. I call this set of adjustments the "initial rate adjustment."
2. The calculations assumed you would have made the initial user charge rate adjustments early enough to begin charging at the new rates starting with the bills that will be payable on or about March 1, 2024. You would need to satisfy all Statutory requirements for making rate adjustments in advance of billing at the adjusted rates.
3. Inflationary style increases to the monthly user charge rates should start the year following the initial adjustments, starting in 2025. Model 2 assumes you will make inflationary increases like this:
    a) In 2025, minimum and unit charges would be increased across the board by 4.0 percent, assuming the 2025 budget will be 4.0 percent higher than the previous year's expenses. If inflation is higher or lower than that, adjust rates to match that. If the billing rate or some other change increases revenues markedly, perhaps you should adjust the inflationary increase downward. More likely, you should be more conservative and wait another year to see if the improvement is a trend or a one-time event.
    b) In following years, adjust minimum and unit charges in the same manner.
4. When making inflationary increases, you should examine the costs and incomes the utility experienced during the then current year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of Model 2 for the year in question:
    a) If all criteria are performing close to the values in Model 2, raise all rates by the above percentages.
    b) If criteria are not performing as shown in the above tables, but they are not egregiously different, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly, adjusting for variations in incomes, costs, etc. Download that book for free from https://gettinggreatrates.com/Freebies.
    c) If any criterion is performing poorly by an amount that is troubling to you (balances too low, incomes too low, expenses too high), call me to discuss the situation. It is likely I will be able to "talk you through" how to make appropriate rate adjustments to correct the situation. If not, I can do a model revision for a small fee.
5. Repeat Number 4 each following year until you have raised rates and fees by a total of 20 percent. If all major assumptions come to pass, you would need a new rate analysis in about five years. When rate analysis time arrives, have me or another rate analyst of your choice perform a new rate analysis.

Table A: Rates From Model 2

Table A: Minimum and Unit Charges; No Usage Allowance and No System Development Fee, Calculated by the Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2		
Customer Type	Monthly Minimum Charge, Including Peak Capacity	Unit Charge per 100 Cubic Feet
Metered Water	$43.61	$4.72
Bulk Water	$0.00	$20.12

How to Implement the Model 3 Rates

The process of implementing this alternative set of rates is exactly the same as described above. The only difference is the set of rates to adopt, which are shown in Table B.

Table B: Rates From Model 3

Table B: Minimum and Unit Charges; No Usage Allowance and No System Development Fee, Calculated by the Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3		
Water Meter Size in Inches	Monthly Minimum Charge, Including Peak Capacity	Unit Charge per 100 Cubic Feet
0.625	$40.77	$4.93
0.750	$40.77	$4.93
1.000	$50.19	$4.93
1.500	$65.89	$4.93
2.000	$84.73	$4.93
2.500	$112.98	$4.93
3.000	$134.96	$4.93
4.000	$191.48	$4.93
6.000	$348.46	$4.93
Bulk Water	$0.00	$21.02

Discussion of Both Sets of Rates

The following discussion applies to both sets of rates except where I bring out differences. And because many of the tables include the same data and show the same results in both models, I did not show those tables again in Model 3.

Rate Affordability

I calculate each rate analysis client's rate affordability, measured by the Affordability Index. For most utilities, it is a very useful tool to assess how cheap or expensive their rates will be. The Affordability Index is also used by many grant and loan programs to determine if an applicant will be awarded a grant, how much grant, an interest subsidized loan or no funding assistance at all.

Affordability Index: The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. The Affordability index is a primary factor in determining grant and loan eligibility and grant amount.

Income growth, as determined by the Census Bureau, averaged 3.58 percent per year over the last 21 years through 2021. Incomes and income growth rates are shown in the top left corner of Table 3, page 38.

System-wide water use in the District averaged 10,468 gallons per month. That is well above the national use benchmark for affordability of 5,000 gallons per month. But it no doubt includes use by some customers that are not residential. And since use for most customers was not billed for during the test year, I expect many customers used more water than they normally would if they had to pay a unit charge for it. That said, the Affordability Index in Table 17, page 50, and shown graphically in Chart 4, page 54, is still a good indicator of affordability.

In the table, the Affordability Index calculation for the test year for the District was 0.74 percent. That means, a 5,000 gallons per month residential customer earning at the District-wide median household income level paid 0.74 percent of their monthly household income to pay their monthly water bill. The national average is thought to be approximately 1.0 percent, so your current rates are more affordable than the national average on that basis.

Under the Model 2 rates for fiscal year 2024, the first full year at the new rates, this customer's Affordability Index would go up to 1.37 percent. The Affordability Index for the Model 3 rates would be 1.35, not very different. In future years, the Affordability Index will continue to rise slowly, if Census projections are accurate.

The Affordability Index does not depict how new rates will affect customers using different volumes, or those using markedly more or less volume. Under both sets of rates, all bills will go up, but not equally. Table 18, page 52 for the Model 2 rates and page 68 for the Model 3 rates, show "before and after" bills for customers using different volumes of water. This table is one of the few tables from the models that I recommend you copy and bring to the Board meeting as a handout for the public. Because most customers are concerned about what will happen to their bills, you should give this table to everyone who wants a copy.

That covers the need-to-know-now issues. Following I give you good-to-know information. But do not get bogged down in reasoning through this material. Adopt new rates, then consider some of these finer points.

Minimum Charges and System Development Fees

To calculate the full cost of the minimum charge, I went through the process of calculating the cost of peak flow capacity and I assigned the smallest meter size (five-eighth inch) peak capacity cost to that minimum charge. Peak capacity shares are shown in Table 11, page 46, and share cost calculations are done in Tables 12, 15 and 16 that follow.

It is my understanding that the Inyokern area is not a hotbed for growth and development. Therefore, system development fees are not an issue, and I did not calculate such fees. If you have such fees, keep them, but I am not recommending you increase them.

Expected Incomes

Table 3, page 38, shows the scant past (estimated) incomes and future incomes to expect, as well as several other things related to revenues. The modeling assumes new rates will be adopted in time to begin assessing fees at those rates on March 1, 2024. That comes up soon, so you would need to move quickly.

Expected Operating Costs

Table 4, page 39, shows little more than the total estimated system expense.

Capital Improvements

Table 5, page 40, shows that capital improvement needs, costs, and revenue sources would have been considered, but there simply are none.

Repair and Replacement Scheduling

Table 6, page 41, shows one item, repair and maintenance of the new well pump. Other items should appear here, but this one item needs to be taken care of to make this well usable.

Target Reserve Levels

Your current reserves are zero. Following is what I normally recommend for systems of your size, with what I also recommend for you in parentheses:

1. Unobligated cash and cash equivalent reserves equal to at least 25 percent of the annual operating costs, not including debt service and general administration costs *(75 percent for you since the system is "broke" and you do not have a separate R&R reserve)*;
2. A 20-year repair and replacement (R&R) schedule reserve, in the 20th year equal to at least three times the average year's cost of R&R *(included in the reserve above)*, and
3. Capital improvement and debt reserves at the end of the tenth year, after debt is paid, equal to that year's debt payments plus cash-paid capital improvement expenses. *(I would recommend the same for you, but you have no debt and no system improvements planned.)*

The lines on the bottom of Table 17, page 50, and several of the charts at the end of Model 2 show the reserve balances to expect for the next ten years. The last line of Table 17, the "Sum of All Reserves," is the critical one. After starting in the "red," reserves will grow to the target level in the tenth year. ***Chart 8, page 56, graphically shows how reserves will perform over the next ten years.***

What if Expenses in the Models Miss the Mark Someday?

First, missing the mark is a certainty. Eventually, the projected expenses will miss the mark. That is why analysis needs to be redone periodically. With time, things change.

If, in a future year it turns out the models failed to accurately predict the expenses you experience, what should you do? That depends upon which way (higher or lower) your expenses went, and how much they differed from what was predicted. It may also depend upon which expense(s) varied because that could markedly affect cost structure, and therefore, rate structure. And it will depend upon what happened to revenues, too.

- Your "fix" for a situation may be to continue with future rate adjustments as recommended. Not all "misses" need to be addressed. Some right themselves.
- Or it may be to speed up or slow down future inflationary increases to get revenues and reserves back on track.
- Or it may be to do a proportional increase to minimum and unit charges based upon the percentage that the experienced expenses are higher or lower than those in Model 2.
- Or it may be to give me a call if you are not clear about how to make the needed adjustments.

My suggestion is this. When in doubt, err on the side of calling me for advice. I can usually talk folks through how to make the appropriate adjustment and I do not charge for that.

If your new situation requires modeling, I probably will request a fee for that. In that case, would estimate the hours needed to do the analysis adjustment and I would propose to do that at the hourly rate I used to calculate the fees for the original project. Most such projects, including the reporting out, take a day or less to do, so they rarely go over $1,000.

If "getting back on track" is a problem several or many years into the future, many issues could then be in play. In that case, it is time for a new rate analysis.

The critical point is this. Do not hesitate to make the recommended rate adjustments just because you are not positive it will work out. Make the adjustments and then track how it works out through the years. If you get concerned about something later, just call. I cannot say, "I have seen it all." But I have seen a lot. I probably can work you through any rate setting situation you will experience.

About the Models, Generally

The models were built to match the system's financial statements and other data as much as possible. Because incomes and expenses in standard financial statements, and other data, are seldom grouped in such a way as to enable the required rate calculation methodology, the models do not always match financial statements.

For modeling purposes, it does not matter whether funds are held in the general system account, a debt service sinking fund, repair and replacement account, etc. Therefore, the models account for funds in a more formulaic way than most utilities do it. When it comes to segregating funds, staff knows best how to do that, so the models do little in this regard and leave the segregating up to staff.

Several line graph charts in the models graphically depict some things which would be difficult to pick out of the tables. In all the charts, the **blue line** represents what would happen under the **modeled** rates and the **red line** under the **current** rates. Financial trends for the red lines are (generally) bad. Those for the blue lines are (generally) good. Review the definitions section of Model 2 to learn the meaning of terms used in the charts.

I will say it simply, like this. Chart 8 depicts reserve levels under the existing rates (red line) and the modeled rates (blue line). When the blue line goes up, that is a good thing for the utility. When the red line goes down, that is a bad thing, at least, if you were to decide to keep your current rates for very long. Reserves should remain stable.

In contrast to Chart 8, Charts 3 and 4 in Model 2 depict user charge rates. When the Chart 3 and 4 blue lines go up, meaning rates are going up, customers do not like that. But the utility will be better funded as a result and that benefits ratepayers because it makes their utility more resilient and able to make improvements that will serve them better. In utility service, getting the service to customers is priority one.

One thing you will notice in viewing Chart 5 is this. Only the red line (current rates) and the black line (goal amounts) show up all the way across the chart. That means the blue line, the proposed rates line, is taking the same path as the line depicting the goal. That is because, in the models, I programmed all funds that exceed what is needed to meet the working capital goal to "spill over" into the CIP and Debt Service fund reserve. Thus, the recommended rates will satisfy the goal, but the current rates are falling short of the goal now and that will worsen with time.

Where do the current rates trend lines come from?

Comparison of the chart trend lines between the current rates (red) and the modeled rates (blue) are useful to planning and action.

My modeling template models incomes, expenses, capital improvement plans and much more, resulting in a set of system development fees and user charge rates that will pay all costs well into the future.

In the background the template also runs a second analysis that assumes the above things but assumes the test year rate and fee structures will continue.

Thus, the results of that "background" analysis can be compared to the "foreground" analysis. That enables an "apples to apples" comparison of what likely will happen under the existing rates with no changes versus what likely will happen under the modeled rates. Often, the best course of action is very easy to see.

As you set and later reset rates, I suggest you follow the guidance I give in my book, "How to Get Great Rates." This book is one of the rate setting resources I mentioned earlier.

Closing

Adopt either set of rates and fees. If future costs, growth, and other assumptions come to pass, you will build prudent reserves and fully fund the utility for several years to come. The Model 2 rates will bill customers fairly for the service they use and be simple to implement. The Model 3 rates will be a bit fairer still, but they are a bit more complicated to implement. The choice is yours.

It is important that you examine incomes, costs, and accrued balances each year to assure the rates are bringing in adequate revenue to meet needs and maintain reserves. If they are not, increase rates across-the-board by a percentage that will bring the balances up to where I calculated they need to be each year.

Conclusion

"Conclusion" is a misnomer here. This report provides information to help the District make decisions. Thus, it begins the process by which you will initially adjust rates and fees and take other actions. I will continue to help you as you do that, so always feel free to call me to discuss any concerns you have as the years pass. Having the models available to track your progress and determine the effect of condition changes later, I should be able to test changes easily and advise you quickly.

As time passes you will need to adjust rates incrementally as modeled in this report and as described in more detail in my book. Eventually, you will start this cycle over.

As you take on the initial adjustments, keep the following in mind.

- Everyone impacted by the District's water rates should at least be made aware of the results of this report.
- My default recommendation is to give any customer as much information as they want. If they want a copy of the full report, give them that.
- Give the media a copy of the full report so they can quote the report directly and accurately rather than be forced to "figure things out." Much of this is very complex. Few people know how to, or have the time to, calculate utility rates. Make it easy for everyone to get the facts right.
- For most customers, what would happen to their bills is as much as they will care to know about this analysis. To satisfy those information needs, the District can publicize the current and modeled rates and/or the bill comparisons.
- A few customers will want to know more, especially high-volume customers. Give them the full report if that is what they want.
- A good way to accomplish these things is to post the report on the District's Web site, Facebook page or other social media, so everyone can see for themselves what the report says. Publicize the posting widely and publicly. Information is a good thing. ***Being seen*** as trying hard to get information out to folks is also a good thing.

At your request and covered in my proposal as an option, I can pay a visit to the Board in person or by video meeting. At that meeting I would discuss my findings and recommendations and answer questions, so all can feel confident this is the right approach to your rate setting needs.

I look forward to helping you adopt adequate rates that are as fairly structured as your conditions will allow.

Appendix A: Rate Analysis Methodology and Related Issues

This appendix covers many issues related to rate analysis and rate setting generally, and specifically to how I do rate analysis. But first, I thank governing bodies for the valuable service they give to us.

The Governing Body's Job is Broad and Critical

The report covered my findings. Based on those findings, I made rate and fee setting recommendations. I may have offered some options, too. However, and this is important, my job is only to advise. The governing body's job is to set rates, among many other things.

Utility management requires the governing body to consider rates-related issues:

- How would the recommended rate structure and overall level of the rates affect ratepayers and funding of system needs?
- How different is the recommended structure compared to the current rate structure, meaning, how much "rate shock" would the recommended rates create for some customers?
- How might the governing body prudently reduce system costs, delay capital improvements, obtain grant or other outside funding for improvements and do many other things to reduce the need for additional revenue?
- And even if rate increases are not a problem, how might the utility be managed differently to reduce costs and be more efficient?

Those are just a few issues related to rate setting the governing body must consider. The job of the governing body is a big one, covering much more than rate setting. The members of the governing body have intimate knowledge of "conditions on the ground," community needs and ratepayer feelings. I only got a glimpse of such things. As the governing body considers those, and many other things, it will decide how to set rates and fees. My analyses and recommendations should be helpful as they do that, but my charge is only to advise, not direct.

All ratepayers and utility customers should be thankful that people from the community stepped forward and joined the governing body to do that critical work. Without such civic-minded people making utility services function well, quite literally, community-based living would not be possible. It is common for some citizens these days to not believe officials and even work against "government" at all levels. That is unfortunate because local government officials make it possible for the rest of us to live and work where we do.

To the governing body members, I say a heartfelt, "thank you." I feel privileged to advise you and I trust you to seek the best overall outcome for your citizens and utility customers.

Now, on to issues that related more narrowly to rate analysis and rate setting.

Rate Setting Resources Beyond This Report

Over the years, I have found that several topics are common to many utilities. Others can be important to a utility at certain times in their development. Rather than cover such issues here, I cover them in separate guides and a rate setting book, all available for FREE download at https://gettinggreatrates.com/Freebies. Following is a listing and descriptions of a few those guides and resources:

1. How to Get Great Rates© (e-book) – The book focuses on basic rate setting issues. It is most applicable to smaller, simpler systems.
2. Rate Setting Best Practices Guide© – This guide expands upon the book to cover affordability, sustainability, bill assistance programs, meter size-based system development fees and minimum charges, how to acquire rate analysis services, and more.
3. Rate Setting Issues Guide© is just that.
4. Replacement Scheduler© is a spreadsheet application that enables users to build their own equipment repair and replacement schedule, which calculates the annuity (savings amount) needed to fund all items in the schedule.
5. CIP Planner© is a similar spreadsheet application for capital improvements planning.

The two spreadsheets were extracted from my rate analysis model template and made a bit more user-friendly for do-it-yourselfers. I encourage my rate analysis clients to use these two sheets so they can make repair and replacement and capital improvement plans more formal, more forward looking and less reactive. Plus, the sheets make data gathering easy for clients and me.

There are other guides and resources on this site. All are FREE, so check them out.

Recommendations for Policy and General Issues

Many of the following things you probably are already aware of or are already doing, but they are worth repeating. A comprehensive list of rate setting best practices is presented in the "Rate Setting Best Practices Guide," cited above.

Whether your entity is a city, town, district, or utility authority, you can use the following as a checklist of "to-do" tasks for rate setting and rate analysis. If a reference you see in the following does not quite fit your situation, consider how you can apply the information to your special situation:

1. It is easy to export data from a robust, user-friendly billing program. Your staff gathered volume usage data from that program for my analysis work. For you to examine payment history and problems, usage trends, new connection trends, the effects of usage allowances and other rate structures on revenue generation, and many other issues, you must have a billing program that is user-friendly and robust. If your current billing

program is not as usable as you would like, I recommend you acquire a program that is. A good first contact to research billing programs is your state rural water association.

2. Retain required funds in interest bearing debt service and debt reserve accounts when required by your lender(s).
3. Have me or another rate analyst of your choosing conduct a full rate analysis again when the ***actual*** financial performance and my ***projection of future*** performance diverge enough to make a new analysis worthwhile. Conditions should dictate rate analysis timing. Most utilities benefit from rate analysis on about a five-year cycle or when total costs have risen by 20 percent. But if you are planning to do significant capital improvements that were not previously included in the rate modeling, or when actual improvement costs or funding plans have changed significantly compared to those that were modeled, those factors call for a new rate analysis as soon as you can get it done.
4. Fully adopt management strategies that are included in what is commonly called, "advanced asset management." These strategies can yield better service and reduced costs for a utility, especially those looking to build new facilities or replace existing facilities soon. At a basic level, you can use my free spreadsheet tools called, "CIP Planner©" and "ReplacementScheduler©" to do capital improvement and equipment repair and replacement scheduling, costing, and annuity calculations. These functions are at the core of asset management and may be all, or nearly all the "asset management" a small, simple system needs to do. Download these tools and others from https://gettinggreatrates.com/Freebies.
5. As a reminder, check with your attorney for language and legality of all issues discussed in this report.

Cost-based Rate Calculations

To give you a synopsis of rate analysis, as I do it, and to make it easier for you to read and understand my findings and recommendations, a tutorial on my methodology is in order. Most situations are simple enough that I do not need to use all these methods, but it will serve you well to know the breadth of my methodology.

When I analyze rates for a government-owned water-based utility, and other utilities that are empowered to assess cost-of-service rates, I use the cost-needs approach. The approach is exhaustively described in the American Water Works Association's "M1 Manual, Principles of Water Rates, Fees and Charges," Seventh Edition. This manual, in use since the 1960s and periodically updated, is considered by many to be the "Bible" of water rate setting best practices.

While the manual focuses on water rate setting and uses terms, units of measure and other things specific to water, the principles and approaches work just as well for electric, sewer, stormwater, trash collection and other utilities and services that are paid for with rates and fees. One just needs to use the appropriate units of measure and a few conventions common to the other types of utilities and services when applying these principles to them.

The cost-needs approach is a static (one year) rate calculation. One could do a new rate study every year to arrive at the rates to assess each year, spread over many years. But that is a lot of work or expense with very little practical benefit to be gained.

Important Terms

The cost-needs approach results in rates that are called, "cost-to-serve" or "cost-of-service" rates. Simply stated, the costs for a targeted budgeting period, usually a year during the next five years, are classified as "fixed," "variable," "capacity-to-serve," or some combination of the three.

- Fixed costs are converted to a base minimum charge.
- Variable costs are converted to a unit charge.
- Capacity costs are converted to some combination of system development fees and surcharges to the base minimum charge.

A typical rate study considers the rates needed to fund one year, usually the coming fiscal year. Utilities need to plan farther into the future than that, so I calculate rates for ten years into the future, hence, the more accurate term of rate "analysis" rather than a rate "study."

Most utilities are better served by getting a rate analysis when rate restructuring may be in order or when rates will need to go up markedly. During the years in between rate analyses, it is simple and convenient to just raise all significant rates and fees by an across-the-board percentage, which should have been specified by the analyst. Such increases may be aimed at keeping up with inflation. Or they may be designed to achieve other goals. In whatever way these increases are to be done, they were planned for in the analysis and described in the foregoing report.

To guide utilities to do future increases well, I expand the cost-needs approach by projecting costs, revenues, rates, and other criteria ten years into the future. That gives each utility a "road map" of what they can expect in the future, so they can reset rates appropriately.

Because I intend for utilities to reset rates on their own for some years into the future, and I want those rates to be "fair enough" to serve them well, I calculate the initially restructured rates so that they take future across-the-board increases into account. This is how it works.

Based on my calculations, the initially adjusted rates will be closer to a "cost-to-serve" structure than the current rates. And as across-the-board increases are applied, rates will move even closer to a cost-to-serve structure until the year used for cost classification has arrived, which normally is four to five years in the future. After that, additional across-the-board increases will move the rate structure further away from cost-to-serve. Eventually, a new rate analysis should be done to make the structure fair again. For most moderate sized utilities, that is about five years into the future. For most smaller utilities, that may be eight or more years away.

To arrive at cost-to-serve rates in a future year, I must choose an appropriate year for cost classification.

- The best year may be the first year after a big capital improvement is planned to be finished because the debt service for that improvement probably will have already started.
- Or, if costs are expected to inflate uniformly, the best year may simply be five years in the future, the year in which most utilities should consider having a new rate analysis done anyway.

There are some basic steps to arrive at cost-to-serve rates. Calling these "steps" implies that I do one and then move on to the next. In practice, most steps are affected by, and affect, what happens in other steps. Therefore, they are all done in concert with the others.

That said, here are the basic steps:

1. Cost Classification: Operating costs are placed into different categories – fixed, variable, peak flow capacity, and sometimes others. I classify costs projected for a year in the future, usually within five years of the present. And I use a year that appears to be typical of what the utility can expect in the future.

   For all utility types, operating cost classification is done in Table 8 of the model(s) that will follow in this report. The core notion of cost-to-serve rates is this: The basic minimum charge assessed to all customers should recover the sum of all fixed costs; and the average unit charge should recover the sum of all variable costs.

   System capacity costs can, and usually should be recovered on a cost basis, too. That is a bit complicated and will be covered shortly.

   Back to recovery of operating costs, near the bottom of Table 8 in the foregoing report, you will see the "Average Fixed Cost/User/Month" and the "Average Variable Cost to Produce/1,000 gallons (or other units)." These are the basic minimum charge and the average unit charge based on the costs expected in that future year. The same model template is used for calculating rates for the various

Rate Analysis, in a Nutshell

At its simplest, rate analysis helps a utility arrive at rates and fees that are adequate – they will pay all the utility's costs. The next level of complexity is to arrive at rates that, on an average cost basis, will enable the utility to recover fixed and variable costs "fairly." Most small water and sewer utilities need analysis only to this level of complexity – doing more than that results in rates that are impractical for small systems.

Another level of complexity includes calculation of meter size-based minimum surcharges and system development (connection) fees. Another includes calculation of rates on a "marginal" cost basis, for special groups of customers. Yet another level is marginal cost basis calculation of rates for individual customers, such as a wholesale customer. These facets of analysis result in accurate but complex rate structures; appropriate for the larger utility with diverse customers.

Analysis can and should provide a sound basis for advising the utility to "go or don't go" concerning various actions it might take. Some of these actions are purely financial. Some, like the decision to enter into, or not enter into, a wholesale supply agreement, for example, include "hassle factor" and other non-financial issues. And because such are agreements are made for nearly forever, a mistake made in the beginning can hamstring a utility for years or decades to come. Regardless of system size, thorough analysis should always be done before entering into such agreements.

utility types. The main difference for those analyses is the measurement method for unit charges.

An aside, but an important one in my mind, is this. The M1 Manual describes how to calculate cost-to-serve rates down to the customer class level. If a rate analyst classifies costs to that level and the utility sets rates that achieve that result, it can correctly be said that the utility has cost-to-serve rates. Those rates will be fairly structured, but only at the customer class level.

I classify costs to the customer level. Thus, rates that I calculate are cost-to-serve to the customer level. My reasoning for doing this is, rate structure fairness if felt at the customer level, not at the customer class level. Customers pay utility bills. Classes do not.

2. Capacity costs: In the ideal, capacity costs should be assessed on a cost-to-be-able-to-serve basis, but these costs are a long-term proposition. No one knows at present what the cost of capacity is because those costs unfold over decades. Thus, the dollar cost of capacity can only be estimated, but that is not a problem. The key is, whatever one estimates capacity will cost, or whatever portion of capacity a utility desires to recover with capacity charges, that cost should be divvied out to new connections and current customers on a fair basis. The following goes to that goal.
    - The American Water Works Association has done excellent research on the sustainable peak flow capacity of different water meter sizes and types, so I generally use the flow capacity of each meter size and type as the basis for divvying water and sewer peak flow capacity costs. That math is lengthy, so it is spread out over Tables 11 through 16 of the model(s) in the report. The notion of capacity applies to all utility services, so:
    - When I calculate water and sewer rates where meters are used, I use meter flow capacity as the capacity share criterion.
    - When I calculate electric rates, I use what is commonly called the "demand" exerted on the wholesale power supplier. If the client produces its own power, I use the demand measured by the client's metering system.
    - When I calculate sanitation (trash collection) rates, I use the cubic foot capacity of the various bin and dumpster sizes times the number of pickups per month of each as the capacity criterion. Thus, for trash collection services except for the rare ones that actually weigh trash as it is collected, the capacity of bins times the pickup frequency becomes a component of the unit charge for each customer.
    - Stormwater capacity is like trash collection in that impervious surface area is the usual capacity, and unit charge criterion. Square footage or the equivalent of impervious surface area appears in the rates as the unit charge analogue.

3. Future cost projections: I project costs ten years into the future. Generally, this is done by applying an expected inflationary factor to each cost. But it is also common that some costs, like the cost of debt service needed to build a new treatment plant in two years, will change future costs markedly. Such cost changes are estimated, then entered into the model in the year in which they are expected to occur. Some expenses, like postage, treatment chemicals and electricity for production, treatment, and distribution, rise with inflation plus growth in the customer base and use. Those are increased in future years by inflation and growth.

4. Reserves: Reserve goals are set through the tenth year. Those goals will only be met if (primarily) rates are set high enough and/or (secondarily) grants and subsidized loans are large enough to enable the utility to generate net revenues over the modeling period. The amount or percentages and types of reserves are dependent upon each utility's needs, so that is discussed in the foregoing report.

For the techie reader, the analysis model we use – a Microsoft Excel spreadsheet application we call, "CBGreatRates" – is usually 3.8 mega-bites in size. Each rate analysis includes one of these sheets.

For a 1,000-connection utility, for example, we use another spreadsheet, 12.1 mega-bites in size, to sort and calculate customer volume use. We use one of these sheets for each rate class. There are usually five or so for the simplest rates. Each of these sheets is linked to the client's usage data file, usually a few mega-bites in size, for importing usage data. Thus, an analysis for a 1,000 connection utility totals 65 or so mega-bites in size.

For some of our larger client utilities with more rate classes and more customers, total size of all the linked spreadsheets runs over 250 mega-bites. We run computers with lots of RAM and memory but some of the calculations for a larger utility can take around 60 minutes to run. When usage data sheet runtimes get long, we usually switch to a database format application to speed up the heavy number crunching.

5. Calculate rates: The full suite of rates needed to fully fund the utility and do it fairly is a dynamic set of calculations, too complex to completely explain here. And each situation requires variations on this theme. I will leave out some details, so this is the "Cliff's Notes" version of rate calculation:

    - Capacity cost recovery is calculated first. Likewise, penalties collected, and other non-user charge fee incomes are calculated. These revenues are deducted from the total revenue needed to arrive at the revenues needed from user charge fees.

    - Next, the across-the-board future rate increase rate (a percentage) is set. In the future, starting about one year after the initial rate adjustments have been done, rates will increase annually by this percentage. The revenue needed from the initial rate adjustments, here called the "net revenue need," will come from the revenues generated by the initial rate adjustments. (In truth, future inflationary revenue increases, plus interest earnings on balances accrued are dependent upon the rates that are initially set, so most "pre-calculated" revenue streams are adjusted dynamically as initial rate revenues rise or fall.)

- The calculated bases for fixed costs and variable costs (Table 8) establish a ratio of the revenues that each rate component would generate in a cost-to-serve structure.
- To increase (or very rarely decrease) overall revenues to satisfy the net revenue need, each revenue stream is increased or decreased by the same percentage. Thus, the revenue streams remain in the same ratio to each other. That means they retain their cost-to-serve proportions.
- Once the overall revenue increase (or decrease) is established:
  - The base minimum charge is "back calculated" from the adjusted minimum charge revenue amount. (Every customer, regardless of their meter size, pays the base minimum charge.) The meter size-based surcharge, for water and sewer systems, is added to the base minimum charge to arrive at the full minimum charge for each meter size. (Similar math is done for other utility types.)
  - The average unit charge is calculated from the unit charge revenue amount. If inclining or declining rates are to be assessed, or if there is to be a usage allowance, unit charge revenues are calculated dynamically based on those variations.
  - The resulting rates are the starting user charge rates – the initial adjusted rates – what you will (hopefully) adopt initially. In later years, you will increase these starter rates and fees across-the-board by the inflationary factor, generally to keep them tracking with rising costs.
- After examining balances projected for future years, the future inflationary increase rate may be raised or lowered to enable the utility to accrue appropriate balances either sooner or later. That, of course, will result in initial rate adjustments that would need to be either lower or higher, respectively, to offset the change to the future adjustments rate.
- Finally, it is common for managers and decision-makers of utilities to want to "tweak" rates into a different structure, timing of adjustment or in other ways. Having built the model to handle "on-the-fly" adjustments, I model their preferences to arrive at the rates needed to fund the utility as they desire.

6. Reporting out: The culmination of all this data gathering, calculations and more ends up in a rate analysis report like the report this appendix is attached to. The report covers everything that seems to be important and gives the client my recommendations and guidance on how to adjust rates now, and in the future.

If desired by the client, I present the report, my findings and recommendations, and answer questions, usually at a Board or Board meeting. Before COVID-19 that was always done in person or rarely by phone call into their Board or Board meeting. During COVID-19, that was almost always done by remote video. After COVID-19, these meetings are being done either way, as the client desires. Many of my client systems are small and their management had not yet adopted on-line meetings. COVID has changed that. Many of my "meetings" now are done on-line, even with very small utilities. Cutting out my travel saves them a lot.

Cost-to-serve rates are considered by many, including me, to be the most mathematically fair and defensible rate structure. While I previously described how I do such calculations, I will now tell you what I consider to be "fixed" costs, "variable" costs and "capacity-to-serve" costs:

- ***Fixed operating costs are those that are related to the fact that you have customers.*** For every customer, the utility incurs one increment of this type of cost. Billing is the simplest, purest example of a fixed cost. Whether a customer uses a lot of the commodity or none, it (almost always) takes the same work, equipment, software and more to calculate their bill, "send it out" and collect the money.
    - Another part of the minimum charge will likely be a surcharge intended to recover all or part of peak flow or unusual capacity costs. These are almost always based upon water meter size because the larger a meter is, the greater is its capacity to sustainably pass peak flows. This peak flow capacity relates well to the cost of building infrastructure "big enough" to handle peak flows. Thus, ***capacity costs are related to the fact that a particular customer has a certain capacity to demand flow or service, regardless of how much flow or service they actually use.*** These surcharges are added to the base minimum charge to arrive at the full minimum charge for each meter size.
    - Larger systems invariably have more large meter customers and that makes surcharging the larger meters worthwhile and fair.
    - However, small systems with few "unusual" customers and few meters larger than one inch often find it expedient to consider even peak flow capacity cost to be a fixed cost, equally sharable by all customers. At some point, there is more to be gained from administration simplicity than exact rate structure fairness.
- ***Unit charges are related to the volume of service received.*** While unit charges can be structured in various ways, the revenues they generate should be adequate to pay those costs that are related to the flow that customers use.

There are three unit charge structures that I commonly recommend, depending on the situation:

- Some systems need "conservation rates," or, their administrations simply like the notion of encouraging customers to use less of the utility's services. In this rate structure, the unit charge goes up as volume used goes up. Most of us respond to, or at least we think twice about it, when we are assessed a higher price to buy more of something. Conservation rates are most appropriate in areas with limited water supplies or in a utility that is bumping up against its capacity to produce water.

If you are going to err either on the side of complex rates that precisely assess costs to each customer or simpler rates that round off some of the accuracy corners but are easier to administer, choose simple rates.

- Most systems use, and should use, level unit charges – a unit charge that is the same regardless of how much volume a customer uses. With level unit charges, customers are assessed unit charges on an average unit cost basis. Such rates are the easiest to calculate, they are the easiest for a clerk to explain to a complaining customer on the phone and the revenues such rates will produce next year are the easiest to accurately predict. Most water utilities, and almost all sewer utilities assess level unit charges.
- The last major unit charge structure is called, "declining" rates. These are the reverse of conservation rates. I often call them, "use encouragement" rates. It is popular these days for many to belittle those who do not conserve resources at every opportunity. Declining rates are often scorned for that reason. However, if a system has an ample water supply and ample infrastructure to produce and distribute it, doing so will not cause unintended bad (mostly environmental) consequences; and if the governing body wants to encourage high use (which often entails such users hiring more or better paid workers), declining rates can make good sense. Declining rates are most appropriate in areas that have many high-volume industrial users or folks in that area want to attract such users. Declining rates seem to be most common in the industrial east, but they seem to be less popular everywhere these days. However, keep this in mind. One can accurately calculate the average unit charge and "prove up" that rate case. One cannot do the same with inclining or declining rates.

To complicate the aforesaid just a bit, rate setting is first about recovering costs. Job one of utility rates is to pay the utility's costs. But usually, proper rate setting is also about building adequate reserves; funding a capital improvements program (CIP); catching up on needed equipment repair and replacement (R&R); and covering similar needs. Thus, these soon-to-be-experienced costs or likely-to-be-experienced costs need to be factored into rates and fees, as well. Because time marches on and costs usually inflate over time, rate setting should account for the need for future incremental increases to cover inflation. And you cannot just assume that because the utility needs more revenue that your ratepayers will be glad to pay higher rates. Rate affordability, and the public's perception of affordability, must be addressed, too.

Even the simplest rates situation requires some complex and integrated calculations to account for these factors. For that reason, I build a spreadsheet for each analysis that depicts, in virtual reality, the utility's real-life financial and rates situation.

These models are dynamic. When the initial rate increase is set higher, future inflationary increases can be lower. When minimum charges are set lower, unit or other charges need to be set higher to make up the shortfall. When future expenses need to be higher, or lower, or of a different nature, Model 2 adjusts rates and fees accordingly. Such modeling enables me to do dynamic "what-if" scenario calculations. That enables me to arrive quickly at the "best fit" rates for each utility. Usually but not always, the client goes with what I recommended.

Coincidentally, such a dynamic model makes it easy to calculate rate and other changes over the next two or three years, too. If a change does not affect the cost structure drastically, I can do the same for almost any cost or rate change. If one, two or three years from now, you discover your costs or incomes will be different from what you and I had assumed, you can call me up, tell me what is different, I will enter the changes into the model(s) and re-run the rates. If the change is small and quick to model, I do that for no charge. If it is more complex and will take some time and usually a written report, I do those projects on an hourly basis. Fees for those usually come in at $500 – $1,000. Some clients find that to be a very accurate and cost-effective way to maintain good rates.

Truth be told, I have been building my template model since 2005. It is the starting place for all my analyses. The template is so robust that I can set a few "switches" here and there, build in a few things that are unique to a new client's situation and soon, I am modeling rates tailored to their needs.

Temptation Happens

I could build a static model that arrived at what I thought was the best rates outcome for a client. If the client asked for something different, I would be tempted to tell the client that, "In my experience, blah blah, blah, that would not be a good thing to do." Based on my experience, I probably would be right, but that tack would be self-serving – it would save me work.

- Half the reason I build dynamic models is to be able to show the client the outcome of what they asked for and that usually proves up the case for what I originally recommended.
- The other half reason is, when I model what the client asked for, I sometimes find that indeed, it is doable and may even be superior to the solution I assumed was best.

Assumptions based upon deep experience are useful. But facts and good math are a great training experience for a rate analyst.

Two final thoughts on the rate modeling and adjustment topic:

- Almost always, rate adjustments include bill increases. Thus, time is money, often big money, to the utility. A rate increase delayed is a rate increase that must be even higher to reach the same reserve target. Get to know this report well but do not spend months mulling it over. Time will not make your rate setting task easier. Proceed deliberately but quickly and make the needed changes. If you cannot make all the needed changes at the same time, make those that you can as soon as you can. Then, get around to the rest as soon as you can.

- You will get complaints about customers' bills going up. I do not want to be dismissive, but in my experience, most of the time, when the math is laid out for all to see, most people are understanding. Cost-to-serve rate analysis does not arrive at unfair rates. It arrives at fair rates. Who doesn't want fair rates? Well, those who are paying cheaper than fair rates. If they can convince those who are subsidizing them to keep subsidizing them, even those the analysis shows that is not fair, more power to them. But generally, cost-to-serve rates win the day.
    - These statements do not mean "do-it-yourself" rate adjustments are always unfair or insufficient, or that "rate analyst" calculated rate adjustments always are fair and sufficient. I always try to calculate and advocate for rates that are fairly structured. But over time, costs and other conditions change, so even cost-to-serve rates I have calculated will become unfair after some years.
        - A good blend of fair rates and a low cost to achieve them is this. You get a rate analysis done occasionally and adjust accordingly. For a few years after that, do-it-yourself across-the-board increases will keep revenues tracking with inflation. Eventually, you analyze again.

Please keep the above summary of cost-based rate calculations in mind as you read on.

Principles

I use several guiding principles when I help systems set their utility rates, fees, and policies. I considered these principles as I prepared the foregoing rate analysis report and the model(s) that follow:

1. Water, sewer, and all other utilities are businesses, regardless of who owns them. The first order of business is, stay in business. Your customers want you to do that. They do not want their investments in homes and businesses to be left high and dry without utility services to support them.
2. The second order of business is, perform in a business-like manner. First, be effective. If you do nothing else, be effective. Next, be as efficient as is reasonably possible. Efficiency tends to foster lower rates, which ratepayers like. Effectiveness and efficiency fight against each other. In most utility services and situations, effectiveness trumps efficiency. It does not benefit water customers if you pump lots of water cheaply if that water will make them sick, or if too much of it leaks out of holes in the pipe. Customers also gain more benefit from water rates that are a bit higher than they would like, but those extra funds enable the utility to be sustainable.
3. If a service costs the utility money, the utility should recover that cost from the most logical "person" if that makes good business and community administration sense. For example, generally "growth should pay for growth." Developers should fairly pay for their consumption of utility capacity obligated to what they build by paying commensurate system development fees. Likewise, service users should pay for what

they use. Each class of users should pay their fair share of service costs. Ideally, each individual user should do that, too.

> As you consider rate adjustments, always keep this customer in mind:
>
> The "little old lady, widowed, retired, living alone on Social Security." Treat her badly, or just be seen as treating her badly, and you lose the goodwill contest. Lose goodwill and you may never get it back.

4. It sometimes contradicts point number 3 above, but if adjusting a rate, fee or policy will turn currently "good" customers into "bad" customers, or discourage development that the community desires, you should consider the necessity of making the change carefully before doing it. For example, while it may be warranted, raising the minimum charge markedly to your residential customers may make it very difficult for fixed, low-income customers to pay their utility bill. That may cause more of them to pay late or not pay at all. That may trigger the utility's attorney to write collection letters to those customers and eventually require shutoff of service. Thus, in the attempt to generate more net revenue by raising rates, net revenues may go down due to non-payment and payment collection costs. Likewise, stifling development with uncompetitive system development fees costs a utility in the form of additional paying customers that choose to "build down the road." That forces existing customers to pay all the costs of the utility rather than sharing them with new customers.
5. While cost-based rates are the most demonstrably fair rate structure, purely cost-to-serve rates can be impractical for some utilities. Consider this:
    a. A large city has thousands of customers served by a wide range of meter sizes and those customers have a wide range of service use. That city needs rates that are cost-based and, necessarily, those rates will be complicated. Such rate complexity is worthwhile because the utility's situation is complicated.
    b. In contrast, a small town serves few customer. Those customers usually have only a few meter sizes and few of them use high volumes of service. That town would not be well-served by complicated rates. Simpler rates are better for them.

However, both should still get a cost-to-serve rate analysis at least occasionally, so even if they adopt something else, they will know what you are giving up.

That is probably more than you care to know about rate analysis but if I did not answer all your questions, just give me a call, or drop me an e-mail.

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This is an emergency rate increase situation for the District. While the included rates have been calculated using my normal methodologies, the critical thing for the District is to adopt new rates as soon as possible.

January 9, 2024

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Note: This document is a print out of the spreadsheet model used to calculate new user charge and other rates and fees for the next 10 years. These calculations are complex and are based upon many conditions and assumptions. These issues, and others, are described in a narrative report that accompanies this model.

Definitions

Affordability Index	The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. Affordability index is often a factor in determining grant and loan eligibility and grant amount.
Analysis Year	The year following the "test year." Generally, rate analysis is done during the year following the "test year" and intial rate adjustments are done later still during the analysis year or sometime during the following year once the analysis shows how rates should be adjusted. See related "test year."
Capacity Cost (also see System Development Charge)	The cost incurred to design and build the infrastructure needed to provide a utility service. As the infrastructure ages and wears out from use, it must be refurbished and replaced, which is a continual capacity cost. Capacity costs are recovered in various ways - connection fees, system development fees, regular user charges and others. The cost of that capacity and the nature of the costs - base flow capacity versus peak flow capacity - should determine the way these costs are recovered.
Capital Improvement Plan or Program (CIP)	A schedule of anticipated capital improvements. These are the more expensive items such as treatment plants, lines and other expensive infrastructure that generally requires bond or grant funding.
Capital Improvement Reserves	Cash reserves dedicated to funding the CIP
Comprehensive Rate Analysis	A thorough examination of a system's operating, capital improvement, equipment replacement and other costs, revenues, current rates, number of users and their use of the system, growth rates and all other key issues surrounding the system. This examination will determine how rates and fees should be set in the future to cash-flow the system properly, to build appropriate reserves and to be fair to ratepayers. It also will determine how policies should be adjusted to enable the system to operate well now, operate well in the medium-range future (about 10 years) and prepare for expected and expectable events such as capital improvements and equipment replacement.
Connection Charge	See system development fee
Conservation (Inclining) Rates	Unit charges that go up as the volume used goes up
Cost-to-produce	There are several ways to define and calculate cost-to-produce. Each is acceptable for different purposes. Generally, cost-to-produce is the total of all variable costs required to get service to a utility's customers during one year divided by the total units of service delivered during that year. This calculation will yield the average cost-to-produce. In a proportional to use rate structure, this is the unit charge. See "Cost Calculations" at the bottom of Table 19.
Cost-to-serve, or Cost-of-service Rates	Rates where, at the customer class level, fixed and variable costs caused by each customer class are paid by that class primarily with minimum and unit charges, respectively. However, this analysis model takes it one step further and calculates cost-to-serve rates at the individual customer level.
Cost Types; Fixed and Variable	The two main types of costs are fixed - those that are related to the fact that someone is a customer; and variable - those that are related to the volume of the commodity delivered to customers. Generally, fixed costs should be recovered with minimum charges and variable costs with unit charges.
Coverage Ratio (CR)	Incomes available to pay debt divided by the amount of the debt for that year. A CR of 1.0 is "break-even." Most systems should have a CR greater than 1.25.
Current Position	For purposes of this report, for one year, the sum of all incomes and undedicated reserves minus all current financial obligations for that year. Future obligations (next year's loan payments) and depreciation are not included. Current position, often called "cash and cash equivalents," is a good measure of liquidity.
Declining Rates	Rates where unit charges go down as the volume used goes up
Fire Sprinkler Systems and Related Costs	Generally, fire suppression in businesses is provided by a built-in system of fire sprinklers. "Service" to such systems is primarily in the form of peak flow capacity availability to fight a fire. Capacity costs money, so larger, more sophisticated water systems should assess at least part of such costs to fire suppression systems. Small water systems usually do not charge separately for these costs, and that is reasonable.
Fixed Cost	Accounting considers a cost that does not change to be a fixed cost. That definition does not work fairly for rate setting purposes. For rate setting, a fixed cost is one that is related to the fact that you have customers. The simplest example is billing, because the utility incurs billing costs not in relation to the volume of service a customer consumes. Rather, those costs are equal for all customers, or they are so close to being equal for all customers that one likely could not justify such a cost being different for one customer compared to other customers.

Definitions

Flat Rates	Rates where all users pay exactly the same fee regardless of the volume of service they use
Equivalent Dwelling Unit (EDU) or Equivalent Residential Unit (ERU)	This definition is for water and sewer service. Based upon number of water using fixtures, average flow, potential flow or similar criteria; the consumption rate of the average single family home is rated at one ERU. All other types of customers are then compared on this basis and multiples or parts of an ERU are assigned to each for billing purposes.
Equivalent Residential Unit (ERU) for Stormwater	This definition is for stormwater. As compared to water and sewer, that are concerned with water flow, one ERU of stormwater service is the average square footage of impervious surface of a single family home. Then, larger and non-residential properties are rated by their multiples or parts of an ERU of impervious surface area for the purpose of billing for stormwater impact costs. When there is a large variation in single family home size and impervious surface area, some cities and similar places use the smaller size range of homes as their ERU standard and assess larger homes at multiples of that ERU basis, as well.
Incremental Rate Increases (Inflationary Increases)	Rate increases done, generally annually, following the initial rate adjustment. The usual goal of such increases is to keep the system's incomes on track with inflation. Such increases are usually small, in the two to five percent per year range.
Initial Rate Adjustments	Rate adjustments done in response to the comprehensive rate analysis. Generally, the goal of such adjustments is to establish rates that cover the system's short-term expected costs and do it with a structure that is fair to ratepayers. Initial adjustments should be followed in subsequent years with incremental rate increases.
Inflow & Infiltration (I&I)	In a sewer system, water that gets into the collection system by way of illicit connections (inflow) such as gutter downspouts, plus leaks in manholes and sewer lines (infiltration)
Infrastructure	Most commonly thought of as the hard assets, such as buildings, treatment plants and lines needed to provide service to customers connected to the system. In reality, staff, software and other "soft" assets should be thought of as infrastructure, as well because the hard assets cannot run well or run for long without staff.
Life-cycle Cost	The total cost to design, build, operate, maintain and eventually dispose of, or decommission, an asset. One asset may cost less to build but it may be more expensive to operate and maintain, yielding a higher total life-cycle cost. Life-cycle cost is an important consideration of asset management.
Marginal Costs	The parts of a utility's costs that are unavoidable in the course of serving a particular customer, a group of customers, more volume to all customers or some other marginal use of the system. Such customer(s) or extra use could be added at a discounted but still profitable fee, if desired. Generally marginal costs are less than the average costs but when extra use requires a system upsizing, they can be greater. These costs are especially useful when considering selling service at wholesale or charging "snow birds" while they are away, for example.
Minimum Charge	This rate, charge or fee goes by other names. "Base charge" and "availability charge" are common. This is the periodic fee paid for having water, sewer or other commodity service made available to the customer to use. Most common is a monthly or quarterly minimum charge. Generally, this charge should recover fixed costs.
Mixed Costs	Fixed and variable costs are defined elsewhere. Costs that are mixed are those that are a blend of fixed and variable. For example, a utility hires staff and provides them benefits partly just to have staff on hand to deal with line breaks, equipment breakdowns and other problems. But most staff time and related costs are incurred because the utility is doing what it was designed to do - provide water or other commodity services to customers. Two gross examples illustrate the extremes of staff costs. In one small water system with one operator, the operator sits around in the shop all day, every day with nothing to do. The cost of that operator is fixed and should be shared by all customers equally in a minimum charge. Another water system has one operator, but that operator works all day, every day operating and maintaining the system. That operator is enabling the system to do what it was designed to do - provide a commodity - so that operator's time and related costs should be considered variable and recoverable through unit charges. In reality, staffing and many other costs are a blend of fixed and variable costs, so they should be consider partly a fixed cost and partly a variable cost.
Operating Costs	Definitions and calculations vary. For rate setting purposes operating costs are costs incurred because a system is operated. Such costs are usually recovered primarily through unit charges.
Operating Reserves or Working Capital	Analogous to current position, this is the net revenues generated during "profitable" years and retained to fund operating costs during times when costs exceed incomes.
Operating Revenues	Revenues collected in the form of user fees and similar operating cost-related fees
Operating Ratio (OR)	Current incomes divided by current expenses, not including debt. An OR of 1.0 is "break even." Most systems should have an OR of 1.25 or higher.
Payback Period	In this case, time required for the investment made to get this analysis done to return that investment through increased user and other fees.

Definitions

Peak Flow Capacity or Demand	The volume of service that a user could demand for a short period of time at full volume use. In water systems, and generally in sewer systems, too, the peak flow capacity limiting factor is usually the size of the customer's meter or service line. In electric systems, demand for each commercial and industrial customer (and sometimes others) is usually calculated annually based upon the peak energy usage during a defined short period.
Proportional to Use Rates	Rates where the minimum charge recovers all fixed costs, the unit charge recovers all variable costs, the unit charge is the same for all volume sold, and there is no usage allowance in the minimum charge. This rate structure is similar to and often the same as cost-to-serve rates.
Replacement Schedule	A timetable that describes equipment replacement and important repairs that are too infrequent and/or too expensive to cover as annual operating costs but not so expensive that they need to be covered as capital improvements.
Replacement Reserves	Cash reserves used to fund the Replacement Schedule
Return on Investment	In this case, the dollar amount or percentage of revenue gain enabled by this rate analysis. Related to payback period.
Snow Bird	A customer, usually residential, that goes away during part of the year. Most commonly, these are people of "means" who live in the north who "fly south" for the winter. But, this category includes everyone who is absent for a significant part of the year but returns to their permanent residence.
Stormwater	Precipitation that falls on and then leaves a site, flows elsewhere, potentially causing or adding to flooding and often carries with it sediment and pollutants.
Stormwater Management	The practice of reducing and mitigating off-site stormwater flows and impacts.
System Development Charge, or Fee	Fee assessed to pay for at least part of the cost to build system capacity. For purposes of this model, all charges related to connecting new customers will be "rolled together" into a system development charge, usually including a charge that buys a new customer system capacity. This combined charge may be a few hundred dollars for a residential customer, if little or no capacity costs are included. If capacity costs are included, it could be many thousands of dollars for a large industrial customer. Similar terms in common use include "tap-on fee," "connection fee or charge," "hook-up fee," "impact fee," "availability charge," and "capacity charge."
Test Year	The one year period from which data was gathered to be the basis of the rate analysis, the starting place, which is usually the last completed fiscal year. See related "analysis year."
Unit Charge	This rate, charge or fee goes by other names, too. It is the rate paid for water, sewer or other commodity per unit of measurement, like per 1,000 gallons or per 100 cubic feet. Generally, this charge should recover variable costs.
Usage Allowance	The volume, if any, that is "given away" with the minimum charge. Most systems give away no volume. Those that give away an unlimited volume have what are called "flat rates" - a minimum charge only.
User Fee, User Charge, User Rates	Fees assessed to customers for use of the system. This does not include system development charges, late payment penalties or other types of charges.
Variable Cost	Accounting and rate setting agree on this definition. For rate setting, a variable cost is one that rises and falls as the customer uses the commodity. The simplest example is electricity used to treat and move water around. While the power company assesses a minimum charge and demand charges to the water or other utility that is "signed up" for electric service, the majority of the electric bill rises and falls with the volume of water produced by that utility. Therefore, variable costs should be recovered with unit charges.
Water Loss and Unbilled-for Water	Measured by volume or percent, the part of a water system's net water production that does not reach customers or is not billed to customers. This loss also includes billable volume lost due to under-registering customer meters. "Unbilled-for water" includes water loss, but it also includes water actually given away at no charge.
Working Capital, Net Income	The amount left in the operating fund after paying all costs due during that month, year or other time period.
Working Capital Goal or Operating Reserves Goal	The desired operating fund reserve, in dollars or percent, at a stated point in time. Small systems (1,000 connections) generally should target 35 percent or greater. Larger systems can target a lower percentage. The goal for each system should be based upon the needs of that system and the risk the customers are willing to take.

Table and Chart Descriptions

The tables and charts of this model tell a story about the rates and finances of the utility.

The tables you first see in this model depict utility data, like the rates that were being assessed to customers during the test year, the volume of service those customers used, how much income the utility collected, what its costs were, and more. This data came from utility records. In addition, the tables in this model go beyond the utility's historical data and include projections of incomes that will be generated by the new rates, future expenses as they grow with inflation and other forward-looking features.

Tables in the middle part of the model primarily calculate new rates and fees that will generate enough revenue to pay the utility's costs over time.

The tables in the last part of the model show the results of new rates and fees. Those include the rates themselves, surcharges to rates, if appropriate, the affordability of the new rates, and reserves generated by the new rates. Many of these results as shown graphically in charts at the end of the model.

As you progress through the model, keep this story in mind. You probably understand much the math performed by the model. There is some you likely do not recognize, and that is OK. Just know that new, adequate rates were calculated based upon the utility's historical data, projected into the future.

A final note: When a numbered table or chart listed below is not in the package, that was not a mistake. It simply means that table or chart from our master program was not needed in this situation, so it was bypassed and left out.

Now, here are descriptions of the tables and charts.

Name	What Each is or Does
Definitions (List)	The meaning of terms used in this report and in rate setting generally
Return on Investment (Calculation)	A summary of financial outcomes enabled by the proposed rates
Table 1 - Rates	User rates in effect at the end of the test year. Unless rates were recently changed, these are the current rates.
Table 2 - Test Year Usage	Compilation of actual volume of service used by customers during the test year
Table 3 - Basic User Data and Operating Incomes	Basic user statistics and operating revenues, projected for 10 years, based on the assumption the modeled rates and future inflationary increases will ber adopted
Table 4 - Operating Costs and Net Income	Operating costs projected for 10 years
Table 5 - Capital Improvements Program (CIP)	Capital improvements and how they will be paid over next 10 years, including debt service
Table 6 - Equipment Replacement Schedule - Detailed	If applicable, detailed schedule of equipment replacements for next 20 years
Table 7 - Equipment Replacement Annuity Calculation	If applicable, calculation of the annual annuity (yearly savings amount) needed to pay for all equipment replacements as they come due and ending with the desired balance
Table 8 - Average Cost Classification	Sumation of a target year's costs and calculation of the "cost-of-service" rate structure basis for recovery of fixed costs and variable costs. Unless directed to do otherwise, this analysis developed cost-to-serve rates based on cost classification in this table.
Table 9 - Marginal Cost Classification	If applicable, calculation of costs incurred to serve a specified type of customer
Table 10 - Initial Rate Adjustments and Resulting Revenues	These are the modeled user rates and the resulting "blended" revenues they, and the current rates, will generate during the rate adjustment year
Table 11 - AWWA Safe Operating Flow by Meter Size	If applicable, this table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers.
Table 11B - Fire Sprinkler Peak Flow Capacity Factor	If applicable, this table shows peak flow capacity shares of various size fire sprinkler systems.

Table 12 - Flow Capacity Costs	If applicable, calculation of the various costs to build base and peak flow capacity to serve customers, when such fees will be based on water meter size
Table 12B - Capacity Costs Attributable to Fire Sprinkler Systems	If applicable, nearly the same as Table 12, except it applies to fire suppression systems.
Table 13 - System Development Fees	If applicable, calculation of meter size-based system development fees needed to recover costs calculated in Table 11, when such fees will be based on water meter size.
Table 13B - System Development Fees for Fire Sprinkler Systems	If applicable, nearly the same as Table 13, except it applies to fire suppression systems
Table 14 - Revenues From System Development Fees	If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 13.
Table 14B - Revenues From System Development Fees for Fire Sprinkler Systems	If applicable, nearly the same as Table 14, except it applies to fire suppression systems
Table 15 - Minimum Charge Fees, Including Capacity Surcharges	If applicable, calculation of meter size-based capacity surcharges and minimum charges to recover costs calculated in Table 11, when such fees will be based on water meter size
Table 15B - Sprinkler System Capacity Charges	Nearly the same as Table 15, except it applies to fire suppression systems.
Table 16 - Revenues From Minimum Charge Surcharges	If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 15.
Table 16B - Revenues From Sprinkler System Charges	Nearly the same as Table 16, except it applies to fire suppression systems
Table 17 - Financial Capacity Indicators and Reserves	Shows the financial effects of the modeled rates, costs, etc. on the utility and on the benchmark 5,000 gallon per month residential water or sewer customer, as appropriate
Table 18 - Bills Before and After Rate Adjustments	Bills at the modeled rates are compared to those under the current rates. Note: the modeled bills do not include capacity surcharges to the minimum charges unless they are included in the minimum charges column of Table 10.
Table 19 - User Statistics	If included, this table shows volumes and percentages of use, revenue generated and other statistics
Chart 1 - Operating Ratio	*Graph of operating ratio for 10 years as a result of the modeled rates and the current rates*
Chart 2 - Coverage Ratio	*Graph of coverage ratios for 10 years of the modeled rates and the current rates*
Chart 3 - 5,000 Gallon Residential User's Bill	*Graph of the bill for the benchmark 5,000 gallon per month residential user, with smallest available meter size (used in grant and loan eligibility determinations) as a result of the modeled rates, and the current rates*
Chart 4 - Affordability Index	*Graph of the affordability index for 10 years of the benchmark residential user's bill (used in grant and loan eligibility determinations)*
Chart 5 - Working Capital vs Goal	*Graph for 10 years of total (unobligated) cash assets at modeled rates compared to the goal for total cash assets*
Chart 6 - Value of Cash Assets Before Inflation	*Graph for 10 years of unobligated cash assets NOT adjusted for inflation at modeled rates and current rates*
Chart 7 - Value of Cash Assets After Inflation	*Graph for 10 years of unobligated cash assets adjusted for inflation at modeled rates and current rates. This is the real buying power of cash reserves.*
Chart 8 - Sum of All Reserves	*Graph of all reserves of all kinds at the modeled rates and at the current rates*

Return on Investment

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

The rates depicted in this model will produce various returns on investment or paybacks. Usually the most important payback, at least to ratepayers, is a rate structure that is demonstrably fair. For the system, however, making sure that revenue will be adequate to pay all expected, expectable and many unexpectable costs is the the most important return. If revenue will increase as a result of this analysis, which is almost always the case, one can calculate a dollar and percentage return on investment.

The following calculations show what was invested and what the returns will be over two periods; five years and 10 years. Five years is a reasonable period for return projections for rate analysis because that is about as long a a good rate analysis can project accurately. Ten years is a good basic planning horizon but you should not bank on amounts or returns projected that far out. Besides, most systems should have their analyses redone long before then.

Consider these key points about return on investment. Higher rates will fund more improvements, better repair and replacement and more. Most increases in revenue end up being used for such expenses. Thus, few systems end up with a dramatic increase in their cash reserves but they do markedly improve their financial position. In addition, fairer and higher rates generally enable systems to qualify for grant and loan funding that they otherwise would not. That increases the importation of "other people's money," which is a drain on the state and federal funds, where the money comes from, but it is very desirable at the utility level. The calculation below ignores any "outside" funds the utility may capture.

Also note that rates in this model have been modeled to be adjusted during the year following the test year or even later. That year is included in the first five-year return on investment calculation. Thus, the first year of returns calculated below include most or all of one year where rates will not have been changed yet. Thus, the real rate of return will be greater than the calculation reflects.

Calculations

$8,863	Fees to GettingGreatRates.com
$500	Estimated value of system staff time and incidentals to assemble needed information
$9,363	Total Investment for This Analysis
$771,163	Five-year Increase in Revenue Due at Least Partly to This Analysis
8,236%	Five-year Return on Investment (increase in revenues / investment)
$1,960,189	Ten-year Improvement in Cash Position Due at Least Partly to This Analysis
20,935%	Ten-year Return on Investment (increase in revenues / investment)

Table 1 - Rates
Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

If we received the now current rates for the utility, the current rates are in this table. Otherwise, these rates were in effect at the end of the test year. If a volume range was left out of the table, rest assured, it is in the Model. We just hid some volume ranges to make the table and report shorter. In such cases, the unit charge that applies to next lowest volume range also applies to the hidden volume ranges.

Test Year Ending and (Assumed) Current Rates

Customer Type, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Use Within Each Range in 100 Cu Ft	Billing Cycle Minimum Charge	Usage Allowance in 100s	Unit Charge per 100 Cu Ft
All Metered Customers	0	133	1.337	$27.47	0.000	$1.75
	134	266	1.337	$27.47	0.000	$1.75
	267	400	1.337	$27.47	0.000	$1.75
	401	534	1.337	$27.47	0.000	$1.75
	535	667	1.337	$27.47	0.000	$1.75
	668	801	1.337	$27.47	0.000	$1.75
	802	935	1.337	$27.47	0.000	$1.75
	936	1,069	1.337	$27.47	0.000	$1.75
	1,070	1,202	1.337	$27.47	0.000	$1.75
	1,203	1,398	1.963	$27.47	0.000	$1.75
	1,399	1,398	0.000	$27.47	0.000	$1.75
	1,399	1,599	0.000	$27.47	0.000	$1.75
	1,600	2,599	0.000	$27.47	0.000	$1.82
	2,600	3,599	0.000	$27.47	0.000	$1.86
	3,600	4,599	0.000	$27.47	0.000	$1.89
	4,600	5,599	0.000	$27.47	0.000	$1.93
	5,600	5,733	0.000	$27.47	0.000	$1.96
	6,937	6,938	0.000	$27.47	0.000	$1.96
Bulk Water	0	133	0.000	$0.00	0.000	$7.46
	6,937	6,938	0.000	$0.00	0.000	$7.46

Table 2 - Test Year Usage
Inyokern Community Services District, Inyokern, California, Water Rates
Model 2023-2

This table shows usage by all customers during the test year.

Test year = the one-year period being analyzed starts: 1/1/2022

Date this model created: 11/30/2023

Residential meter readings per year: 12

Other customer readings per year: 12

Bills per year: 12

Customer, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Use in Each Range in Cu Ft	# of Customers That "Maxed Out" in Each Range	% of Customers That "Maxed Out" in Each Range	% of Total Use in Each Range
All Metered Customers	0	133	382,353	0	0.0%	0.0%
	134	266	382,353	0	0.0%	0.0%
	267	400	382,353	0	0.0%	0.0%
	401	534	382,353	0	0.0%	0.0%
	535	667	382,353	0	0.0%	0.0%
	668	801	382,353	0	0.0%	0.0%
	802	935	382,353	0	0.0%	0.0%
	936	1,069	382,353	0	0.0%	0.0%
	1,070	1,202	382,353	0	0.0%	0.0%
	1,203	1,398	561,275	0	0.0%	0.0%
	1,399	1,398	0	238	100.0%	100.0%
	1,399	1,599	0	0	0.0%	0.0%
			4,002,452	238	100.0%	100.0%
Bulk Water	0	133	0	0	0.0%	0.0%
	6,937	6,938	0	0	0.0%	0.0%
			0	0	0.0%	0.0%
		Grand Totals:	4,002,452	238	100%	100%

Table 3 - Operating Incomes and Basic User Data

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table depicts user statistics, customer growth, and system incomes and across the board "inflationary" style rate increases through the 10th year.

Annual Median Household Income (AMHI)

$61,387	Census Bureau estimate of AMHI for the year 2021
$35,046	Census Bureau estimate of AMHI for the year 2000
$26,341	AMHI growth during this time period
3.58%	Simple annual income growth rate during this time period (used to project future household incomes)

Test Year Growth of Customer Base and Average Tap Fee Paid per Connection

0	Number new Water connections made during test year
$0	Average Water tap or installation fee assessed during the test year

This model is programmed for rates to be reset in the "Analysis Year," also called the "0 Year" column below (heading highlighted blue). Revenues will be collected at the now-current rates for the first part of the analysis year and the modeled rates for the last part of the analysis year. Thus, the revenues shown that column of the table are "blended" revenues; part collected at the old rates and part collected at the new rates. It was then assumed that all rate adjustments made after the initial (major) adjustment will be done annually on approximately the anniversary of the first adjustment. If rates will not be adjusted during the "0 Year," an adjustment (normally a revenue reduction) was calculated below to account for the late start in making the first adjustments.

Basic User (Customer) Data

(First year balances and incomes are actual, subsequent years are projected.)	Inflation/ Deflation (–) Factor	Test Year	Analysis Year 0 Year	Years Following the Analysis Year (for Which Results Have Been Projected) 1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
		Starting 1/1/22	Starting 1/1/23	Starting 1/1/24	Starting 1/1/25	Starting 1/1/26	Starting 1/1/27	Starting 1/1/28	Starting 1/1/29	Starting 1/1/30	Starting 1/1/31	Starting 1/1/32	Starting 1/1/33
Rate Increases Projected for Future Years	N.A.	N.A.	N.A.		4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
				The row above shows the rate at which user charge fees should be increased for each year beyond the initial rate adjustment year. Unless stated otherwise, these should be across-the-board increases to all rates and fees and that should continue until a new rate analysis is done.									
Average Number of Customers	N.A.	238	238	238	238	238	238	238	238	238	238	238	238
Customers Added or Lost (-) Each Year	N.A.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Customer Growth or Loss (-) Rate	N.A.	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Test Year (Actual) and Projected Future Years' Sales, in Cu Ft	N.A.	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452	4,002,452
Calculated User Charge Fees, Accounting for New Customers and Future Rate Increases Over the Years													
Actual or Calculated Sales Revenues		$148,607	$286,957	$326,178	$339,225	$352,794	$366,906	$381,582	$396,845	$412,719	$429,228	$446,397	$464,253
Additional Sales Revenues From New Customers			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Calculated Revenues (User Charge Fees)		$148,607	$286,957	$326,178	$339,225	$352,794	$366,906	$381,582	$396,845	$412,719	$429,228	$446,397	$464,253
Operating Incomes													
User Charge Fees	N.A.	$115,721	$223,454	$253,995	$264,155	$274,721	$285,710	$297,139	$309,024	$321,385	$334,240	$347,610	$361,514
Late Payment Charge	N.A.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Taps or Connections (Current Rate Structure)	% Above	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Adjusted Meter Size-based System Development Fees (Tables 13, 14, if applicable)	% Above	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Interest Income	N.A.	$0	-$1,258	-$1,019	-$906	$11	$371	$818	$1,252	$1,566	$1,974	$2,367	$2,627
Taxes (Kern County for ICSD)	N.A.	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368	$88,368
Revenue Loss Because Rate Adjustments Made This Number of Months Late	3.0	$0	$0	-$41,256	$0	$0	$0	$0	$0	$0	$0	$0	$0
Revenue Loss (-) Due to Conservation	20.0%	$0	-$12,043	-$3,054	-$1,355	-$1,409	-$1,465	-$1,524	-$1,585	-$1,648	-$1,714	-$1,783	-$1,854
Total Operating Incomes		**$204,089**	**$298,521**	**$297,034**	**$350,262**	**$361,691**	**$372,984**	**$384,800**	**$397,059**	**$409,671**	**$422,868**	**$436,562**	**$450,655**

Table 4 - Operating Costs and Net Income

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table depicts expenses during the test year, this year and for the next 10 years. Some future costs will experience inflation. Those costs that go up as use goes up are increased by the cost inflation factor plus the growth rate in users.

(First year costs and net incomes are actual, subsequent years are projected.)

			Analysis Year	Years Following the Analysis Year (for Which Results Have Been Projected)									
Expense Items	Inflation/ Deflation (–) Factor	Test Year Starting 1/1/22	0 Year Starting 1/1/23	1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Estimated Total Expenses	4.0%	$267,000	$277,680	$288,787	$300,339	$312,352	$324,846	$337,840	$351,354	$365,408	$380,024	$395,225	$411,034
One-time Reduction of R&R Annuity	0.0%	-$3,514	-$3,514	-$879	$0	$0	$0	$0	$0	$0	$0	$0	$0
One-time Transfer to R&R Reserve	0.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual Payment to R&R Reserve (Table 7)	0.0%	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514	$3,514
User Charge Analysis Services	5.0%	$0	$8,863	$0	$0	$9,771	$0	$0	$10,773	$0	$0	$11,877	$0
Total CIP-related Payouts	N.A.	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5
Total Operating Costs		**$267,000**	**$286,543**	**$291,423**	**$303,853**	**$325,638**	**$328,361**	**$341,355**	**$365,641**	**$368,922**	**$383,539**	**$410,617**	**$414,549**
Net Income (or Loss)		-$62,911	$11,978	$5,611	$46,409	$36,053	$44,624	$43,446	$31,418	$40,749	$39,329	$25,946	$36,106
Working Capital Goal: 75%	In Dollars, That is:	$200,250	$214,907	$218,567	$227,890	$244,229	$246,271	$256,016	$274,231	$276,692	$287,654	$307,963	$310,911

Notes: Total expenses above were estimated by a District board member because the system has come through a tumultuous period with a large drop in income and unusual expenses. Regular data sources are not available at this time. This is the best available information. Normally, expenses are broken out by type, making cost classification possible. Because GGR did rate analysis for the District in 2013, the system-wide average cost classification percentages were used for the expenses in this table.

Table 5 - Capital Improvement Program (CIP)

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table depicts capital improvements and their funding. Costs reflect inflation.

	Analysis Year	Years Following the Analysis Year (for Which Improvement Projects, Costs, Funding, etc. Have Been Projected)									
Test Year Starting	0 Year Starting	1st Year Starting	2nd Year Starting	3rd Year Starting	4th Year Starting	5th Year Starting	6th Year Starting	7th Year Starting	8th Year Starting	9th Year Starting	10th Year Starting
1/1/22	1/1/23	1/1/24	1/1/25	1/1/26	1/1/27	1/1/28	1/1/29	1/1/30	1/1/31	1/1/32	1/1/33
Planned Spending, Debt-paid Portion of Projects (CIP costs to be funded with loans are shown in this section.)											
No Big Projects Anticipated	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Loan Closing Costs, Estimated at: 2.5%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Debt-paid Portion of Projects	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Planned Spending, Grant-paid Portion of Projects (CIP costs to be grant-funded are shown here.)											
No Big Projects Anticipated	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Grant-paid Portion of Projects	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Planned Spending, Cash-paid Portion of Projects (CIP costs to be funded from reserves are shown here.)											
No Big Projects Anticipated	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Grant Acquisition Costs, Estimated at: 2.5%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cash-paid Portion of Projects	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total CIP Costs	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Debt Repayment											
Existing Debt Payments (Following is debt that was initiated during the test year or earlier.)											
No Existing Debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Debt Payments (Following are payments for projects to be paid with new debt. It is assumed these will be loan/lease-financed for a term of: 20 years at a 2.0% interest rate.)											
No New Debt Anticipated		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Debt Payments	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total CIP-related Payouts	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
(This is the total cash required for this CIP and debt payment schedule. These amounts must come from utility income, reserves or outside sources, as shown in the next section.)												
CIP Fund Sources (Following are the sources and amounts of funds expected to pay for the above CIP schedule.)												
Cash Reserves (Internal Funds)												
Debt and CIP Reserves Starting Balance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital Transferred in	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Debt and CIP Reserves Interest Earned (or Paid)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Available Internal Funds	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Available External Funds	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Available Funds	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Outcomes (This CIP spending and funding plan will result in the following cash needs and ending balances each year.)												
Total Available Funds	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total CIP-related Payouts	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Debt and CIP Reserves Ending Balances	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Notes: No significant improvement projects are expected at this time.

Table 6 - Equipment Replacement Schedule - Detailed

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

Year Beginning	Well Pump 4 Maintenance and Repair								Total Annual Replacement Costs
1/1/22	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/23	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/24	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/25	$20,000	$0	$0	$0	$0	$0	$0	$0	$20,000
1/1/26	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/27	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/28	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/29	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/30	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/31	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/32	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/33	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/34	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/35	$20,000	$0	$0	$0	$0	$0	$0	$0	$20,000
1/1/36	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/37	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/38	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/39	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/40	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/41	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/42	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/43	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/44	$0	$0	$0	$0	$0	$0	$0	$0	$0
1/1/45	$20,000	$0	$0	$0	$0	$0	$0	$0	$20,000
1/1/46	$0	$0	$0	$0	$0	$0	$0	$0	$0

Table 7 - Equipment Replacement Annuity Calculation
Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table calculates the annual annuity (savings deposit) needed to build replacement (R&R) reserves. This annuity amount should actually be deposited in a savings account. The annuity amount, called the "Required Annual Deposit (Annuity) to Replacement Account" below, should be included in the utility's general budget as a cost. As a result, all replacement and refurbishment scheduled in Table 6, the detailed replacement schedule, would be paid for out of R&R reserves and not out of the utility's general budget.

In simple terms, the annuity at the bottom of this table should be deposited into an account each year and R&R projects should be paid for out of that account.

4.00%	Average Inflation Rate for the Following Water System Equipment for the Term of This Replacement Schedule
2.00%	Average Interest Rate on Balances Invested for the Term of This Replacement Schedule
2.00%	Average Interest Rate on Amounts Borrowed for the Term of This Replacement Schedule

Year Beginning	Schedule Year	This Year's Costs in Current Dollars	Future Annual Inflated Net Costs	Interest Earned on Prior Balance	End of Year Balance in Future Dollars	Minimum Desired End of Year Balance in Future Dollars
1/1/22	Analysis Year	$0	$0	$0	$0	$6,000
1/1/23	1st Year	$0	$0	$0	$3,514	$6,240
1/1/24	2nd Year	$0	$0	$70	$7,099	$6,490
1/1/25	3rd Year	$20,000	$22,497	$142	-$11,742	$6,749
1/1/26	4th Year	$0	$0	-$235	-$8,462	$7,019
1/1/27	5th Year	$0	$0	-$169	-$5,117	$7,300
1/1/28	6th Year	$0	$0	-$102	-$1,705	$7,592
1/1/29	7th Year	$0	$0	-$34	$1,775	$7,896
1/1/30	8th Year	$0	$0	$35	$5,325	$8,211
1/1/31	9th Year	$0	$0	$106	$8,946	$8,540
1/1/32	10th Year	$0	$0	$179	$12,639	$8,881
1/1/33	11th Year	$0	$0	$253	$16,406	$9,237
1/1/34	12th Year	$0	$0	$328	$20,249	$9,606
1/1/35	13th Year	$20,000	$33,301	$405	-$9,134	$9,990
1/1/36	14th Year	$0	$0	-$183	-$5,802	$10,390
1/1/37	15th Year	$0	$0	-$116	-$2,404	$10,806
1/1/38	16th Year	$0	$0	-$48	$1,063	$11,238
1/1/39	17th Year	$0	$0	$21	$4,598	$11,687
1/1/40	18th Year	$0	$0	$92	$8,205	$12,155
1/1/41	19th Year	$0	$0	$164	$11,883	$12,641

Notes: This R&R schedule only includes bringing the Well Pump 4 on-line as a "place keeper." A Discretionary Annuity amount was added so that at the end of the 20-year modeling period, the balance will equal three times the average of the annual replacement cost amounts, not including interest paid for borrowing during the negative balance years.

Starting Account Balance	$0
Minimum Annual Annuity	$2,994
Discretionary Annuity	$520

Required Annual Deposit (Annuity) to Replacement Account **$3,514**

(This amount is included in Table 4 as an operating cost.)

Table 8 - Average Cost Classification

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table distributes costs from a representative year (the "average rate structure basis year) to fixed and variable categories (see Definitions) in order to calculate the "cost of service" rate structure for that year.

The average rate structure basis year runs from: 1/1/2027 through 12/31/2027

Cost Items During the Basis Year	Cost During Basis Year	Fixed Cost %	Variable Cost %	Fixed Cost	Variable Cost
Estimated Total Expenses	$324,846	33.3%	66.7%	$108,271	$216,575
Note: Because detailed cost data is not now available, the "Fixed Cost %" value came from the rate analysis model prepared for Inyokern in 2013.					
Annual Payment to R&R Reserve (Table 7)	$3,514	33.3%	66.7%	$1,171	$2,343
User Charge Analysis Services	$0	33.3%	66.7%	$0	$0
Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)	-$30,104	33.3%	66.7%	-$10,034	-$20,070
Grand Total Costs, Weighted Avg Percentages	$298,257	33.3%	66.7%	$99,409	$198,848

Bases for Cost to Serve Rate Structure

		100%	$298,257
Number Customers During Basis Year	238	Unbilled-for Water for the test year is Estimated at	50%
Billed Volume, in Cu Ft, During Basis Year	4,002,452	Unbilled-for Water is Estimated at This % of Average Cost (Marginal Cost)	38%
Average Fixed Cost per User per Month During Basis Year	$34.76	At Recommended Unit Charge Rates, Resulting Marginal Cost of Unbilled-for Water	$64,801
Average Variable Cost to Produce per 100 Cu Ft During Basis Year	$4.97	Test Year Customer Volume, in Cu Ft	4,002,452
Cu Ft per Billing Cycle Used by Average Residential Customer	1,399	+ Test Year Unbilled-for Water, in Cu Ft	3,988,457
		Total Test Year Volume, in Cu Ft, From Master Meter Readings	7,990,909

Table 9 - Marginal Cost Classification

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

The utility incurs "marginal" costs. These costs are unavoidable. Thus, the utility must collect minimal fees from various customers to "break even" on a marginal cost basis. Costs vary by customer type and volume used.

Below, it is assumed that marginal variable costs are being calculated for: Unaccounted-for Water

(Fixed costs are irrelevant in this case)

The marginal rate structure basis year runs from: 1/1/2027 through 12/31/2027

Cost Items During the Basis Year	Fixed Cost	Variable Cost	Marginal Fixed Cost %	Marginal Variable Cost %	Marginal Fixed Cost	Marginal Variable Cost
Estimated Total Expenses	$108,271	$216,575	19%	38%	$20,708	$82,855
Note: Because detailed cost data is not now available, the "Marginal Fixed Cost %" and the "Marginal Variable Cost %" values came from the rate analysis model prepared for Inyokern in 2013.	$0	$0	19%	38%		
Annual Payment to R&R Reserve (Table 7)	$1,171	$2,343	19%	38%	$224	$896
User Charge Analysis Services	$0	$0	19%	38%	$0	$0
Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)	-$10,034	-$20,070	19%	38%	-$1,919	-$7,678
Grand Total All Costs	$99,409	$198,848			$19,013	$76,074
	$298,257				$95,086	

Marginal Fixed and Variable Cost Bases (For the Customer Type(s) Listed Above)	Monthly Marginal Fixed Cost per Customer	Marginal Variable Cost per 100 Cu Ft
	$6.65	
Marginal Fixed Cost as a Percent of Total Fixed Cost:	19%	$1.90
Marginal Variable Cost as a Percent of Total Variable Cost:		38%

Table 10 - Initial Rate Adjustments and Resulting Revenues

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table calculates a new set of user charge rates and the revenues they would generate.

Premium for Out-of-District Service	150%	Conservation Rate Block Multiplier	100%	Other Multiplier	100%

3/1/23 Date when fees will first be collected at adjusted rates. Actual adjustment should occur one billing cycle earlier.

After rate adjustments are made, customers will be billed monthly.

Following are Blended Sales Revenues: Sales at the current (Test Year) rates (gray highlighted column) will apply until rates are adjusted. Sales at the modeled rates (yellow highlighted column) would apply after the modeled rates are adopted. Adding both together, the "blended" sales revenues show in the right-most column.

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 100s	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
All Metered Customers	0	133	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	134	266	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	267	400	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	401	534	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	535	667	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	668	801	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	802	935	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	936	1,069	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	1,070	1,202	$1,082	$43.61	0.000	$4.72	$15,130	$16,211
	1,203	1,398	$1,588	$43.61	0.000	$4.72	$22,210	$23,798
	1,399	1,398	$12,699	$43.61	0.000	$4.72	$104,557	$117,256
	1,399	1,599	$0	$43.61	0.000	$4.72	$0	$0
Bulk Water	0	133	$0	$0.00	0.000	$20.12	$0	$0
	6,937	6,938	$0	$0.00	0.000	$20.12	$0	$0
Total Rate Revenue at Current Rates			$24,021	Total Rate Revenue at Modeled Rates			$262,936	
						Total Blended Rate Revenues for the Year		$286,957

Note: New Minimum Charge Base Rates: If meter size-based minimum charges are to be used, and the user classes modeled above include meter or connection sizes, the amounts shown in this column include meter size surcharges as calculated in Table 16. Either way, the narrative report includes the rates and surcharges to assess.

1.9	months at the old user charge rates	and	10.1	months at the new user charge rates.

Table 11 - AWWA Safe Operating Flow by Meter Size

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

Water meter data source: Table VII.2-5, page 338, American Water Works Association Manual M1, Principles of Water Rates, Fees and Charges, Seventh Edition

Fire sprinkler data source: National Fire Protection Association

This table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers.

Meter Size, in Inches	Meter Type	Maximum-Rated Safe Operating Flow, in gallons per minute	Meter Equivalent Ratio (Capacity Shares)	Equivalent Fire Sprinkler Square Footage*
Five Eighths	Displacement	20	1.0	100
Three Quarters	Displacement	30	1.5	150
One Inch	Displacement	50	2.5	250
One & a Half Inch	Displacement	100	5.0	500
Two Inch	Displacement	160	8.0	800
Three	Singlet	320	16.0	1,600
Three	Compound, Class I	320	16.0	1,600
Three	Turbine, Class I	350	17.5	1,750
Four	Singlet	500	25.0	2,500
Four	Compound, Class I	500	25.0	2,500
Four	Turbine, Class I	630	31.0	3,150

* If applicable, see Table 12B for sprinkler calculations and explanations.

Table 12 - Flow Capacity Costs

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

Building system capacity and connecting new customers to the system costs money. Those costs must be recovered. That can be done on the "front end" with system development fees and connection fees. It can be done later with system development surcharges to the minimum charge. It is usually most practical to use a blend of both. This table shows capacity costs. From these costs, system development fees and surcharges were developed in Tables 13 through 16.

Peak and Base Flow Capacity Costs

	Costs Related to Water Service						
Fixed Assets Original Value (Capacity Cost)	% of That Value Attributable to Regular Water Service	% Attributable to Water Peak Capacity	Peak Water Capacity Cost	Annual Water Peak Capacity Cost (40-year Depreciation)*	% of Value Attributable to Water Base Flow Capacity	Base Flow Capacity Cost for Water Service	Annual Water Base Capacity Cost (40-year Depreciation)*
$1,191,667	100.0%	50.0%	$595,833	$30,104	50.0%	$595,833	$30,104

*** It is assumed full system replacement costs will escalate each year by: 4.0%**

How Water System Capacity Costs Will Be Recovered

These costs are modeled to be recovered from minimum charge surcharges in Tables 15 and 16

Part of Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

100%	Target Percentage of Costs to Recover
$30,103.58	Target Portion of Costs to Recover in One Full Year
$2,508.63	Target Portion of Costs to Recover in Monthly Surcharges
$10.58	Monthly Surcharge per Peak Capacity Share

Table 15 - Minimum Charge Fees, Including Capacity Surcharges

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table does, essentially, the same thing as Table 13, except costs are recovered over time as minimum charge surcharges.

Meter Size	Meter Type	Capacity Shares Each Meter Size After Adjustment	Monthly Surcharge per Peak Capacity Share (Table 11)	Peak Capacity Cost per Meter Size	Cost-to-Serve Minimum Charge From Table 10	**Monthly Minimum Charge, Including Peak Capacity**
Five Eighths	Displacement	1.0	$10.58	$10.58	$33.02	**$43.61**
Three Quarters	Displacement	1.0	$10.58	$10.58	$33.02	**$43.61**
One Inch	Displacement	2.5	$10.58	$26.46	$33.02	**$59.48**
One & a Half Inch	Displacement	5.0	$10.58	$52.92	$33.02	**$85.95**
Two Inch	Displacement	8.0	$10.58	$84.68	$33.02	**$117.70**
Two & a Half Inch	Displacement	12.5	$10.58	$132.31	$33.02	**$165.33**
Three Inch	Singlet	16.0	$10.58	$169.36	$33.02	**$202.38**
Three Inch	Compound, Class I	16.0	$10.58	$169.36	$33.02	**$202.38**
Three Inch	Turbine, Class I	17.5	$10.58	$185.24	$33.02	**$218.26**
Four Inch	Singlet	25.0	$10.58	$264.62	$33.02	**$297.65**
Four Inch	Compound, Class I	25.0	$10.58	$264.62	$33.02	**$297.65**
Four Inch	Turbine, Class I	31.0	$10.58	$328.13	$33.02	**$361.16**

Table 16 - Revenues From Minimum Charge Surcharges
Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table calculates total minimum charge surcharge revenues that would be generated during one full year at the fees in Table 15.

Meter Size	Meter Type	Number Meters This Size	Total Adjusted Capacity Shares	**Annual Peak Capacity Surcharge Revenues**
Five Eighths	Displacement	237	1	**$30,104**
Three Quarters	Displacement	0	1	**$0**
One Inch	Displacement	0	3	**$0**
One & a Half Inch	Displacement	0	5	**$0**
Two Inch	Displacement	0	8	**$0**
Two & a Half Inch	Displacement	0	13	**$0**
Three Inch	Singlet	0	16	**$0**
Three Inch	Compound, Class I	0	16	**$0**
Three Inch	Turbine, Class I	0	18	**$0**
Four Inch	Singlet	0	25	**$0**
Four Inch	Compound, Class I	0	25	**$0**
Four Inch	Turbine, Class I	0	31	**$0**
		237	4,907	**$30,104**

Table 17 - Financial Capacity Indicators and Reserves

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

This table depicts the affordability of future rates, the financial health of the system and the ending balances in various (assumed) accounts for the test year and the next 10 years.

	Capacity Indicators	Test Year Starting 1/1/22	0 Year Starting 1/1/23	1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Customary Affordability Index	Monthly Bill for a 5,000 gal per Month, Small Meter Residential Customer	$39.17	$75.16	$78.16	$81.29	$84.54	$87.92	$91.44	$95.10	$98.90	$102.86	$106.97	$111.25
	AMHI Within Service Area	$63,584	$65,860	$68,217	$70,659	$73,188	$75,807	$78,520	$81,331	$84,241	$87,257	$90,380	$93,614
	Affordability Index: Current Rates First Column, Modeled Rates After That	0.74%	1.37%	1.37%	1.38%	1.39%	1.39%	1.40%	1.40%	1.41%	1.41%	1.42%	1.43%
	National Average Affordability Index: Commonly Accepted but Not Statistically Verifiable	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the cost of 60,000 gallons of residential service per year (5,000 gallons per month) divided by the Annual Median Household Income (AMHI) in the service area (gleaned from Census data or a survey). Rates near 1.0% are common in the U.S. and are generally considered affordable. Most grant agencies will decline to award grants if the AI is less than 1.5 to 2.0%, unless other eligibility criteria considered along with the AI make an applicant eligible.												
Low-income, Low-volume "Affordability Index"	Monthly Bill for a 2,000 gal per Month, Low-income Residential Customer	$32.15	$56.23	$58.48	$60.82	$63.25	$65.78	$68.41	$71.15	$73.99	$76.95	$80.03	$83.23
	Income at One-half the AMHI and Rising at One-half the Rate Above	$31,792	$32,361	$32,940	$33,530	$34,130	$34,740	$35,362	$35,995	$36,639	$37,295	$37,962	$38,641
	Affordability for Low-income, Low-volume: Current Rates First Column, Modeled Rates After That	1.21%	2.09%	2.13%	2.18%	2.22%	2.27%	2.32%	2.37%	2.42%	2.48%	2.53%	2.58%
	This additional indicator of affordability assumes a residential customer with income at one-half the median household income above, that income is growing at one-half the rate of the median household income and the customer uses 2,000 gallons per month. Such a customer is likely either a minimum wage or near-minimum wage worker, or is retired and living only on Social Security benefits. Such customers are more commonly the "slow pays" and "no pays" compared to others, so this indicator goes to the "business sense" of the rates modeled here. In other words, raise this customer's bill too much and they are more likely to pay late or not pay.												

Table 17 - Financial Capacity Indicators and Reserves

Estimated Operating Ratio: Current Rates First Column, Modeled Rates After That	0.76	1.04	1.02	1.15	1.11	1.14	1.13	1.09	1.11	1.10	1.06	1.09

Operating ratio (OR) is a measure of the utility's ability to pay its operating expenses using only current incomes. A 1.0 OR is break even. Below 1.0 indicates operating in the "red." Generally, the OR should be at least 1.15 for large systems, 1.30 or more for medium-sized systems and perhaps as high as 2.0 for small systems. Note: If the utility has or will have reserves (below,) it has more ability to pay its operating costs than this calculation of OR implies.

Estimated Coverage Ratio: Current Rates First Column, Modeled Rates After That	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments out of current incomes. CR applies only to years with debt service. A "N.A." above indicates there was not, or in a future year there will not be debt during that year. 1.0 is break even - just enough net revenue to pay debt. Generally, the CR should be at least 1.25. Note: If the utility has or will have other available reserves (shown below,) it has more ability to make debt payments than the CR implies. That is covered by the Alternative Coverage Ratio that follows next.

Alternative Coverage Ratio: Current Rates First Column, Modeled Rates After That	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

This Alternative Coverage Ratio (ACR) is based on the same notion as the classic coverage ratio above, except it includes reserves that are available to pay debt service. With the classic CR, a utility could build reserves early on with current net revenues, but then future rates may not be high enough to show a strong CR. The classic CR could even go negative. But in reality, the utility could have quite strong reserves with which to pay debt. Thus, the Alternative Coverage Ratio can be a better indicator of a utility's true ability to pay debt.

Reserves	Balance Ending on 12/31/21	Balance Ending on 12/31/22	Balance Ending on 12/31/23	Balance Ending on 12/31/24	Balance Ending on 12/31/25	Balance Ending on 12/31/26	Balance Ending on 12/31/27	Balance Ending on 12/31/28	Balance Ending on 12/31/29	Balance Ending on 12/31/30	Balance Ending on 12/31/31	Balance Ending on 12/31/32	Balance Ending on 12/31/33
Cash and Cash Equivalents	$0	-$62,911	-$50,934	-$45,323	$1,086	$37,139	$81,763	$125,209	$156,627	$197,376	$236,705	$262,651	$298,757
Other Liquid Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Undedicated Cash Assets	$0	-$62,911	-$50,934	-$45,323	$1,086	$37,139	$81,763	$125,209	$156,627	$197,376	$236,705	$262,651	$298,757
Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power)	$0	-$62,911	-$50,934	-$47,211	$1,001	$32,859	$69,445	$102,092	$122,601	$148,317	$170,757	$181,895	$206,899
Repair & Replacement	$0	$0	$3,514	$7,099	-$11,742	-$8,462	-$5,117	-$1,705	$1,775	$5,325	$8,946	$12,639	$16,406
Debt and CIP Reserves	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sum of All Reserves	$0	-$62,911	-$47,419	-$38,224	-$10,656	$28,677	$76,646	$123,504	$158,402	$202,701	$245,651	$275,290	$315,163

Table 18 - Bills Before and After Rate Adjustments

Inyokern Community Services District, Inyokern, California, Water Rates Model 2023-2

Individual bills would change as shown in the following table. Note: The actual rates to adopt or consider are included in the narrative report.

Customer, Rate Class or Meter Size	Cu Ft of Use	Customers Using This Volume or Less	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
All Metered Customers	0	0	$27.47	$43.61	$16.14	59%
	134	0	$29.81	$49.92	$20.11	67%
	267	0	$32.15	$56.23	$24.08	75%
	401	0	$34.49	$62.54	$28.05	81%
	535	0	$36.83	$68.85	$32.02	87%
	668	0	$39.17	$75.16	$35.99	92%
	802	0	$41.51	$81.47	$39.96	96%
	936	0	$43.85	$87.78	$43.93	100%
	1,070	0	$46.19	$94.09	$47.90	104%
	1,203	0	$48.53	$100.40	$51.87	107%
	1,399	238	$51.96	$109.66	$57.70	111%
	1,399	0	$51.96	$109.66	$57.70	111%
	1,600	0	$55.61	$119.13	$63.52	114%
	2,600	0	$74.21	$166.33	$92.12	124%
	3,600	0	$93.11	$213.53	$120.42	129%
	4,600	0	$112.41	$260.73	$148.32	132%
	5,600	0	$132.01	$307.93	$175.92	133%
	5,734	0	$134.63	$314.24	$179.61	133%
	5,867	0	$137.25	$320.55	$183.30	134%
	6,001	0	$139.87	$326.86	$186.99	134%
	6,135	0	$142.49	$333.17	$190.68	134%
	6,268	0	$145.11	$339.48	$194.37	134%
	6,402	0	$147.73	$345.79	$198.06	134%
	6,536	0	$150.35	$352.10	$201.75	134%
	6,670	0	$152.97	$358.41	$205.44	134%
	6,803	0	$155.59	$364.72	$209.13	134%
	6,937	0	$158.21	$371.03	$212.82	135%

Chart 1 - Operating Ratio

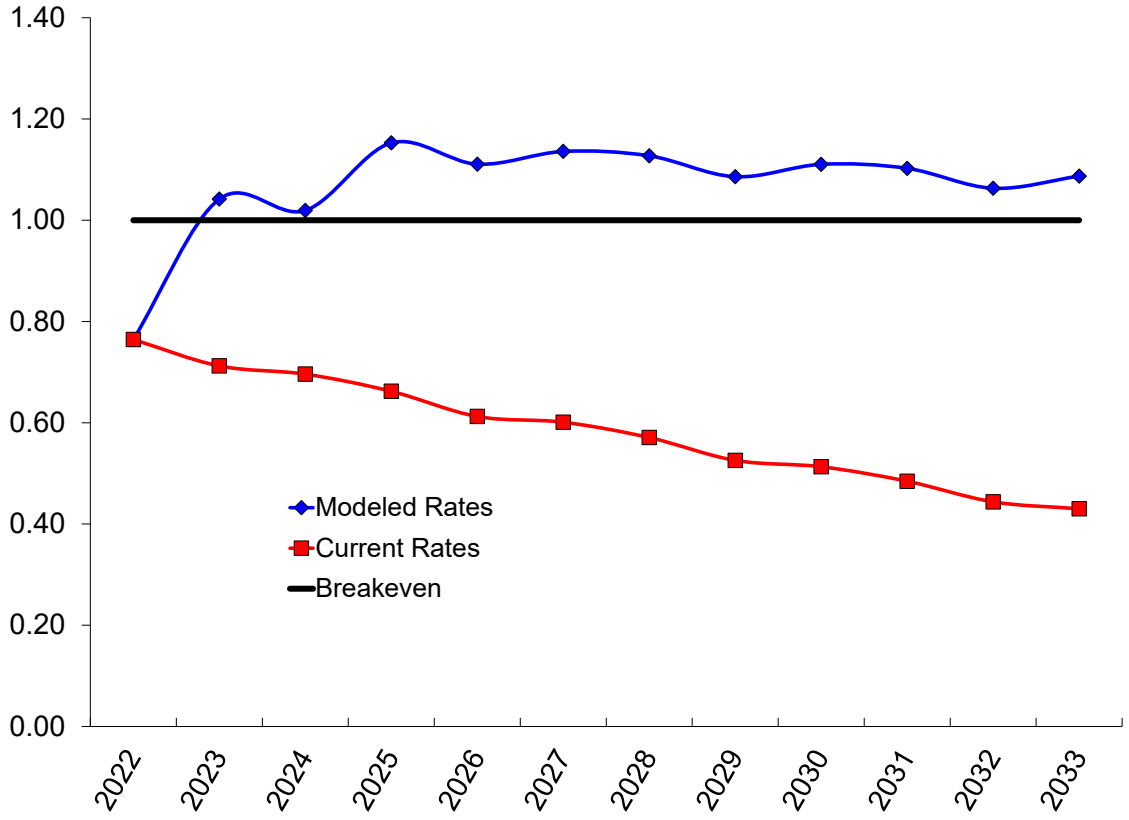


Chart 2 - Coverage Ratio

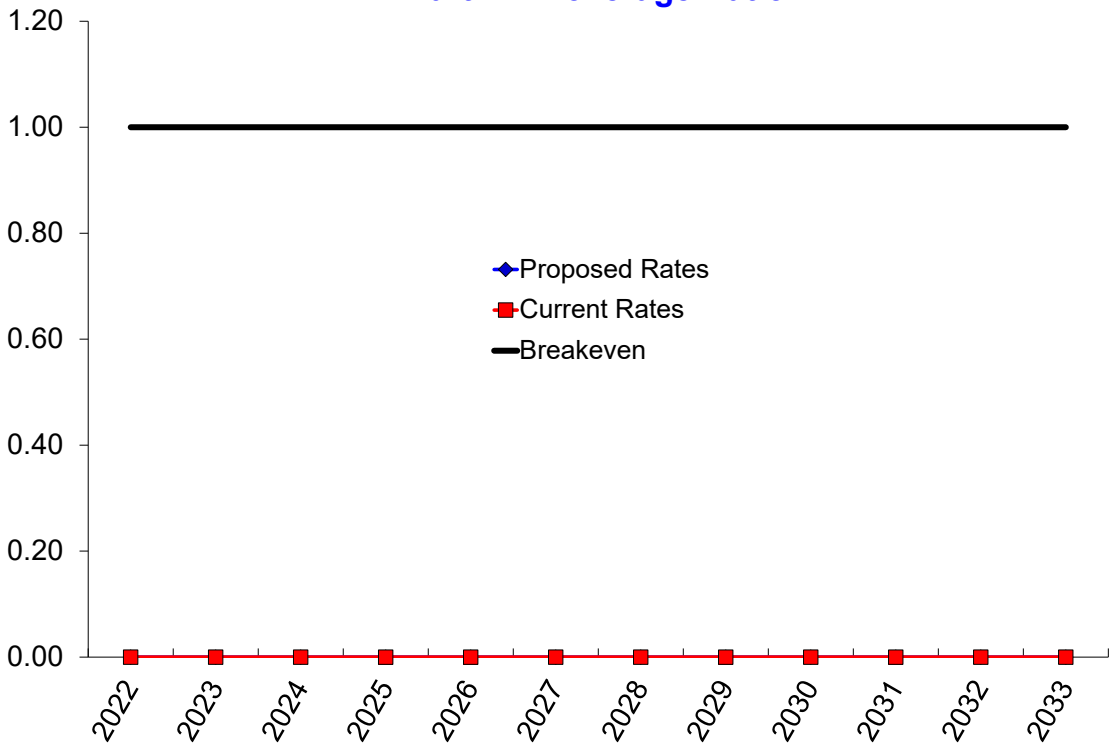


Chart 3 - Residential Users' Bills

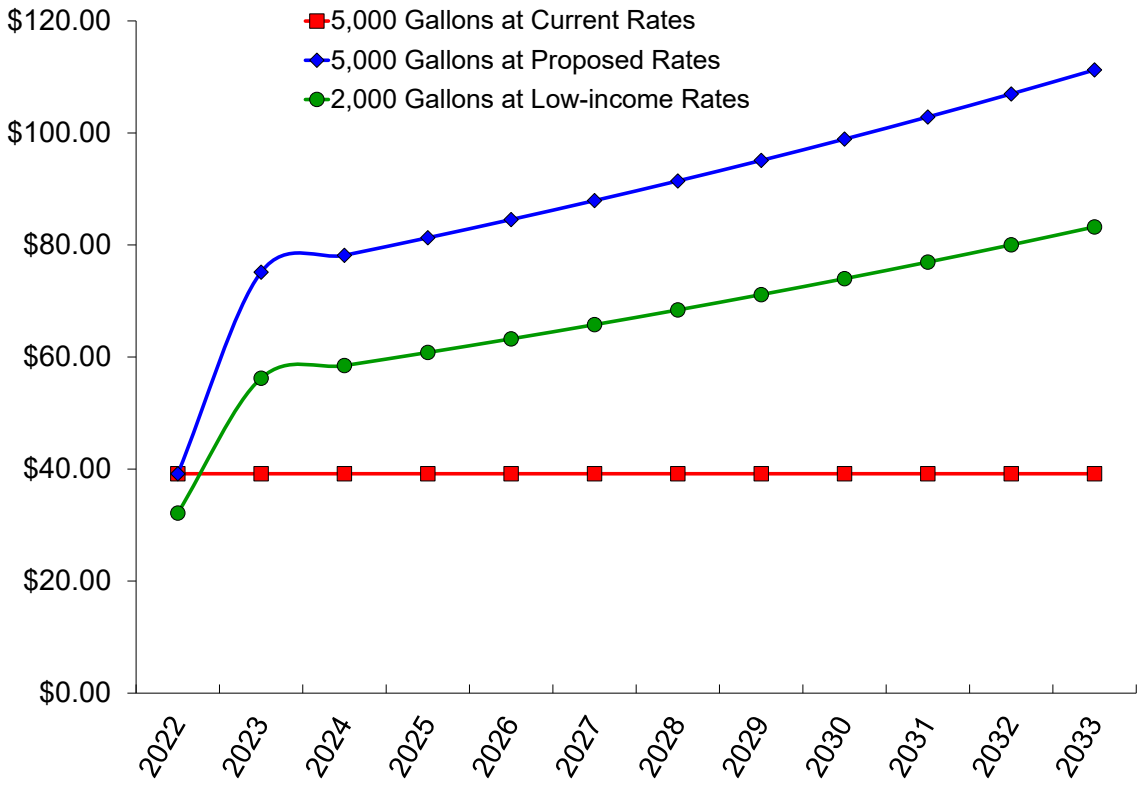


Chart 4 - Affordability

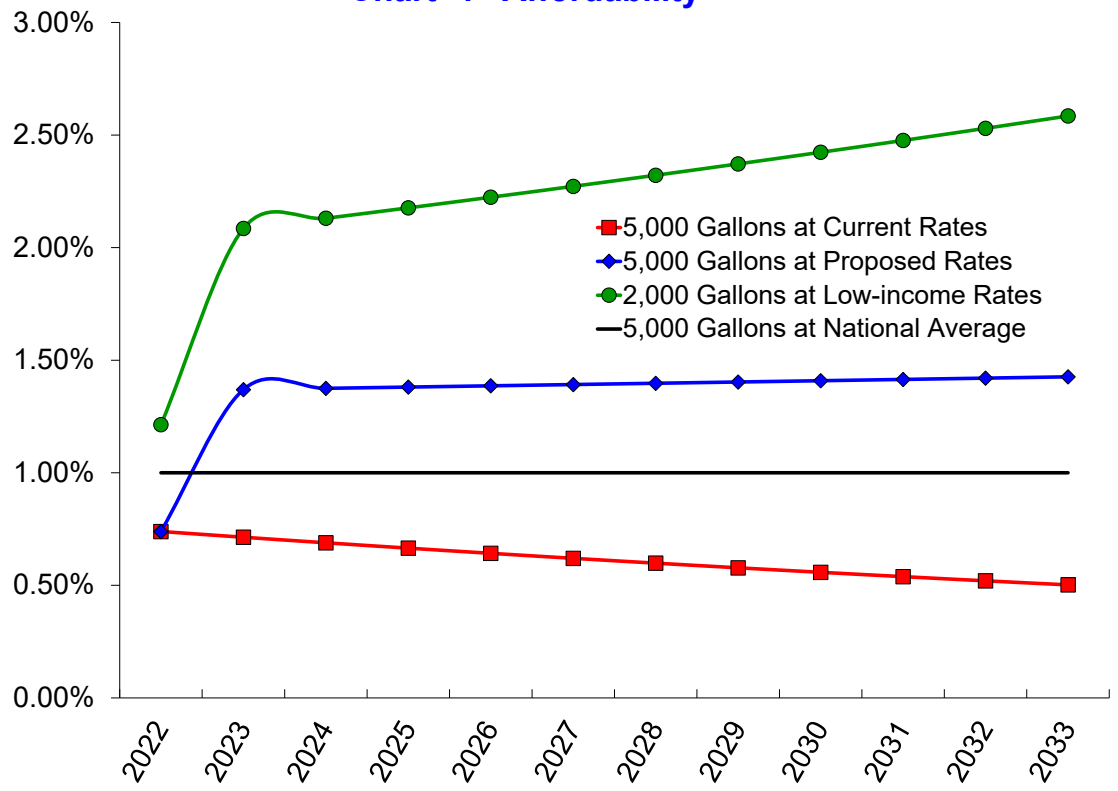


Chart 5 - Working Capital vs Goal

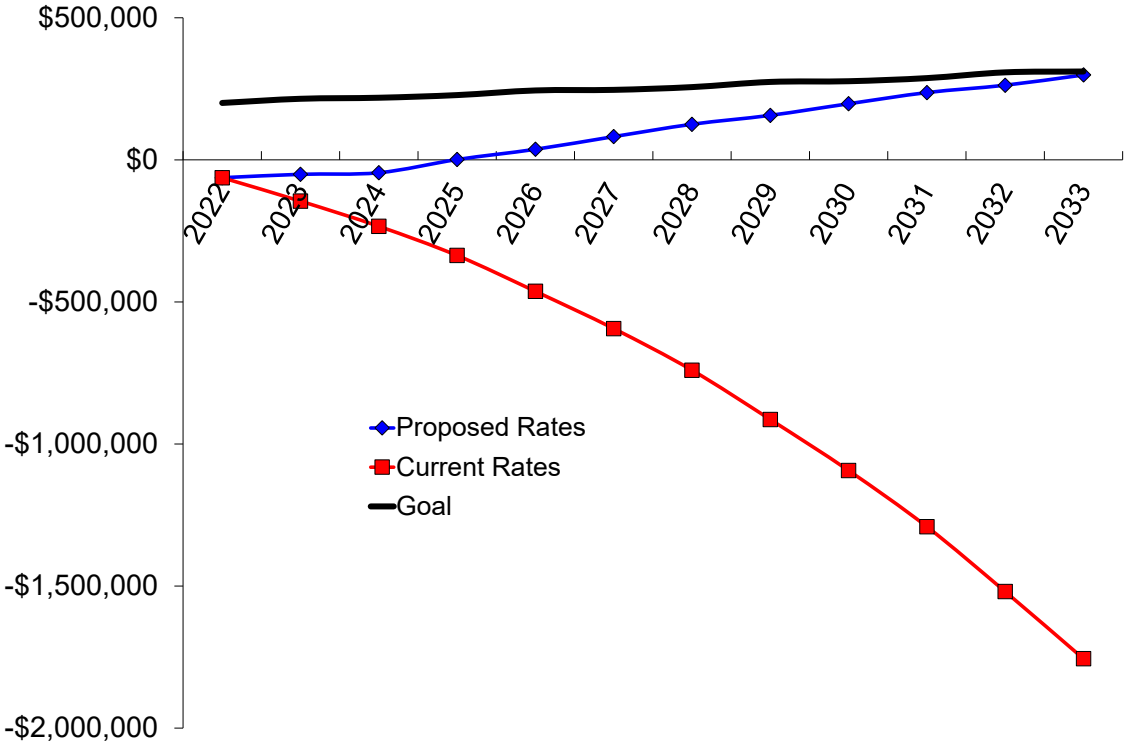


Chart 6 - Value of Cash Assets Before Inflation

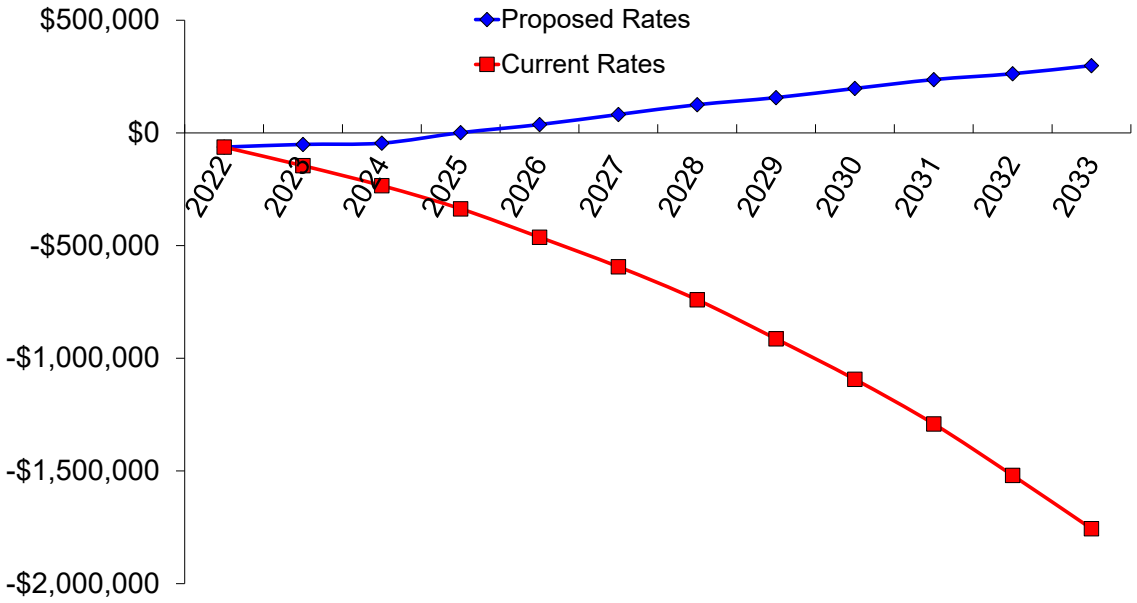


Chart 7 - Value of Cash Assets After Inflation

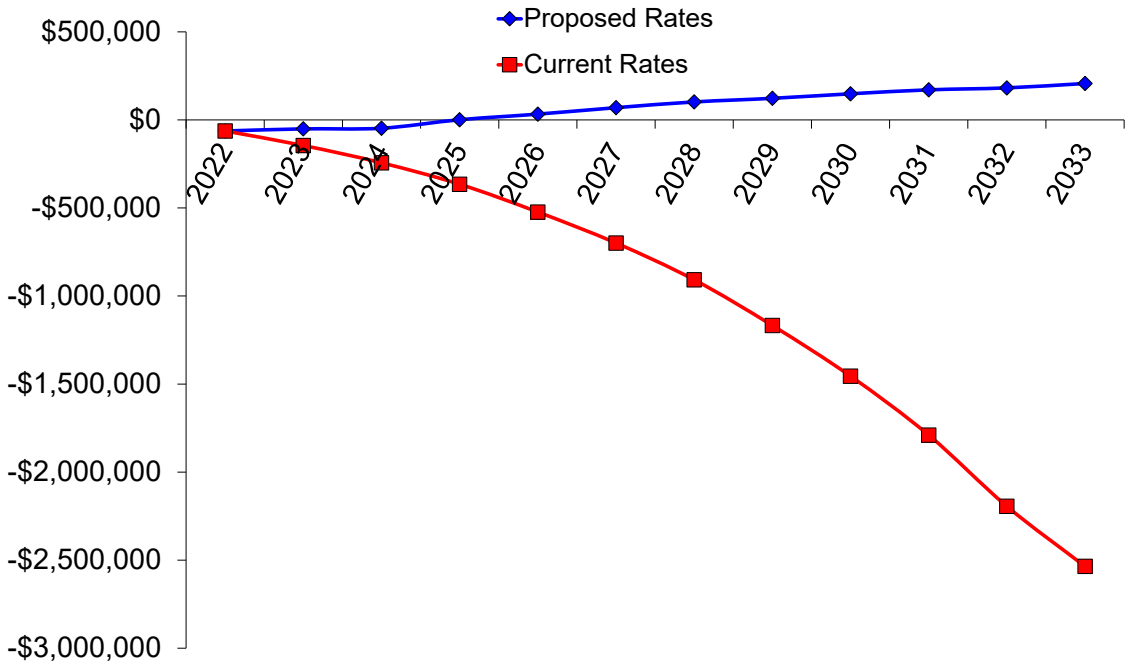
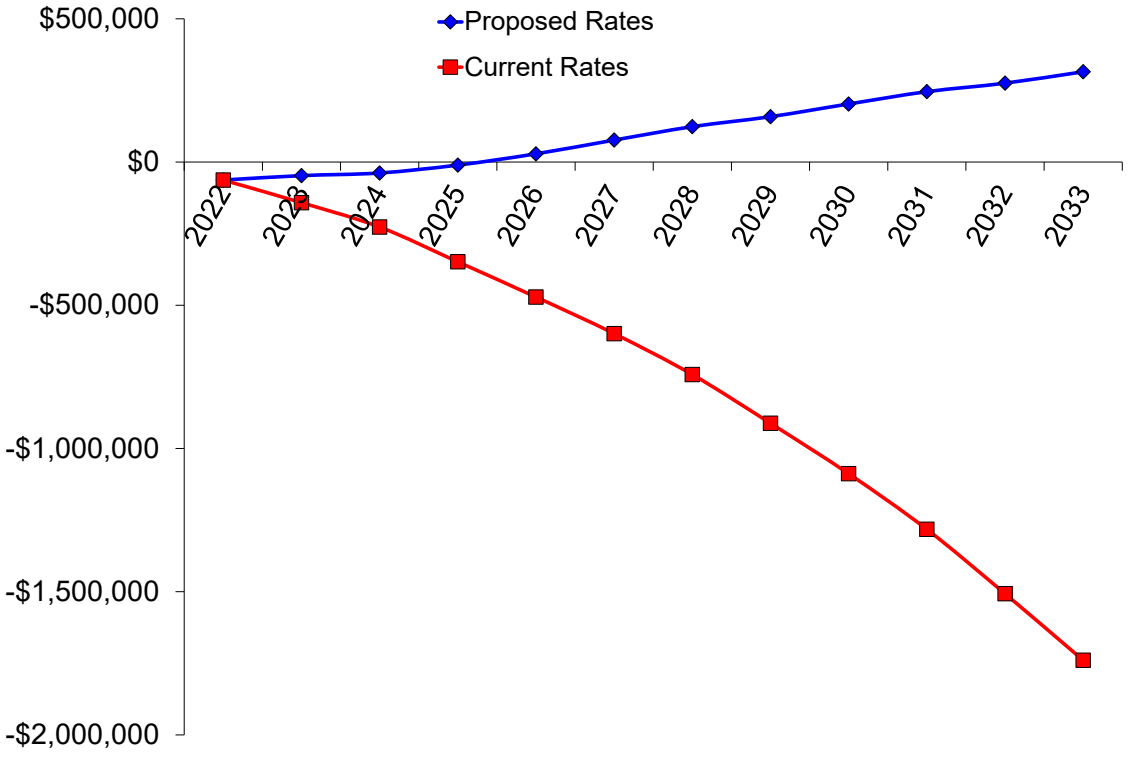


Chart 8 - Sum of All Reserves



Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This model is the same as "…Model 2" except it adds a capacity surcharge component to a base minimum charge to arrive at minimum charges that rise as meter size (peak flow capacity costs) rise.

January 9, 2024

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Note: This document is a print out of the spreadsheet model used to calculate new user charge and other rates and fees for the next 10 years. These calculations are complex and are based upon many conditions and assumptions. These issues, and others, are described in a narrative report that accompanies this model.

Table 2 - Test Year Usage

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This table shows usage by all customers during the test year.

Test year = the one-year period being analyzed starts: 1/1/2022

Date this model created: 11/30/2023

Residential meter readings per year: 12

Other customer readings per year: 12

Bills per year: 12

Customer, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Use in Each Range in Cu Ft	# of Customers That "Maxed Out" in Each Range	% of Customers That "Maxed Out" in Each Range	% of Total Use in Each Range
5/8, 3/4 Inch Meter	0	133	359,893	0	0.0%	0.0%
	134	266	359,893	0	0.0%	0.0%
	267	400	359,893	0	0.0%	0.0%
	401	534	359,893	0	0.0%	0.0%
	535	667	359,893	0	0.0%	0.0%
	668	801	359,893	0	0.0%	0.0%
	802	935	359,893	0	0.0%	0.0%
	936	1,069	359,893	0	0.0%	0.0%
	1,070	1,202	359,893	0	0.0%	0.0%
	1,203	1,398	528,305	0	0.0%	0.0%
	1,399	1,398	0	224	94.1%	94.1%
	1,399	1,599	0	0	0.0%	0.0%
			3,767,343	224	94.1%	94.1%
1 Inch Meter	0	133	8,021	0	0.0%	0.0%
	134	266	8,021	0	0.0%	0.0%
	267	400	8,021	0	0.0%	0.0%
	401	534	8,021	0	0.0%	0.0%
	535	667	8,021	0	0.0%	0.0%
	668	801	8,021	0	0.0%	0.0%
	802	935	8,021	0	0.0%	0.0%
	936	1,069	8,021	0	0.0%	0.0%
	1,070	1,202	8,021	0	0.0%	0.0%
	1,203	1,398	11,775	0	0.0%	0.0%
	1,399	1,398	0	5	2.1%	2.1%
	1,399	1,599	0	0	0.0%	0.0%
			83,968	5	2.1%	2.1%
1.5 Inch Meter	0	133	4,813	0	0.0%	0.0%
	134	266	4,813	0	0.0%	0.0%
	267	400	4,813	0	0.0%	0.0%
	401	534	4,813	0	0.0%	0.0%
	535	667	4,813	0	0.0%	0.0%
	668	801	4,813	0	0.0%	0.0%
	802	935	4,813	0	0.0%	0.0%
	936	1,069	4,813	0	0.0%	0.0%
	1,070	1,202	4,813	0	0.0%	0.0%
	1,203	1,398	7,065	0	0.0%	0.0%
	1,399	1,398	0	3	1.3%	1.3%
	1,399	1,599	0	0	0.0%	0.0%
			50,381	3	1.3%	1.3%

Table 2 - Test Year Usage

Customer, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Use in Each Range in Cu Ft	# of Customers That "Maxed Out" in Each Range	% of Customers That "Maxed Out" in Each Range	% of Total Use in Each Range
	0	133	6,417	0	0.0%	0.0%
	134	266	6,417	0	0.0%	0.0%
	267	400	6,417	0	0.0%	0.0%
	401	534	6,417	0	0.0%	0.0%
	535	667	6,417	0	0.0%	0.0%
	668	801	6,417	0	0.0%	0.0%
2 Inch Meter	802	935	6,417	0	0.0%	0.0%
	936	1,069	6,417	0	0.0%	0.0%
	1,070	1,202	6,417	0	0.0%	0.0%
	1,203	1,398	9,420	0	0.0%	0.0%
	1,399	1,398	0	4	1.7%	1.7%
	1,399	1,599	0	0	0.0%	0.0%
			67,174	4	1.7%	1.7%
	0	133	1,604	0	0.0%	0.0%
	134	266	1,604	0	0.0%	0.0%
	267	400	1,604	0	0.0%	0.0%
	401	534	1,604	0	0.0%	0.0%
	535	667	1,604	0	0.0%	0.0%
	668	801	1,604	0	0.0%	0.0%
3 Inch Meter (MH Park)	802	935	1,604	0	0.0%	0.0%
	936	1,069	1,604	0	0.0%	0.0%
	1,070	1,202	1,604	0	0.0%	0.0%
	1,203	1,398	2,355	0	0.0%	0.0%
	1,399	1,398	0	1	0.4%	0.4%
	1,399	1,599	0	0	0.0%	0.0%
			16,794	1	0.4%	0.4%
	0	133	1,604	0	0.0%	0.0%
	134	266	1,604	0	0.0%	0.0%
	267	400	1,604	0	0.0%	0.0%
	401	534	1,604	0	0.0%	0.0%
	535	667	1,604	0	0.0%	0.0%
	668	801	1,604	0	0.0%	0.0%
4 Inch Meter (Airport)	802	935	1,604	0	0.0%	0.0%
	936	1,069	1,604	0	0.0%	0.0%
	1,070	1,202	1,604	0	0.0%	0.0%
	1,203	1,398	2,355	0	0.0%	0.0%
	1,399	1,398	0	1	0.4%	0.4%
	1,399	1,599	0	0	0.0%	0.0%
			16,794	1	0.4%	0.4%
	0	133	0	0	0.0%	0.0%
Bulk Water	6,937	6,938	0	0	0.0%	0.0%
			0	0	0.0%	0.0%
		Grand Totals:	4,002,452	238	100%	100%

Table 10 - Initial Rate Adjustments and Resulting Revenues

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This table calculates a new set of user charge rates and the revenues they would generate.

Premium for Out-of-District Service	150%	Conservation Rate Block Multiplier	100%	Other Multiplier	100%

3/1/23 Date when fees will first be collected at adjusted rates. Actual adjustment should occur one billing cycle earlier.

If there are no special costs to consider and before capacity costs are added, if appropriate, rates for a 5/8" meter would be in a "cost-to-serve" structure when: there is no usage allowance,

the base minimum charge is $34.49 Monthly, and the unit charge is set at $4.93 per 100 Cu Ft.

After rate adjustments are made, customers will be billed monthly.

Following are Blended Sales Revenues: Sales at the current (Test Year) rates (gray highlighted column) will apply until rates are adjusted. Sales at the modeled rates (yellow highlighted column) would apply after the modeled rates are adopted. Adding both together, the "blended" sales revenues show in the right-most column.

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 100s	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
5/8, 3/4 Inch Meter	0	133	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	134	266	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	267	400	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	401	534	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	535	667	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	668	801	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	802	935	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	936	1,069	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	1,070	1,202	$1,018	$40.77	0.000	$4.93	$14,875	$15,893
	1,203	1,398	$1,494	$40.77	0.000	$4.93	$21,835	$23,330
	1,399	1,398	$11,953	$40.77	0.000	$4.93	$92,014	$103,967
	1,399	1,599	$0	$40.77	0.000	$4.93	$0	$0
1 Inch Meter	0	133	$97	$50.19	0.000	$4.93	$332	$428
	134	266	$97	$50.19	0.000	$4.93	$332	$428
	267	400	$97	$50.19	0.000	$4.93	$332	$428
	401	534	$97	$50.19	0.000	$4.93	$332	$428
	535	667	$97	$50.19	0.000	$4.93	$332	$428
	668	801	$97	$50.19	0.000	$4.93	$332	$428
	802	935	$97	$50.19	0.000	$4.93	$332	$428
	936	1,069	$97	$50.19	0.000	$4.93	$332	$428
	1,070	1,202	$97	$50.19	0.000	$4.93	$332	$428
	1,203	1,398	$142	$50.19	0.000	$4.93	$487	$629
	1,399	1,398	$0	$50.19	0.000	$4.93	$2,525	$2,525
	1,399	1,599	$0	$50.19	0.000	$4.93	$0	$0

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 100s	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
1.5 Inch Meter	0	133	$14	$65.89	0.000	$4.93	$199	$213
	134	266	$14	$65.89	0.000	$4.93	$199	$213
	267	400	$14	$65.89	0.000	$4.93	$199	$213
	401	534	$14	$65.89	0.000	$4.93	$199	$213
	535	667	$14	$65.89	0.000	$4.93	$199	$213
	668	801	$14	$65.89	0.000	$4.93	$199	$213
	802	935	$14	$65.89	0.000	$4.93	$199	$213
	936	1,069	$14	$65.89	0.000	$4.93	$199	$213
	1,070	1,202	$14	$65.89	0.000	$4.93	$199	$213
	1,203	1,398	$20	$65.89	0.000	$4.93	$292	$312
	1,399	1,398	$160	$65.89	0.000	$4.93	$1,989	$2,148
	1,399	1,599	$0	$65.89	0.000	$4.93	$0	$0
2 Inch Meter	0	133	$18	$84.73	0.000	$4.93	$265	$283
	134	266	$18	$84.73	0.000	$4.93	$265	$283
	267	400	$18	$84.73	0.000	$4.93	$265	$283
	401	534	$18	$84.73	0.000	$4.93	$265	$283
	535	667	$18	$84.73	0.000	$4.93	$265	$283
	668	801	$18	$84.73	0.000	$4.93	$265	$283
	802	935	$18	$84.73	0.000	$4.93	$265	$283
	936	1,069	$18	$84.73	0.000	$4.93	$265	$283
	1,070	1,202	$18	$84.73	0.000	$4.93	$265	$283
	1,203	1,398	$27	$84.73	0.000	$4.93	$389	$416
	1,399	1,398	$213	$84.73	0.000	$4.93	$3,410	$3,623
	1,399	1,599	$0	$84.73	0.000	$4.93	$0	$0
3 Inch Meter (MH Park)	0	133	$5	$134.96	0.000	$4.93	$66	$71
	134	266	$5	$134.96	0.000	$4.93	$66	$71
	267	400	$5	$134.96	0.000	$4.93	$66	$71
	401	534	$5	$134.96	0.000	$4.93	$66	$71
	535	667	$5	$134.96	0.000	$4.93	$66	$71
	668	801	$5	$134.96	0.000	$4.93	$66	$71
	802	935	$5	$134.96	0.000	$4.93	$66	$71
	936	1,069	$5	$134.96	0.000	$4.93	$66	$71
	1,070	1,202	$5	$134.96	0.000	$4.93	$66	$71
	1,203	1,398	$7	$134.96	0.000	$4.93	$97	$104
	1,399	1,398	$53	$134.96	0.000	$4.93	$1,358	$1,411
	1,399	1,599	$0	$134.96	0.000	$4.93	$0	$0

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 100s	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
4 Inch Meter (Airport)	0	133	$5	$191.48	0.000	$4.93	$66	$71
	134	266	$5	$191.48	0.000	$4.93	$66	$71
	267	400	$5	$191.48	0.000	$4.93	$66	$71
	401	534	$5	$191.48	0.000	$4.93	$66	$71
	535	667	$5	$191.48	0.000	$4.93	$66	$71
	668	801	$5	$191.48	0.000	$4.93	$66	$71
	802	935	$5	$191.48	0.000	$4.93	$66	$71
	936	1,069	$5	$191.48	0.000	$4.93	$66	$71
	1,070	1,202	$5	$191.48	0.000	$4.93	$66	$71
	1,203	1,398	$7	$191.48	0.000	$4.93	$97	$104
	1,399	1,398	$53	$191.48	0.000	$4.93	$1,926	$1,980
	1,399	1,599	$0	$191.48	0.000	$4.93	$0	$0
Bulk Water	0	133	$0	$0.00	0.000	$21.02	$0	$0
	6,937	6,938	$0	$0.00	0.000	$21.02	$0	$0
Total Rate Revenue at Current Rates			$24,530	Total Rate Revenue at Modeled Rates			$268,646	
						Total Blended Rate Revenues for the Year		$293,176

Note: New Minimum Charge Base Rates: If meter size-based minimum charges are to be used, and the user classes modeled above include meter or connection sizes, the amounts shown in this column include meter size surcharges as calculated in Table 16. Either way, the narrative report includes the rates and surcharges to assess.

1.9	months at the old user charge rates	and	10.1	months at the new user charge rates.

Table 12 - Flow Capacity Costs

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

Building system capacity and connecting new customers to the system costs money. Those costs must be recovered. That can be done on the "front end" with system development fees and connection fees. It can be done later with system development surcharges to the minimum charge. It is usually most practical to use a blend of both. This table shows capacity costs. From these costs, system development fees and surcharges were developed in Tables 13 through 16.

Peak and Base Flow Capacity Costs

	Costs Related to Water Service						
Fixed Assets Original Value (Capacity Cost)	% of That Value Attributable to Regular Water Service	% Attributable to Water Peak Capacity	Peak Water Capacity Cost	Annual Water Peak Capacity Cost (40-year Depreciation)*	% of Value Attributable to Water Base Flow Capacity	Base Flow Capacity Cost for Water Service	Annual Water Base Capacity Cost (40-year Depreciation)*
$1,191,667	100.0%	50.0%	$595,833	$30,104	50.0%	$595,833	$30,104

*** It is assumed full system replacement costs will escalate each year by: 4.0%**

How Water System Capacity Costs Will Be Recovered

These costs are modeled to be recovered from minimum charge surcharges in Tables 15 and 16

Part of Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

100%	Target Percentage of Costs to Recover
$30,103.58	Target Portion of Costs to Recover in One Full Year
$2,508.63	Target Portion of Costs to Recover in Monthly Surcharges
$6.28	Monthly Surcharge per Peak Capacity Share

Table 15 - Minimum Charge Fees, Including Capacity Surcharges

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This table does, essentially, the same thing as Table 13, except costs are recovered over time as minimum charge surcharges.

Meter Size	Meter Type	Capacity Shares Each Meter Size After Adjustment	Monthly Surcharge per Peak Capacity Share (Table 11)	Peak Capacity Cost per Meter Size	Cost-to-Serve Minimum Charge From Table 10	**Monthly Minimum Charge, Including Peak Capacity**
Five Eighths	Displacement	1.0	$6.28	$6.28	$34.49	**$40.77**
Three Quarters	Displacement	1.0	$6.28	$6.28	$34.49	**$40.77**
One Inch	Displacement	2.5	$6.28	$15.70	$34.49	**$50.19**
One & a Half Inch	Displacement	5.0	$6.28	$31.40	$34.49	**$65.89**
Two Inch	Displacement	8.0	$6.28	$50.24	$34.49	**$84.73**
Two & a Half Inch	Displacement	12.5	$6.28	$78.49	$34.49	**$112.98**
Three Inch	Singlet	16.0	$6.28	$100.47	$34.49	**$134.96**
Three Inch	Compound, Class I	16.0	$6.28	$100.47	$34.49	**$134.96**
Three Inch	Turbine, Class I	17.5	$6.28	$109.89	$34.49	**$144.38**
Four Inch	Singlet	25.0	$6.28	$156.99	$34.49	**$191.48**
Four Inch	Compound, Class I	25.0	$6.28	$156.99	$34.49	**$191.48**
Four Inch	Turbine, Class I	31.0	$6.28	$194.66	$34.49	**$229.15**
Six Inch	Singlet	50.0	$6.28	$313.97	$34.49	**$348.46**

Table 16 - Revenues From Minimum Charge Surcharges
Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This table calculates total minimum charge surcharge revenues that would be generated during one full year at the fees in Table 15.

Meter Size	Meter Type	Number Meters This Size	Total Adjusted Capacity Shares	**Annual Peak Capacity Surcharge Revenues**
Five Eighths	Displacement	224	1	**$16,879**
Three Quarters	Displacement	0	1	**$0**
One Inch	Displacement	5	3	**$942**
One & a Half Inch	Displacement	3	5	**$1,130**
Two Inch	Displacement	4	8	**$2,411**
Two & a Half Inch	Displacement	0	13	**$0**
Three Inch	Singlet	1	16	**$1,206**
Three Inch	Compound, Class I	0	16	**$0**
Three Inch	Turbine, Class I	0	18	**$0**
Four Inch	Singlet	4	25	**$7,535**
Four Inch	Compound, Class I	0	25	**$0**
Four Inch	Turbine, Class I	0	31	**$0**
		241	1,963	**$30,104**
		0	2,944	**$0**
		241	4,907	**$30,104**

Table 17 - Financial Capacity Indicators and Reserves

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

This table depicts the affordability of future rates, the financial health of the system and the ending balances in various (assumed) accounts for the test year and the next 10 years.

	Capacity Indicators	Test Year Starting 1/1/22	0 Year Starting 1/1/23	1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Customary Affordability Index	Monthly Bill for a 5,000 gal per Month, Small Meter Residential Customer	$39.17	$73.73	$76.67	$79.74	$82.93	$86.25	$89.70	$93.29	$97.02	$100.90	$104.93	$109.13
	AMHI Within Service Area	$63,584	$65,860	$68,217	$70,659	$73,188	$75,807	$78,520	$81,331	$84,241	$87,257	$90,380	$93,614
	Affordability Index: Current Rates First Column, Modeled Rates After That	0.74%	1.34%	1.35%	1.35%	1.36%	1.37%	1.37%	1.38%	1.38%	1.39%	1.39%	1.40%
	National Average Affordability Index: Commonly Accepted but Not Statistically Verifiable	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the cost of 60,000 gallons of residential service per year (5,000 gallons per month) divided by the Annual Median Household Income (AMHI) in the service area (gleaned from Census data or a survey). Rates near 1.0% are common in the U.S. and are generally considered affordable. Most grant agencies will decline to award grants if the AI is less than 1.5 to 2.0%, unless other eligibility criteria considered along with the AI make an applicant eligible.												
Low-income, Low-volume "Affordability Index"	Monthly Bill for a 2,000 gal per Month, Low-income Residential Customer	$32.15	$53.95	$56.11	$58.36	$60.69	$63.12	$65.64	$68.27	$71.00	$73.84	$76.79	$79.86
	Income at One-half the AMHI and Rising at One-half the Rate Above	$31,792	$32,361	$32,940	$33,530	$34,130	$34,740	$35,362	$35,995	$36,639	$37,295	$37,962	$38,641
	Affordability for Low-income, Low-volume: Current Rates First Column, Modeled Rates After That	1.21%	2.00%	2.04%	2.09%	2.13%	2.18%	2.23%	2.28%	2.33%	2.38%	2.43%	2.48%
	This additional indicator of affordability assumes a residential customer with income at one-half the median household income above, that income is growing at one-half the rate of the median household income and the customer uses 2,000 gallons per month. Such a customer is likely either a minimum wage or near-minimum wage worker, or is retired and living only on Social Security benefits. Such customers are more commonly the "slow pays" and "no pays" compared to others, so this indicator goes to the "business sense" of the rates modeled here. In other words, raise this customer's bill too much and they are more likely to pay late or not pay.												

Table 17 - Financial Capacity Indicators and Reserves

Estimated Operating Ratio: Current Rates First Column, Modeled Rates After That	0.76	1.04	1.02	1.15	1.11	1.14	1.13	1.09	1.11	1.10	1.06	1.09

Operating ratio (OR) is a measure of the utility's ability to pay its operating expenses using only current incomes. A 1.0 OR is break even. Below 1.0 indicates operating in the "red." Generally, the OR should be at least 1.15 for large systems, 1.30 or more for medium-sized systems and perhaps as high as 2.0 for small systems. Note: If the utility has or will have reserves (below,) it has more ability to pay its operating costs than this calculation of OR implies.

Estimated Coverage Ratio: Current Rates First Column, Modeled Rates After That	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments out of current incomes. CR applies only to years with debt service. A "N.A." above indicates there was not, or in a future year there will not be debt during that year. 1.0 is break even - just enough net revenue to pay debt. Generally, the CR should be at least 1.25. Note: If the utility has or will have other available reserves (shown below,) it has more ability to make debt payments than the CR implies. That is covered by the Alternative Coverage Ratio that follows next.

Alternative Coverage Ratio: Current Rates First Column, Modeled Rates After That	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

This Alternative Coverage Ratio (ACR) is based on the same notion as the classic coverage ratio above, except it includes reserves that are available to pay debt service. With the classic CR, a utility could build reserves early on with current net revenues, but then future rates may not be high enough to show a strong CR. The classic CR could even go negative. But in reality, the utility could have quite strong reserves with which to pay debt. Thus, the Alternative Coverage Ratio can be a better indicator of a utility's true ability to pay debt.

Reserves	Balance Ending on 12/31/21	Balance Ending on 12/31/22	Balance Ending on 12/31/23	Balance Ending on 12/31/24	Balance Ending on 12/31/25	Balance Ending on 12/31/26	Balance Ending on 12/31/27	Balance Ending on 12/31/28	Balance Ending on 12/31/29	Balance Ending on 12/31/30	Balance Ending on 12/31/31	Balance Ending on 12/31/32	Balance Ending on 12/31/33
Cash and Cash Equivalents	$0	-$62,911	-$50,836	-$46,007	$529	$36,722	$81,494	$125,095	$156,676	$197,596	$237,105	$263,239	$299,544
Other Liquid Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Undedicated Cash Assets	$0	-$62,911	-$50,836	-$46,007	$529	$36,722	$81,494	$125,095	$156,676	$197,596	$237,105	$263,239	$299,544
Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power)	$0	-$62,911	-$50,836	-$47,924	$487	$32,490	$69,216	$101,999	$122,639	$148,483	$171,045	$182,302	$207,444
Repair & Replacement	$0	$0	$3,514	$7,099	-$11,742	-$8,462	-$5,117	-$1,705	$1,775	$5,325	$8,946	$12,639	$16,406
Debt and CIP Reserves	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sum of All Reserves	$0	-$62,911	-$47,322	-$38,908	-$11,213	$28,260	$76,376	$123,389	$158,451	$202,921	$246,051	$275,878	$315,950

Table 18 - Bills Before and After Rate Adjustments

Inyokern Community Services District, Inyokern, California, Water Meter-based Rates Model 2023-3

Individual bills would change as shown in the following table. Note: The actual rates to adopt or consider are included in the narrative report.

Customer, Rate Class or Meter Size	Cu Ft of Use	Customers Using This Volume or Less	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
5/8, 3/4 Inch Meter	0	0	$27.47	$40.77	$13.30	48%
	134	0	$29.81	$47.36	$17.55	59%
	267	0	$32.15	$53.95	$21.80	68%
	401	0	$34.49	$60.54	$26.05	76%
	535	0	$36.83	$67.13	$30.31	82%
	668	0	$39.17	$73.73	$34.56	88%
	802	0	$41.51	$80.32	$38.81	93%
	936	0	$43.85	$86.91	$43.06	98%
	1,070	0	$46.19	$93.50	$47.31	102%
	1,203	0	$48.53	$100.09	$51.56	106%
	1,399	224	$51.96	$109.76	$57.80	111%
	6,937	0	$158.21	$382.76	$224.55	142%
1 Inch Meter	0	0	$0.00	$50.19	$50.19	N.A.
	134	0	$9.97	$56.78	$46.81	469%
	267	0	$19.95	$63.37	$43.43	218%
	401	0	$29.92	$69.96	$40.04	134%
	535	0	$39.89	$76.55	$36.66	92%
	668	0	$49.87	$83.14	$33.28	67%
	802	0	$59.84	$89.74	$29.90	50%
	936	0	$69.81	$96.33	$26.51	38%
	1,070	0	$79.79	$102.92	$23.13	29%
	1,203	0	$89.76	$109.51	$19.75	22%
	1,399	5	$104.40	$119.18	$14.78	14%
	6,937	0	$517.49	$392.18	-$125.31	-24%

Table 18 - Bills Before and After Rate Adjustments

Customer, Rate Class or Meter Size	Cu Ft of Use	Customers Using This Volume or Less	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
1.5 Inch Meter	0	0	$27.47	$65.89	$38.42	140%
	134	0	$29.81	$72.48	$42.67	143%
	267	0	$32.15	$79.07	$46.92	146%
	401	0	$34.49	$85.66	$51.17	148%
	535	0	$36.83	$92.25	$55.42	150%
	668	0	$39.17	$98.84	$59.68	152%
	802	0	$41.51	$105.43	$63.93	154%
	936	0	$43.85	$112.02	$68.18	155%
	1,070	0	$46.19	$118.62	$72.43	157%
	1,203	0	$48.53	$125.21	$76.68	158%
	1,399	3	$51.96	$134.88	$82.92	160%
	6,937	0	$148.87	$407.88	$259.01	174%
2 Inch Meter	0	0	$27.47	$84.73	$57.26	208%
	134	0	$29.81	$91.32	$61.51	206%
	267	0	$32.15	$97.91	$65.76	205%
	401	0	$34.49	$104.50	$70.01	203%
	535	0	$36.83	$111.09	$74.26	202%
	668	0	$39.17	$117.68	$78.51	200%
	802	0	$41.51	$124.27	$82.76	199%
	936	0	$43.85	$130.86	$87.02	198%
	1,070	0	$46.19	$137.45	$91.27	198%
	1,203	0	$48.53	$144.05	$95.52	197%
	1,399	4	$51.96	$153.72	$101.76	196%
	6,937	0	$148.87	$426.72	$277.85	187%

Table 18 - Bills Before and After Rate Adjustments

Customer, Rate Class or Meter Size	Cu Ft of Use	Customers Using This Volume or Less	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
3 Inch Meter (MH Park)	0	0	$27.47	$134.96	$107.49	391%
	134	0	$29.81	$141.55	$111.74	375%
	267	0	$32.15	$148.14	$116.00	361%
	401	0	$34.49	$154.74	$120.25	349%
	535	0	$36.83	$161.33	$124.50	338%
	668	0	$39.17	$167.92	$128.75	329%
	802	0	$41.51	$174.51	$133.00	320%
	936	0	$43.85	$181.10	$137.25	313%
	1,070	0	$46.19	$187.69	$141.50	306%
	1,203	0	$48.53	$194.28	$145.75	300%
	1,399	1	$51.96	$203.96	$152.00	293%
	6,937	0	$148.87	$476.95	$328.09	220%
4 Inch Meter (Airport)	0	0	$27.47	$191.48	$164.01	597%
	134	0	$29.81	$198.07	$168.26	564%
	267	0	$32.15	$204.66	$172.51	537%
	401	0	$34.49	$211.25	$176.76	513%
	535	0	$36.83	$217.84	$181.01	492%
	668	0	$39.17	$224.43	$185.26	473%
	802	0	$41.51	$231.02	$189.52	457%
	936	0	$43.85	$237.61	$193.77	442%
	1,070	0	$46.19	$244.20	$198.02	429%
	1,203	0	$48.53	$250.80	$202.27	417%
	1,399	1	$51.96	$260.47	$208.51	401%
	6,937	0	$148.87	$533.47	$384.60	258%

Chart 3 - Residential Users' Bills

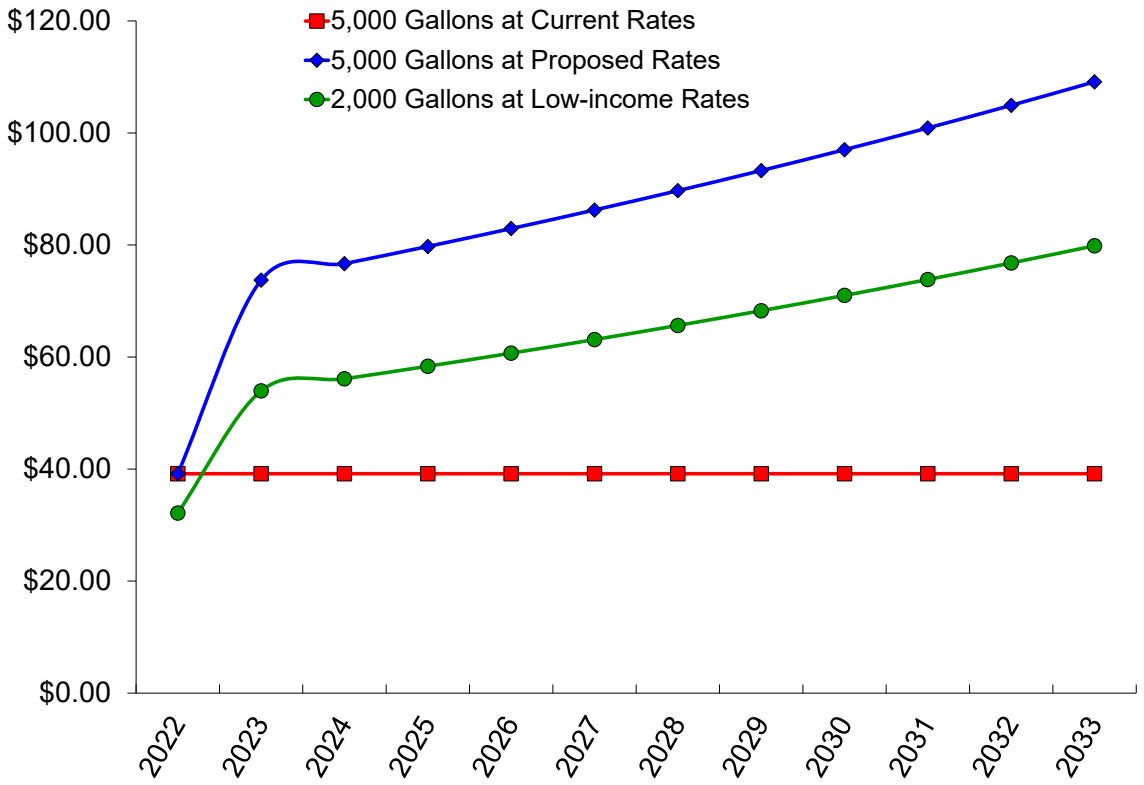

Chart 4 - Affordability