



Supplemental Appendix E Future socioeconomic indicator considerations for SSWSs and DWs

September 2022

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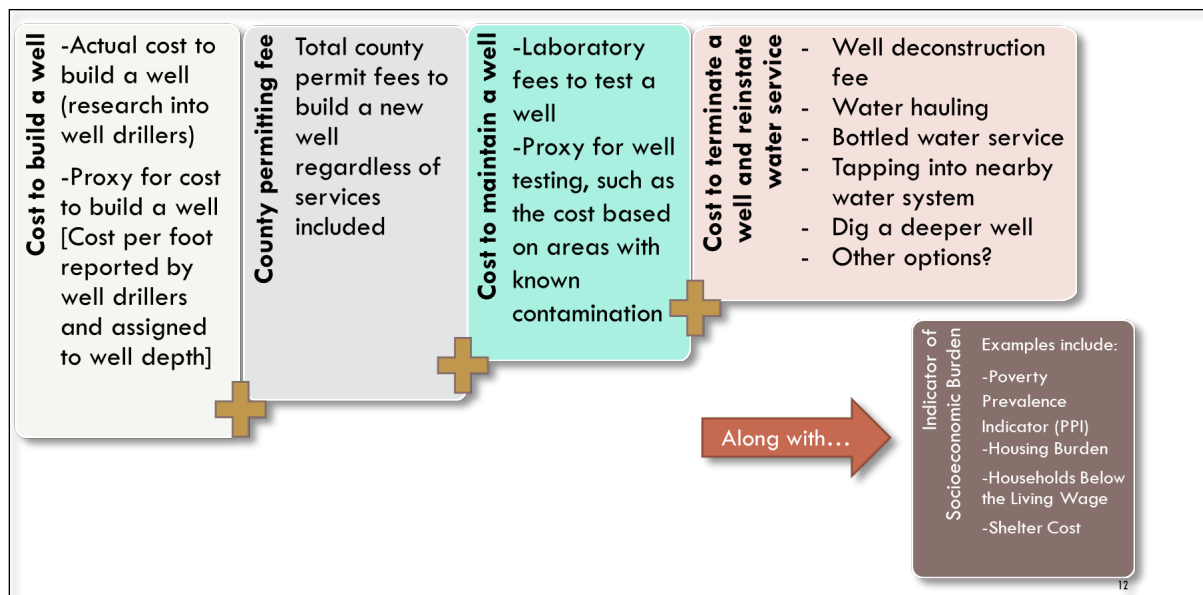
Future socioeconomic indicator considerations for SSWs and DWs

Assessing socioeconomic vulnerability for State Small Water Systems (SSWs) and domestic well (DW) users is important because drinking water well infrastructure must be maintained and replaced over time. The ability for a property or household to maintain a well over time impacts their ability to have access to safe drinking water.

Water cost, maintenance, and socioeconomic information is necessary to assess drinking water affordability for SSWs and DWs in California. SSWs and DWs do not incur service charges the same way community water systems (CWSs) do. However, as data is collected and understood better, in the future, permitting costs, well building costs and well maintenance costs could be used similarly as a water service charge would be for CWSs.

The future for understanding affordability for DW users may look like Figure 1, where the various levels of cost and maintenance of a well are summed in relation to the socioeconomic burden of an area. Until state departments are able to get a firm handle on the cost to build and maintain a well, indicators of socioeconomic burden will help in understanding the ability to pay in areas across California. OEHHA recommends poverty and housing cost burden because both account for poorer households within communities and housing cost burden accounts for housing and utility cost in relation to the varying levels of income across California. Here, we discuss possibilities and work conducted in cost assessment for domestic well users. These cost metrics may be combined with socio-economic indicators to create a more robust affordability assessment for domestic well users.

Figure 1: A possible model for the future of domestic well affordability



Summary of Initial County Domestic Well Research

Despite the permitting fees charged for domestic well construction, counties may provide a wide range of administrative, financial, well-building, etc. services. When understanding cost, an important caveat is to consider the services provided. Information such as domestic well design standards, well permitting requirements, water quality sampling, administrative services and financial assistance for domestic well users were researched through county websites and compiled. Some initial findings are described below. It is important to note that this data collection effort represents a snapshot of time and therefore, this information would need to be re-assessed for accuracy in the future.

1. **If the county has domestic well design standards** (such as minimum depth, sealing materials), and any details provided on the county's environmental health or public health websites.
 - 35 counties had explicit domestic well design standards listed on their websites.
 - The other 23 counties may have design standards, but they were not found through our internet research.
2. **If the county has domestic well permitting requirements** (steps to receive permit)
 - 52 counties had county-specific permitting requirements
 - 27 counties require water quality (WQ) sample for permit.
 - The other six counties may have permitting requirements, but they were not found through our internet research.
3. **If the county requires domestic well owners to take a water quality sample before a permit is granted.**
 - 15 counties require a WQ sample to be taken before the permit is granted.
 - 11 counties require a WQ sample to be taken after the permit is granted.
 - One county does not clearly state when the WQ sample must be taken.
 - 21 counties require the WQ samples to be reported to an entity within the county, such as the health officer or in certain cases, the Drinking Water Protection Services Program.
4. **If the county requires a well completion form to be filed.**
 - 31 counties explicitly state on their website that well reports need to be reported to the county within 30, 60 or 90 days of completion
 - Two counties do not require reports to be filed with the county, but do require the certified well driller to upload the well completion report directly to the Online System of Well Completion Reports (OSWCR)
 - One county does not require reports to be filed with the county but does require the certified well driller to send the well completion report to DWR.
 - One county does not require the well completion reports to be reported to the county, it appears optional.
 - 35 counties had no information on well completion reports listed on their websites.

5. **If the county requires ongoing WQ testing**, after the initial test(s) or after the permit is granted.
 - No counties required ongoing testing, but a few counties strongly recommend ongoing testing, and some counties will require ongoing testing if a MCL has been violated in the initial test or other optional tests.
6. **If the county has a domestic well water quality program.**
 - Six counties have some form of a domestic well water quality monitoring program. Details of the county monitoring program are available on the spreadsheet.
7. **If the county has specific requirements for water quantity, or well production.**
 - 13 counties require some sort of water quantity testing, such as well yield tests.
 - **If the county has any administrative services** such as lists of well drilling contractors, lists of laboratories for well sampling, or where to report a dry or failing well.
 - 39 counties offered some type of administrative service, with the most common service being providing a list of approved drillers or laboratories on their website.
 - The other 19 counties may offer administrative services, but they were not found through our internet research.
8. **If the county has financial services for domestic wells.**
 - Examples of financial services that are offered to domestic well users include fee waivers, water containers for distribution for those served by dry wells, free well testing, or bottled water services for dry or contaminated wells.
 - Six counties had some sort of financial services for domestic well users.

Cost to Build a Well

Well depth needed to drill, and the size and material of casing, have a direct relationship with drilling costs.^{1,2} Other cost factors include the following:

- PVC is less expensive, stainless steel is more expensive
- Cost increases as the diameter of well increases (wells range from 4" to 6" in diameter)
- Building a well in alluvial rock is more expensive than groundwater basins
- Minimum and a maximum well-depth by section, township, block group, groundwater unit, or census tract can be ascertained, offering a potential proxy for well cost.
- Costs increase as the well depth increases.

¹ <http://cvfpub.ca.gov/wp-content/uploads/2020/11/8b.-EIS-Attachment-Well-Drilling-Costs.pdf>

² <https://homeguide.com/costs/well-drilling-cost>

- Costs increase as the potential need to deconstruct a well based on low groundwater levels increases.

Table 1: Example of researching into a drilling company in the Central Valley:

County	Min cost per foot	Max cost per foot
San Joaquin County	\$40	\$60
Stanislaus	\$40	\$60
Merced	\$40	\$60

If the min well depth is 100 ft and the max is 400 ft in a block group, then the well cost could be assumed to be \$4,000 to \$24,000 based on the rates shown above. An average well depth and average cost per foot could be used to simplify these metrics for a given geography.

County Permitting Costs

Information on California domestic well permits and associated fees were collected by calling county domestic well permitting agencies and speaking on the phone with environmental health specialists, department directors, and permit fee specialists. Most counties increase fees only at the beginning of the fiscal year (July 1). Thus, these fees are only accurate for the 2021-2022 fiscal year. The survey questions that were asked of county officials is shown in Table 2.

Table 2: Survey questions asked to county employees for permit fee data collection

Question #	Question
Q1.	I want to drill a new well and destroy an existing well on my property, what fees do I need to pay?
Q2.	I want to deepen an existing well on my property, what fees do I need to pay?
Q3.	I want to add a second active well on my property, what fees do I need to pay?
Q4.	Is the cost for inspection included or separate from the cost of the permit?
Q5.	How long do permits last for, and is there a cost associated with renewing a permit?
Q6.	Is initial water sampling required by your county to receive a permit?
Q7.	Is ongoing water quality testing required to be reported to the county?
Q8.	Are costs for water quality sampling paid by the owner to the county or to an outside laboratory?
Q9.	Are there any zone surcharges in your county where permits would be more expensive?
Q10.	Are there any other fees or permits you think are important for me to note down?

Permitting Fees Based on Three Scenarios

The county representative was asked the cost of permitting if a homeowner wanted to do any of the following three scenarios. The total cost for each scenario could be used in a future indicator measuring affordability for domestic well users. The fees for each scenario by county are reported in Table 3. Data are missing for three counties because these counties had no relevant permits listed online and they were unable to be reached by phone.

First scenario: Building a replacement well

This is the most common solution for when an existing well goes dry. Some counties require a water yield test, such as Los Angeles, Contra Costa, Madera (within city limits), Mendocino, and Santa Clara.

Second Scenario: Deepening an existing well

This is the second most common solution to a dry well. Well deepening and well reconstruction are essentially the same permits. Some counties include deepening in well repair or well modification permits. Deepening wells is very uncommon in some counties such as Marin, Merced, Kern, Madera, Sutter, and Kings. San Mateo and Del Norte counties noted they do not recommend well deepening.

Third Scenario: Building a second well

This was the most uncommon solution to a well going dry. Most counties do not have a limit on how many domestic wells can be on a parcel or serve a household – if the well abides by code restrictions the property owner is allowed to build another well (with some exceptions). Ventura County representatives mentioned they may need to get approval from the Groundwater Management Agency in their area. Los Angeles County representatives mentioned they may need approval from the Watermaster in certain areas. Glenn County has a well drilling moratorium so if someone wants to build a second well, they need to destroy the old one first.

Table 3: List of all counties’ permitting fees for the three scenarios, ranked by highest replacement well cost.

County	Replacement Well	Deepen Well	Second Well
San Mateo	\$5,939	\$1,634	\$5,111
Monterey	\$4,344	\$1,808	\$3,113
Imperial	\$3,776	\$461	\$3,761
Los Angeles	\$3,209	\$2,239	\$1,941

County	Replacement Well	Deepen Well	Second Well
Santa Clara	\$3,034	\$230	\$3,034
Marin	\$2,846	\$1,279	\$2,131
Santa Cruz	\$2,441	\$2,038	\$2,038
Kern	\$2,320	\$1,160	\$1,160
Ventura	\$1,535	\$430	\$1,355
Santa Barbara	\$1,482	\$721	\$721
Placer	\$1,450	\$255	\$932
Contra Costa	\$1,383	\$1,383	\$1,383
San Benito	\$1,348	\$840	\$840
Yolo	\$1,322	\$835	\$985
Tuolumne	\$1,298.25	\$398	\$900.25
Fresno	\$1,287	\$769	\$769
San Luis Obispo	\$1,196	\$932	\$932
Nevada	\$1,086	\$201	\$592
Sacramento	\$1,086	\$440	\$1,086
Sutter	\$1,062	\$590	\$590
Sonoma	\$987	\$502	\$700
San Diego	\$970	\$633	\$633
Madera	\$969	\$374	\$674
San Joaquin	\$966	\$429	\$814

County	Replacement Well	Deepen Well	Second Well
Calaveras	\$935	\$312	\$623
San Bernardino	\$906	\$293	\$845
Merced	\$894	\$221	\$836
Yuba	\$857.01	\$155.82	\$467.46
Alameda	\$794	\$397	\$397
Mendocino	\$772	Missing	\$502
El Dorado	\$771	\$86	\$514
Sierra	\$747	\$428	\$519
Orange	\$738	\$623	\$623
Riverside	\$719	\$528	\$528
Plumas	\$681	\$134	\$514
Shasta	\$650	\$145	\$506
Mono	\$648	\$162	\$648
Napa	\$629	\$424	\$529
Stanislaus	\$615	\$123	\$615
Butte	\$593	\$237	\$593
Glenn	\$566	\$288	\$453
Kings	\$550	\$550	\$550
Siskiyou	\$545	\$185	\$360
Colusa	\$532	\$224	\$364

County	Replacement Well	Deepen Well	Second Well
Humboldt	\$522	\$149	\$373
Alpine	\$512	\$137	\$410
Inyo	\$512	\$88	\$424
Amador	\$450	\$150	\$300
Tulare	\$447	\$447	\$314
Lake	\$422	\$103	\$319
Lassen	\$399	\$170	\$254
Mariposa	\$248	\$199	\$248
Tehama	\$241	\$320	\$241
Trinity	\$240	Missing	Missing
Solano	\$184	\$297	\$706
Del Norte	\$150	\$150	\$150
Modoc	\$90	\$90	\$90
San Francisco	Missing	Missing	Missing

Other information surveyed to counties

Inspections

Inspections are required by all counties and are included in the cost of the permit. For example, county well inspectors may check the well location, conduct a seal inspection, conduct a pad inspection, and/or be present during construction. Permit costs usually assume a certain amount of inspector labor hours (i.e., 3 hours to complete an inspection is included in the permit cost). If an inspection or other work goes over the allotted amount of time on a permit, the permit applicant will be charged an additional fee (usually hourly) to complete cost-recovery.

Permit Renewal

Most permits are valid for between 0.5 to 1.5 years, depending on the permit and the County. If a permit needs to be renewed it may be free in some counties or have a permit renewal cost, or the homeowner will just need to completely re-apply and thus re-pay for the permit.

Water Quality Testing

Water quality testing is usually required when a new home is being built on a property and a domestic well will be used to serve that new property. If a domestic well is being installed on a property that already has a building on it, complete water quality testing may not be required. Most counties do not require water quality sampling for a domestic well permit to be considered finalized. Most counties do not offer water quality testing services through the county and even fewer include water quality testing in the permit fee itself. Merced County, Riverside County, San Joaquin County and Santa Clara County require water quality testing and include the cost of testing in the cost of the permit. Fresno County does not require testing, but the cost is still included in the permit. Marin County, Monterey County, San Mateo County, Merced County, Los Angeles County, Placer County, San Luis Obispo County, Yolo County, Tuolumne County, Kern County, Mono County, Santa Cruz County, Alpine County, Alameda County, Amador County, Calaveras County, Sierra County, San Bernardino County, and San Joaquin County require initial water quality sampling to finalize a permit but do not include water quality testing services in the cost of the permit. For those counties that do require initial testing but do not include the cost of testing in the permit, some domestic well users can pay the county to come complete testing, but the majority must pay a private laboratory. Some counties only require initial testing in certain parts of the county (e.g., Siskiyou County). No counties require continued domestic well testing after construction. If a domestic well owner wishes to complete water quality testing, that is their choice and they will pay an outside laboratory.

A few counties had more complex permitting fees and are listed here.

- Monterey County has a complex process for permitting and fees. Monterey was the only county to have a California Environmental Quality Act (CEQA) review fee that is applied to all well permits. Monterey County also had different fees according to which zone the well is in – outside or inside the coastal zone.
- San Mateo County also had a coastal zone drilling fee and mentioned that the relevant city planning departments would issue a CEQA fee which varies by city.
- Tulare and Madera County had slightly different permit fees for wells drilled inside city limits and outside city limits.
- Butte, Del Norte, and Mariposa offer water quality testing services through the county but do not require water quality sampling.

Cost to Maintain a Well

OEHHA did not conduct an official analysis to determine cost of maintaining a well. However, preliminary online research shows various costs treatment for well contamination³. Future efforts can confirm these various costs. Analyses comparing areas of known contamination to treatment costs may help understand variation across California in cost burden due to maintaining a well.

Cost to Terminate a Well, Reinstate Water Service

When homeowners are left with no option but to terminate a well, possible costs for various responses to the termination include the following.

- Well deconstruction permit fee (discussed above)
- Cost for water hauling
- Cost for bottled water service
- Cost for tapping into nearby water system
- Cost to dig a well deeper

The average cost to redrill a well deeper is \$3,000 to \$6,000, or between \$35 and \$84 per foot.

³ [A Guide for Private Domestic Well Owners.](https://www.waterboards.ca.gov/gama/docs/wellowner_guide.pdf)
https://www.waterboards.ca.gov/gama/docs/wellowner_guide.pdf