



**MARIN COUNTY
LOCAL AGENCY FORMATION COMMISSION**

Regional Service Planning / Subdivision of the State of California

COUNTYWIDE WATER SERVICE STUDY

Municipal Service Review / Government Code Section 56430

Affected Governmental Agencies

Bolinas Community Public Utility District
Inverness Public Utility District
Marin Municipal Water District
Muir Beach Community Services District
North Marin Water District
- Novato and Point Reyes Station
Stinson Beach County Water District

**Final Report /
Pending Commission Action**

December 2015

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LAFCO decisions are legislative in nature and therefore are not subject to an outside appeal process. LAFCOs also have broad powers with respect to conditioning regulatory and planning approvals so long as not establishing any terms that directly control land uses, densities, or subdivision requirements.

B. Regulatory Responsibilities

LAFCOs' principal regulatory responsibility involves approving or disapproving all jurisdictional changes involving the establishment, expansion, and reorganization of cities and most special districts in California.³ More recently LAFCOs have been tasked with also overseeing the approval process for cities and districts to provide

LAFCOs have been responsible since 1963 to oversee formation, expansion, reorganization, and dissolution actions involving cities and special districts in California with limited exceptions.

new or extended services beyond their jurisdictional boundaries by contract or agreement as well as district actions to either activate a new service or divest an existing service. LAFCOs generally exercise their regulatory authority in response to applications submitted by the affected agencies, landowners, or registered voters. Recent amendments to CKH, however, now authorize and encourage LAFCOs to initiate on their own jurisdictional changes to form, consolidate, and dissolve special districts consistent with current and future community needs. The following table provides a complete list of LAFCOs' regulatory authority as of January 1, 2015.

LAFCOs' Regulatory Powers

- City Incorporations / Disincorporations
- District Formations / Dissolutions
- City and District Consolidations
- City and District Outside Service Extensions
- City and District Annexations
- City and District Detachments
- Merge/Establish Subsidiary Districts
- District Service Activations / Divestitures

C. Planning Responsibilities

LAFCOs inform their regulatory actions through two central planning responsibilities: (a) making sphere of influence ("sphere") determinations and (b) preparing municipal service reviews. Sphere determinations have been a core planning function of LAFCOs since 1971 and effectively serve as the Legislature's version of "urban growth boundaries" with regard to cumulatively

LAFCOs are tasked with planning the location of future urban development and services through two interrelated activities: (a) establish and update spheres of influence and (b) prepare municipal service reviews to independently evaluate the availability and performance of governmental services relative to need.

³ CKH defines "special district" to mean any agency of the State formed pursuant to general law or special act for the local performance of governmental or proprietary functions within limited boundaries. All special districts in California are subject to LAFCO with the following exceptions: school districts; community college districts; assessment districts; improvement districts; community facilities districts; and air pollution control districts.

delineating the appropriate interface between urban and non-urban uses within each county. Municipal service reviews, in contrast, are a relatively new planning responsibility enacted as part of CKH and are intended to inform – among other activities – sphere determinations. The Legislature mandates, notably, all sphere changes as of 2001 be accompanied by preceding municipal service reviews to help ensure LAFCOs are effectively aligning governmental services with current and anticipated community needs. An expanded summary of the function and role of these two planning responsibilities follows.

Sphere of Influence Determinations

LAFCOs establish, amend, and update spheres for all cities and most special districts in California to designate the territory it independently believes represents the appropriate and probable future service area and jurisdictional boundary of the affected agency. Importantly, all jurisdictional changes, such as annexations and detachments, must be consistent with the spheres of the affected local agencies with limited exceptions.⁴ Further, an increasingly important role involving sphere determinations relates to their use by regional councils of governments as planning areas in allocating housing need assignments for counties and cities, which must be addressed by the agencies in their housing elements.

Spheres serve as the Legislature's version of urban growth boundaries and – among other items – delineate where cities or districts may seek future annexation and outside service approvals with LAFCOs. All jurisdictional changes must be consistent with the affected agencies spheres with limited exceptions.

As of January 1, 2008, LAFCO must review and update as needed each local agency's sphere every five years. In making a sphere determination, LAFCO is required to prepare written statements addressing five specific planning factors listed under G.C. Section 56425. These mandatory factors range from evaluating current and future land uses to the existence of pertinent communities of interest. The intent in preparing the written statements is to orient LAFCO in addressing the core principles underlying the sensible development of each local agency consistent with the anticipated needs of the affected community. The five mandated planning factors are summarized in the following table.

⁴ Exceptions in which jurisdictional boundary changes do not require consistency with the affected agencies' spheres include annexations of State correctional facilities or annexations to cities involving city owned lands used for municipal purposes with the latter requiring automatic detachment if sold to a private interest.

Mandatory Determinations / Spheres of Influence (Government Code Section 56425)

1. Present and planned land uses in the area, including agricultural and open space.
2. Present and probable need for public facilities and services in the area.
3. Present capacity of public facilities and adequacy of public services the agency provides or is authorized to provide.
4. Existence of any social or economic communities of interest in the area if the commission determines they are relevant to the agency.
5. If the city or district provides water, sewer, or fire, the present and probable need for those services of any disadvantaged unincorporated communities within the existing sphere.

Municipal Service Reviews

Municipal service reviews were a centerpiece to CKH's enactment in 2001 and are comprehensive studies of the availability, range, and performance of governmental services provided within a defined geographic area. LAFCOs generally prepare municipal service reviews to explicitly inform subsequent sphere determinations. LAFCOs also prepare municipal service reviews irrespective of making any specific sphere determinations in order to obtain and furnish information to contribute to the overall orderly development of local communities. Municipal service reviews vary in

Municipal service reviews serve to fulfill the Legislature's interests in LAFCOs regularly assessing the adequacy and performance of local governmental services in order to inform possible future actions ranging from sphere determinations to reorganizations.

scope and can focus on a particular agency or governmental service. LAFCOs may use the information generated from municipal service reviews to initiate other actions under their authority, such as forming, consolidating, or dissolving one or more local agencies. Advisory guidelines on the preparation of municipal service reviews was published by the Governor's Office of Planning and Research in 2003 and remain the lone statewide document advising LAFCOs in fulfilling this mandate.

All municipal service reviews – regardless of their intended purpose – culminate with LAFCOs preparing written statements addressing seven specific service factors listed under G.C. Section 56430. This includes, most notably, infrastructure needs or deficiencies, growth and population trends, and financial standing. The seven mandated service factors are summarized in the following table.

Mandatory Determinations / Municipal Service Reviews (Government Code Section 56430)

1. Growth and population projections for the affected area.
2. Location and characteristics of any disadvantaged unincorporated communities within or contiguous to affected spheres of influence.⁵
3. Present and planned capacity of public facilities, adequacy of public services, and infrastructure needs or deficiencies.
4. Financial ability of agencies to provide services.
5. Status and opportunities for shared facilities.
6. Accountability for community service needs, including structure and operational efficiencies.
7. Matters relating to effective or efficient service delivery as required by LAFCO policy.

D. LAFCO Composition / Direction on Decision-Making

LAFCOs are generally governed by 11-member board comprising three county supervisors, three city councilmembers, three independent special district members, and two representatives of the general public.⁶ Members are divided between “regulars” and “alternates” and must exercise their independent judgment on behalf of the interests of residents, landowners, and the public as a whole.

State law directs all LAFCO members to independently discharge their responsibilities for the good of the region and irrespective of the interests of their local appointing authorities.

LAFCO members are subject to standard disclosure requirements and must file annual statements of economic interests. LAFCOs have sole authority in administering its legislative responsibilities and its decisions are not subject to an outside appeal process. All LAFCOs are independent of local government with the majority employing their own staff; an increasingly smaller portion of LAFCOs, however, choose to contract with their local county government for staff support services. All LAFCOs, nevertheless, must appoint their own Executive Officers to manage agency activities and provide written recommendations on all regulatory and planning actions before the membership. All LAFCOs must also appoint their own legal counsel.

⁵ This determination was added to the municipal service review process by Senate Bill 244 effective January 1, 2012. The definition of “disadvantaged unincorporated community” is defined under G.C. Section 56330.5 to mean inhabited territory that constitutes all or a portion of an area with an annual median household income that is less than 80 percent of the statewide annual median household income; the latter amount currently totaling \$60,190.

⁶ Approximately two-fifths of LAFCOs in California currently operate without special district representation based on local conditions. A limited number of LAFCOs also have additional seats through special legislation.

E. Prescriptive Funding

As part of the original negotiations between the State and local agencies in establishing LAFCOs in 1963 and later updated in 2001 CKH prescribes local agencies fund LAFCOs’ annual operating costs. Counties are generally responsible for funding one-third of LAFCO’s annual operating costs with the remainder one-third portions allocated to the cities and independent special districts. The allocations to cities and special districts are calculated based on standard formula using general tax revenues unless an alternative formula has been approved by a majority of the local agencies. LAFCOs are also authorized to collect applicant fees to offset local agency contributions.

1.2 MARIN LAFCO

A. Adopted Policies and Procedures / Sphere Updates and Municipal Service Reviews

The majority of Marin LAFCO’s (“Commission”) existing policies and procedures were updated and or established in 2001 in step with the enactment of CKH. These policies and procedures collectively guide the Commission in implementing LAFCO law in Marin County in a manner consistent with regional growth management priorities as determined by the membership. This includes overarching policies and procedures to direct existing and new urban uses towards city-centers along the State Highway 101 corridor and maintaining restrictive allowances for the potential development and use therein of agricultural and open-space lands. The Commission has also established pertinent policies and procedures specific to preparing sphere updates and municipal service reviews. These latter policies are anchored on directing staff to present annual recommendations on new sphere updates and their associated municipal service reviews every year with proposed scopes of work for Commission approval.

B. Commission Roster

The Commission’s current membership is provided below.

Current Members

Name	Position	Agency Affiliation
Jeffry Blanchfield, Chair	Public	Commission
Carla Condon, Vice Chair	City	Town of Corte Madera
Judy Arnold	County	County of Marin
Jack Baker	Special District	North Marin Water
Damon Connolly	County	County of Marin
Craig K. Murray	Special District	Las Gallinas Valley Sanitary
Gary O. Phillips	City	City of San Rafael
Christopher Burdick	Public Alternate	Commission
Lew Kious	Special District Alternate	Almonte Sanitary
Kate Sears	County Alternate	County of Marin
Herb Weiner	City Alternate	City of Sausalito

C. Contact Information

Marin LAFCO's administrative office is located at 555 Northgate Drive, Suite 230 in San Rafael (Northgate). Visitor parking is available on Northgate Drive. LAFCO is a small governmental agency and as a result the office is sometimes closed during normal business hours when staff is in the field. Accordingly, appointments to discuss proposals or other matters are strongly encouraged and can be scheduled by calling 415-446-4409. Communication by e-mail is also welcome and general questions or comments should be directed to staff@marinlafco.org. General information regarding Marin LAFCO's functions and activities – including applications for boundary changes – is available by visiting www.marinlafco.org.

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CHAPTER TWO EXECUTIVE SUMMARY

2.1 OVERVIEW

A. Study Purpose

This study represents Marin LAFCO’s scheduled countywide municipal service review on water service that has been prepared by staff and consistent with the scope of work approved by the Commission. The underlying aim of the study is to produce an independent assessment of public water service in Marin County over the next five to ten years relative to the Commission’s regional growth management duties and responsibilities with particular focus on *potable* retail services (emphasis). This includes evaluating the current and future relationship between supply and demand countywide and within the service areas of the six affected agencies subject to the Commission’s oversight. Information generated as part of the study will be directly used by the Commission in (a) guiding subsequent sphere of influence updates, (b) informing future boundary changes, and – if merited – (c) initiating government reorganizations, such as special district formations, consolidations, and/or dissolutions.

The underlying purpose of the study is to independently assess the relationship and influencing factors therein between countywide potable water supplies and demands relative to the Commission’s regional growth management duties under State law. Information generated in the study will (a) guide subsequent sphere updates, (b) inform future boundary changes, and (c) if merited serve as the source document to initiate a government reorganization.

B. Key Assumptions and Benchmarks

The study has been oriented in scope and content to serve as an ongoing monitoring program on potable water services in Marin County. It is expected the Commission will revisit the study and key assumptions and benchmarks therein every five years consistent with the timetable set by the Legislature. This will also allow the Commission – among other items – to assess the accuracy of earlier projections and make appropriate changes in assumptions and benchmarks as needed as part of future reviews. Key assumptions and benchmarks affecting this study’s scope and content follow.

Setting the Study’s Timeframe

The timeframe for the study has been oriented to cover the next five to ten period with the latter (five years) serving as the analysis anchor as contemplated under State law. Markedly, this timeframe is consistent with the five-year legislative cycle legislatively prescribed for municipal service reviews under G.C. Section 56430 while

providing the Commission flexibility in scheduling its next review on potable water services in alignment with resources and priorities.⁷

Determining the Data Collection Range or Study Period

The period for collecting data to inform the Commission’s analysis and related projections on growth, demands, and finances has been set to cover the five-year period from 2009 to 2013. This data collection period – which covers the 60 months immediately preceding the start of work on the study – purposefully aligns with the five-year timeline for the study with the resulting data trends appearing most relevant to the Commission in making near-term projections (i.e., data from the last five years is most pertinent to project trends over the next five to ten years).

Calculating Population Estimates

Residential population calculations in the study have been independently made by Commission for both past and near-term future projections within all seven affected service areas. Past population projections for the service areas are based on applying a region specific person-per-household amount for every residential connection of 2.8 in West Marin and 3.3 in East Marin; a method that serves as a hybrid of the population calculation contemplated for community water systems under State law. Near-term projections have been similarly calculated for the next five to ten year period based on applying forward the estimated growth trend in each service area over the last five year period with limited exceptions (i.e., population growth between the last five years is expected to hold over the next five to ten years.)

Distinguishing Residency Types

The study distinguishes between (a) fulltime or owner-occupied households versus (b) part-time or non-owner occupied households in step with calculating population calculations; the latter category being particular relevant to the West Marin’s service areas given the influence of seasonal demands. This calculation has been independently made by the Commission and based on taking the total number of housing units assigned to all developed residential lots within each agency’s service area(s) and developing a percentage of those associated units with local ownership addresses versus those with non-local mailing addresses. The resulting percentages have been applied to the separately calculated population totals for each service areas as described above to produce residency type projections.

⁷ Incorporating projections 10 years out also allows the Commission to proceed with an applicant request for a sphere of influence amendment involving one of the affected agencies within the time period without the concurrent need for a new stand-alone municipal service review unless otherwise desired by the membership.

Making Growth Projections at Buildout

The study includes a cursory review of population and housing totals at buildout for purposes of telegraphing long-term growth as it relates to both population and housing units within each affected agency's service area(s). Housing unit projections at buildout are based on a review of all 12 land use authorities existing housing elements and specific to zoning within existing jurisdictional boundaries.⁸ Population projection totals at buildout are similarly based on applying a region-specific person-per-house amount for every projected housing unit divided between 2.8 and 3.3 in the West Marin and East Marin service areas, respectively.

Quantifying Water Supplies

The study quantifies available water supplies for all six affected agencies and within their seven respective service areas under two distinct planning conditions: (a) normal and (b) single dry-year drought. The study further quantifies water supplies under both planning conditions between daily and annual allowances with the former being particularly pertinent to matching up with peak-day demands. Specific methods and rationales made in quantifying water supplies follows.

- Quantifying supplies under normal conditions is prefaced on reviewing each agency's registered rights and/or permits with the State Water Resources Control Board (surface and underflow) coupled with incorporating other groundwater and contracted sources. Infrastructure constraints – such as pumps and pipelines – are subsequently considered in developing maximum accessible supplies under “normal” conditions for all seven service areas.
- Water supplies under single dry-year conditions – which provides a baseline reliability standard to assess system capacities – are derived from one of two sources. The first and preferred source derives from using the agencies' own calculations if performed; the latter of which applies in this study to only the two East Marin service areas. All other agencies' single dry-year supplies for the remaining five service areas in West Marin have been calculated by the Commission and consistent with methods established by the State Department of Water Resources to reflect 1976-1977 conditions.

Focus on Overall Production

The study and its analysis focuses on overall water production generated within each affected agency's service area(s), and as such incorporates demands for both metered and non-metered uses. This broader focus provides a more accurate account of actual system demands now and going forward given the inherent occurrence of water losses and line flushing.

⁸ Buildout estimates do not take into consideration future changes in boundaries as well as outside service commitments.

Calculating Future Water Demands

Future near-term water demands have been calculated in the study through 2023 within each affected agency's service area(s) based on overall production trends that occurred in the preceding five-year period between 2009 and 2013. These projections – and at the request of the affected agencies in reviewing initial administrative drafts – have been generated using linear regression to *control* for large variances in the recent five-year totals (emphasis). Additionally, extreme production anomalies were also considered on a case-by-case basis and in one instance resulted in an agency's projections being calculated using only four years of prior annual demand totals due to excessive system flushing in 2013 (BCPUD).

Benchmarking Infrastructure Needs and Deficiencies

The study focuses on each affected agency's ability to meet their maximum day demands (i.e., highest single day water use during the year) within their service area in assessing the adequacy of supply, treatment, and storage. Additionally, and to control for variances, the study uses the composite maximum day demand averaged within each service area between 2009 and 2013. These benchmarks are consistent with the State's adopted waterwork standards that requires all public water systems have source (supply and treatment) and storage capacities to meet their maximum day demands as a whole as well as in each pressure zone.⁹

Benchmarking Financial Solvency

Three diagnostic tools are used in the study to assess and make related determinations on each affected agency's financial solvency based on a five-year review of audited statements from 2009 to 2013. These diagnostic tools – (a) current ratio, (b) debt-to-net assets, and (c) operating margin – collectively provide the Commission with reasonable benchmarks to evaluate liquidity, capital, and margin and calculated to track both five-year trends as well as final year standing.

Benchmarking Pension Obligations

Three diagnostic tools are used in the study to assess and make related determinations on the strength of the pension obligations for the five affected agencies that provide employees with defined retirement benefits; all of whom have contracts with the California Public Employees Retirement System (CalPERS).¹⁰ These diagnostic tools – (a) funded ratio, (b) unfunded liability, and (c) active-to-retiree ratio – have been calculated by the Commission based on the three most recent pension statements issued by CalPERS covering 2011 to 2013. (Earlier data is not readily accessible at this time.) Further key benchmarks herein include tabbing 80% as the minimum threshold for an adequate funded ratio.

⁹ Reference to Public Resources Code Section 64554.

¹⁰ Only MBCSD does not have retiree obligations with respect to pension benefits.

C. Study Organization

This chapter serves as the Executive Summary and outlines the key conclusions and findings generated within the study. This includes addressing the mandatory service and governance factors required by the Legislature anytime the Commission performs a municipal service review. The Executive Summary is preceded by a review of key countywide service characteristics (Chapter Three) underlying potable water services. This includes providing regional and agency comparisons with respect to demographics, supplies, demands, and costs now and going forward. The third and final section involves individual agency profiles (Chapter Four) of all six affected public service providers responsible for providing retail potable water under the Commission’s jurisdiction in Marin County. These profiles transition between narrative descriptions of the historical background and development of these agencies’ service areas to quantifying specific data-driven categories, such as population and growth trends, water service capacities, and financial standing. Supplemental information on recycled water supplies, private water service providers, and watersheds is provided as appendices.

D. Affected Public Agencies

The study examines the services provided by the six public agencies directly providing retail potable water services in Marin County. These six affected agencies are divided by region and listed below.

West Marin Agencies	East Marin Agencies
Bolinas Community Public Utility District (BCPUD)	Marin Municipal Water District (MMWD) *
Inverness Public Utility District (IPUD)	North Marin Water District (NMWD) *
Muir Beach Community Services District (MBCSD)	- Novato System
Stinson Beach County Water District (SBCWD)	- Point Reyes Station System

* All six public agencies provide retail potable water services. Marin Municipal Water District and North Marin Water District also provide retail non-potable water services within limited portions of their service areas with supplies partially provided by the Las Gallinas Valley Sanitary District and the Novato Sanitary District. An overview of these non-potable services is provided as an appendix.

E. Study Review Opportunities

Consistent with the approved scope of work this study has been prepared with an emphasis in soliciting outside public review and comment as well as multiple opportunities for input from the affected agencies. These efforts are summarized below.

- Commission staff appeared before five of the six affected agencies’ governing bodies at public meetings prior to the initiation of the study to discuss the scope of work and possible outcomes byway of the Legislature’s direction (i.e., sphere amendments, boundary changes, and formations and/or consolidations).¹¹

¹¹ Staff did not make a presentation to BCPUD’s Board.

- Administrative copies of all agencies profiles with focus on technical data were provided to the affected agencies for their internal review. Comments received from the agencies were incorporated as needed into completed draft profiles.
- Draft profiles on all agencies were presented to the Commission by region (West and East) for initial discussion and feedback at noticed public hearings between January and May 2015. Notices were subsequently circulated inviting review and comments over a 75-day periods after each presentation. Copies of the draft profiles were also posted on the Commission website.
- A complete draft report was presented to the Commission at a noticed public hearing in September 2015 with a notice subsequently circulated inviting review and comments over a 60-day period. A copy of the draft report was also posted on the website. Copies were also sent to all six affected agencies and all West Marin library branches.
- Commission staff appeared before several city/town councils to solicit public review and comment on the draft profiles and/or draft report. Presentations were made to Corte Madera, Novato (twice), San Rafael (twice), Fairfax, and Mill Valley as well as the County of Marin Board of Supervisors (twice). Presentations on the draft were also made to Marin County’s League of Women Voters, Marin Coalition, and Marin Conservation League.

2.2 STUDY SUMMARY

A. General Conclusions

This study identifies fourteen central themes or conclusions underlying the Commission’s review of the availability, capacity, and performance of public water services now and going forward relative to the agency’s regional growth management duties. These conclusions range in substance from recent usage trends to financial standing and are entirely generated from information detailed in the succeeding sections. Additionally, and as previously detailed, these conclusions are premised on the Commission’s own independent assessment relative to LAFCO’s growth management interests and drawn from the information collected and analyzed between a five-year period of 2009 to 2013.

The study’s general conclusions are based on data collected and analyzed by the Commission between 2009 and 2013 and specific to LAFCO’s prescribed growth management interests under State law.

- **No. 1 | Significant Influence of Public Water Systems**
The six affected agencies organized to provide public water service directly effect nearly every resident in Marin County. This relationship is marked by the six agencies’ water systems collectively serving an estimated 256,230 total residents

within their seven service areas that accounts for 98% of the entire countywide population as of the term of this study.¹²

- **No. 2 | Strong Civic Engagement Among Agencies**

There appears to be relatively high engagement existing between all six affected and their constituencies that helps produce governing boards largely responsive to community needs with no obvious discord; needs that nevertheless vary due to regional and subregional distinctions in social and economic interests.

- **No. 3 | Recent Growth Has Been Proportionally Higher in West Marin**

Overall resident growth within the six affected agencies' service areas over the five-year review period of this study has been modest with a total estimated change of 0.40%. This change is nonetheless noteworthy given it counters historical trends with the proportional intensity being more than two times greater in West Marin's service areas at 1.00% compared to 0.38% in East Marin's service areas.

- **No. 4 | New Growth Will Occur - Albeit Less Intense than Others Estimate**

The six affected agencies are collectively at 90% of their current planned buildout and additional residential growth is expected in the near-term, albeit at measurably less intensities than projected by other regional governing bodies. This includes the Commission estimating six of the seven service areas will collectively add close to 2,000 new residents over the next 10 year period and result in a joint annual growth rate of 0.08% through 2023; a rate that is close to recent changes and five times less than the 0.43% annual projection calculated for the county for the period by the Association of Bay Area Governments (ABAG).¹³

- **No. 5 | Buildout Will Add 30,000 New Residents to Public Water Systems**

The seven service areas are positioned to add an additional 30,000 new residents based on present-day buildout assumptions made by the local land use authorities.¹⁴ These buildout assumptions – which will presumably increase going forward given the State's legislative intent to facilitate housing opportunities – would result in a net increase of 11.5% (or 4,166 acre-feet) in annual demands over current year-end averages, and further stress systems already projected with deficits in single-dry year conditions.

¹² The term end of the study is 2013. The six affected agencies – BCPUD, IPUD, MBCSD, SBCWD, MMWD, and NMWD – collectively include seven service areas with NMWD serving two: Novato and Point Reyes Station. There are also an estimated 3,250 residents in Marin County that lie outside the seven areas and dependent on either private water companies and or private groundwater/spring sources. (This estimate does not consider parcels within the seven service areas that have not established connections to the public water systems.)

¹³ No new residential growth is expected within the next 10 years in BCPUD's service area due to the ongoing moratorium on new water service connections.

¹⁴ The 12 land use authorities (County of Marin and the 11 cities in Marin County) collectively contemplate up to 8,810 new housing units – producing a projected 28,728 additional residents – may be constructed in the seven service areas at buildout based on current land use policies.

- **No. 6 | Regional Factors Have Influenced Public Water Systems Differently**
There are substantive demographic and related distinctions existing between East and West Marin’s service areas that have pronounced and different influences on their respective water systems now and going forward. Examples follow.
 - Residency type within the two regions is significantly different with part-time or non-owner residents making up an estimated 50% or more of the combined population within West Marin’s five service areas. The estimated portion of East Marin’s two service areas dedicated to part-time or non-owner residents, comparatively is estimated at 20%.
 - The regional distinction in residency type helps explain why peak-day ratios (i.e., the difference between average day-use and single highest day-use) in West Marin are 25% above East Marin, and as a result the former service areas have proportionally greater system stresses in meeting high-usage periods.¹⁵
 - Recent census data shows stark and growing differences between East and West Marin’s service areas with the latter being significantly older and having lower household incomes compared to the former.¹⁶ These differences – which are also reflected in increasingly higher unemployment in West Marin despite having a greater share of residents falling within the prime working age (25 to 64) – suggest increasing challenges for the West Marin agencies in funding water operations and improvements over the long-run.
 - Differences in the affected agencies’ economies of scale helps to explain why the medium rate for potable water in West Marin is \$1.28 for every 100 gallons compared to \$0.70 for every 100 gallons in East Marin; almost a twofold difference between the regions.

- **No. 7 | Recent System Demands Have Intensified for Most Agencies**
Relative demand – i.e., agency production measured by residents – during the study’s five-year term has increased for five of the seven service areas in recent years. These increases, which affects BCPUD, IPUD, MBCSD, SBCWD, and NMWD-Novato, have all exceeded the corresponding change in population growth within the respective service areas by no less than threefold and signals system usage intensity – and not new development – has been underlying increases in demands. Additionally, and pertinently, this dynamic suggest overall usage

¹⁵ Peak-day ratios over the five-year period reviewed in this study show West Marin’s five service areas averaged 2.0 compared to 1.6 in East Marin’s two service areas.

¹⁶ The median age within the five West Marin service areas is 53.5 and is nearly one-fourth higher than the median age of 43.9 within the two East Marin service areas. (This separation is also increasing with the median age rising by 6.9% over the prior five-year period in West Marin compared to only 0.7% in East Marin.) A similar separation exists with respect to median household incomes with West Marin’s five service areas averaging \$71,000 compared to \$93,000 in East Marin’s two service areas.

trends will likely revert and increase from their most recent decline in 2015 in response to public calls for conservation once the drought is declared over.

*** It is pertinent to highlight this conclusion is specific to recent trends generated within the five-year review period incorporated into this study (2009-2013). Three agencies – BCPUD, IPUD, and NMWD – have provided documentation to the Commission attesting that their overall system demands have decreased based on a longer sample size of 20 plus years. Copies of these submittals is provided in the appendices.**

• **No. 8 | Supplies Under Normal/Maximum Conditions are in Good Shape**

Existing potable water supplies are sufficient for all six affected agencies to meet current annual demands within the seven service areas under normal and non-peak conditions now and through the end of this study period in 2023. This sufficiency is marked by noting the individual agency annual demand-to-supply ratios range from a low of 15.1% for IPUD to a high of 76.3% for BCPUD with minimal changes for any expected over the next 10 year period. Individual agency peak-day demand-to-supply ratios are generally much higher but remain well within capacity for most of the agencies with the lone exception of BCPUD, which currently tallies 82.7% and expected to rise to capacity at 96.4% by 2023.

• **No. 9 | Supplies Under Projected 1976/77 Conditions Create System Stresses**

Projected single dry-year conditions paralleling 1976/77 show moderate to significant system stresses for five of the seven service areas based on current and/or projected demands through 2023. The agencies with one or more supply deficits under single dry-year conditions when use and demand patterns have not adjusted are BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato. The agencies with the most substantive deficit demand-to-supply ratios are BCPUD and MMWD with both having shortages in all four demand-to-supply categories measured by the Commission.

• **No. 10 | Treatment Capacities are Sufficient With Some Exceptions**

Nearly all of the affected agencies have existing treatment capacities and/or contracts therein to accommodate their five-year average peak-day demands within their respective service areas. The lone immediate exception involves BCPUD whose average peak-day demand equals 103% of the agency's maximum daily treatment capacity and is on pace to reach 107% by 2023. Two other agencies – IPUD and SBCWD – are projected to have their peak-day demands reach their respective daily treatment capacity by 2023.

- **No. 11 | Storage Capacities are Sufficient**

All six affected agencies have existing overall storage capacities to accommodate their current five-year average peak-day demands within their respective service areas and all have at least 50% additional capacity with minimal changes expected over the next 10 years; all of which helps to mitigate against any treatment shortfalls. (There is an individual zone shortfall for MMWD involving Ross Valley.) However, and while not explicit deficit, it is pertinent to note three of the seven service areas have less than three days of potable storage capacity to meet continuous peak-day demands – such as a summer-time fire incident – without recharge. The agencies with less than three days of continuous peak-demand storage are NMWD-Point Reyes at 2.2, MMWD at 2.3, and NMWD-Novato at 2.4.

- **No. 12 | Current Drought Does Not Compare to 1976/77 in Marin County**

The current four-year drought has generated significant and adverse impacts for many communities in California, but not necessarily to date in Marin County. Recent local rainfall totals, markedly, have remained relatively close to historical averages with the notable outlier of 2013 when totals reached only 7.8 inches and fell close to six times below the average tallied over the prior 50 years.¹⁷ Further, rainfall totals have averaged close to one-fourth more each year during the current drought compared to annual averages during the 1976/77 drought.¹⁸ These collective factors affirm utilizing the 1976/77 drought as the benchmark in projecting single dry-year conditions remains appropriate for planning purposes.

- **No. 13 | Near-Term Finances are Good; Long-Term Finances are Mixed**

All six affected agencies have maintained positive current ratios over the five-year review period and finished at no less than 4 to 1; meaning the agencies at a minimum ended with \$4 in current assets for every \$1 in short-term liabilities/obligations. This measurement paired with positive ending operating margins of no less than 8.6% show the agencies' water systems have been generally well-funded and void of structural deficits, and as such indicates near-term finances are in good shape. Similar measurements for long-term solvency, however, are mixed and highlighted by three of the six agencies – SBCWD, MMWD, and NMWD – all ending the five-year period with debt-to-net asset ratios approaching 50%; meaning \$0.50 of every \$1.00 in assets has been financed by debt. All five agencies with pension obligations – BCPUD, IPUD, SBCSD, MMWD, and NMWD – are also underfunded with only one – BCPUD – finishing the most recent reporting period with a funded ratio above 80%

¹⁷ Average annual rainfall amounts measured at the Mount. Tamalpais station (Kentfield) between 1962 and 2011 totaled 47.6 inches. Annual rainfall amounts over the current 2012-2015 statewide drought totaled 57.5 inches in 2012, 7.8 inches in 2013, and 48.3 inches in 2014.

¹⁸ Average annual rainfall amounts measured at the Mount Tamalpais station near Kentfield during the 1976-77 drought totaled 30.8 inches (20.6 inches in 1976 and 40.9 inches in 1977).

- **No. 14 | Conservation Has Limitations; Additional Supplies are Needed**

All six affected agencies have been diligent in pursuing conservation savings in their respective service areas with all appropriately focusing on community education and the larger – MMWD and NMWD – offering various rebate programs. And while conservation is the best and most efficient tool to manage demands it would be prudent planning for all agencies to renew efforts to develop additional supplies - and in particular potable - by enhancing existing sources and/or establishing new sources; a focus that appears to have been generally deemphasized in recent years. This planning is particularly pertinent given non-potable offset opportunities appears limited for most Marin County lands coupled with the narrowing demand-to-supply ratios for the majority of agencies with most projected to have shortfalls under single dry-year conditions.

- **No. 15 | Climate Change Requires Adaptive Planning**

It is relatively certain Marin County will encounter increasingly serious climate impacts due to higher temperatures, more frequent droughts, and rising salt water levels that – among other things – will adversely affect all six affected agencies in terms of supplies, demands, and source quality. These impacts in turn affect the Commission in its directive under State law to produce orderly growth and development consistent with current and future community needs. These factors underlie the need for adaptive planning now and going forward to improve our collective understanding of water-related risks from climate change and to explore and implement strategies to reduce these risks in Marin County.

B. Recommendations

The following recommendations call for specific action either from the Commission and/or by the affected agencies based on information generated as part of this study and outlined below in order of their placement in Section 2.3 (Written Determinations). Recommendations for Commission action are dependent on a subsequent directive from the membership and through the adopted work plan.

1. The Commission should proactively work with local agencies – and in particular water, sewer, and fire providers – to develop a definition of “disadvantaged unincorporated community” consistent with SB 244 to ensure an appropriate and equitable level of municipal services is available for qualifying areas.
2. BCPUD should consider expanding its treatment facility capacity to abate shortfalls in meeting current and projected peak-day demands relative to agency resources and priorities as part of a future capital improvement program.

3. MMWD should consider expanding potable storage in the Ross Valley service zone to abate existing shortfalls and accommodate current and projected peak-day demands relative to agency resources and priorities as part of a future capital improvement program.
4. The Commission recommends the West Marin agencies – BCPUD, IPUD, MBCSD, and NMWD (Point Reyes Station) – jointly prepare a water reliability report assessing each system’s available supplies under different hydrologic periods based on shared planning assumptions.
5. All six affected agencies should continue to pool their respective resources in joint procurement processes to secure services and supplies given their combined buying power produces cost-savings on items of mutual need and benefit. A prime example includes NMWD and MMWD’s beneficial agreement to share capacity and costs therein in the North Marin Aqueduct and its delivery of potable water allocations from Sonoma County.
6. The Commission encourages all six affected agencies to establish and or advance supply enhancement efforts to complement the ongoing focus on conservation to remain fully accountable to future constituents given new growth will occur.
7. The Commission requests the five mutual water companies that have not responded to date – Vista Grande, Shallow Beach, Drakes Landing, Duck Cove, and Hamilton – comply with AB 54 and file their service information with LAFCO without further prompting or action by the membership.
8. The Commission should consider directing staff to prepare an addendum to this study with participation from area landowners to evaluate local needs and priorities within Dillon Beach and Nicasio with respect to possible governance and related options under LAFCO law involving water services.
9. BCPUD should prepare an update on the status of the agency’s moratorium on new water service connections and efforts therein to address the underlying constraints to help – among other items – inform the County of Marin’s ability to effectuate planning policies in the area proceeding ahead. BCPUD has responded it will prepare an update by December 31, 2016.
10. MBCSD should engage an outside consultant to prepare audits of the agency’s financial statements to attest and, if applicable, identify improvements in the District’s fiduciary duty to manage and record its finances consistent with governmental accounting standards.

11. The Commission should incorporate into its pending sphere of influence updates for the affected agencies the policy items marked in this study and include consideration of expansions to account for standing extraterritorial service contracts belonging to MBCSD and NMWD.
12. NMWD and the Commission should collaborate with community members on a potential boundary change to detach approximately 7,700 acres of unincorporated land from the District that includes North Inverness, Tomales Bay, and Marshall. This should include consideration of special legislation to expedite the boundary change and avoid the costs and uncertainties tied holding protest proceedings.
13. The Commission should consider directing staff to prepare an addendum to this study with agency participation to assess the viability of any service and cost efficiencies tied to consolidating MMWD and NMWD. The central objective of the addendum would be to inform the membership, agencies, and general public with respect to the merits/demerits of a potential consolidation and to justify any subsequent actions, including maintaining the status quo.
14. Looking ahead to future studies the Commission should explore and discuss the potential to establish community wastewater systems with MBCSD, IPUD, SBCWD, and NMWD (Point Reyes Station) given the increasing cost and environmental considerations tied to maintaining septic systems in these areas.
15. Given its mandate and existing deficit therein the Commission should devote resources to develop institutional knowledge about the specific impacts on climate changes as it relates to, and among other areas, community water resources using best available science and incorporate into future studies.

2.3 WRITTEN DETERMINATIONS

The Commission is directed to prepare written determinations to address the multiple governance factors enumerated under G.C. Section 56430 anytime it prepares a municipal service review. These determinations are similar to findings and serve as independent statements based on information collected, analyzed, and presented in this study's subsequent sections. The underlying intent of the determinations is to provide a succinct detailing of all pertinent issues relating to the planning, delivery, and funding of public water services as it relates to the Commission's role and responsibilities. An abridged version of these determinations will be separately prepared for Commission consideration and adoption with the final report.

These determinations detail the pertinent issues relating to the planning, delivery, and funding of public water services relative to the Commission's interests. Determinations based on data collected and analyzed between 2009 and 2013.

A. Growth and Population Projections

Regional

1. The Commission estimates there are 256,230 total residents directly served by the six agencies' potable water systems as of the term of the study period. It is also estimated the combined service population has modestly increased by 992 or 0.38% over the prior five-year review period.
2. The Commission estimates overall resident growth in the five service areas in West Marin has increased by 1.0% over the study period and is more than two times greater than the 0.4% growth rate in the two East Marin service areas.
3. It is projected by the Commission residential growth trends over the study period will largely continue over the succeeding 10-year period and produce a modest overall annual resident change of 0.08% and add 2,002 new persons by 2023 within the six affected agencies' seven service areas.
4. A significant distinction exists between West and East Marin involving residency type with part-time or non-owner residents making up more than 50% of the combined population within the former's five service areas compared to 20% in the latter's two service areas. This distinction helps to explain why average peak-demands in West Marin are nearly 25% greater in intensity to East Marin during the study period.
5. It is anticipated by the Commission for planning purposes a total of 8,810 new housing units – producing a projected 28,728 additional residents – will eventually be constructed within the six affected agencies' seven service areas at buildout based on current land use policies.
6. Current demographic information shows marked differences between East and West Marin with increasing challenges for the latter residents' ability to fund water operations and improvements in the long-run given relative advanced age, low household incomes, and higher poverty rates.
7. Totaled assessed value for the six affected agencies' jurisdictional lands equals \$41.7 billion and represents 70% of the countywide valuation total.
8. Population density ratios range from a low of 196 residents for every square mile in SBCWD to a high of 1,255 residents for every square mile in MMWD as of the term of the study period.

9. The Commission estimates BCPUD is at 89% of the service area's current buildout population with 1,574 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume BCPUD's resident population will remain stagnant through 2023 given the existing moratorium on new water service connections. Related statements follow.
 - a) BCPUD's fulltime residents are generally at an economic disadvantage compared to countywide averages based on median household income and poverty rate discrepancies. The rate of these discrepancies is also escalating and marked by a significant one-half increase in the number of persons living under the poverty rate over the study period.
10. The Commission estimates IPUD is at 87% of the service area's current buildout projection with 1,375 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume the annual growth rate will match the study period with an overall yearly change of 0.12% and lead to an increase of 17 to 1,391 by 2023. Related statements follow.
 - a) IPUD's fulltime residents are significantly older – and getting older – compared to countywide averages. Residents have also experienced a notable decline in economic standing with close to a one-fourth decrease in the median household income along poverty rates doubling over the study period.
11. The Commission estimates MBCSD is at 94% of the service area's current buildout projection with 431 residents served by the District's potable water system as of term of the study period. It is reasonable to assume the growth rate will match the study period with an overall yearly change of 0.40% and lead to an increase of 19 to 448 by 2023. Related statements follow.
 - a) MBCSD's fulltime residents are generally more affluent, homogeneous, and formally educated compared to countywide averages despite similar ages. Further, the rate of the community's affluence is escalating with the median household income having increased by two-thirds over the study period and now standing nearly double the countywide average.
12. The Commission estimates SBCWD is at 92% of the service area's current buildout projection with 1,957 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume the annual growth rate in will match the study period with an overall yearly change of 0.14% and lead to an increase of 28 to 1,985 by 2023. Related statements follow.

- a) SBCWD’s fulltime residents are becoming increasingly older and more homogenous relative to countywide averages. SBCWD’s residents have also experienced a sharp decline in economic standing over the study period with median househline income declining by over one-fourth.
13. The Commission estimates MMWD is at 89% of the service area’s current buildout projection with 186,048 residents served by the District’s potable water system as of the term of the study period. It is reasonable to assume the growth rate within MMWD will match the study period with an overall yearly change of 0.07% and lead to an increase of 2,038 to 187,399 by 2023. Related statements follow.
 - a) MMWD’s fulltime constituents are aligned with countywide averages with respect to social and economic indicators with the two statistical significant exceptions: District customers have increasingly higher median household incomes and more formal education. A growing economic disparity has also emerged in which overall median incomes have generally remained stagnant while unemployment levels have increased by nearly one-half.
 14. The Commission estimates NMWD is at 94% of the service areas’ current buildout projection with 64,845 total residents served by the District’s two potable water systems as of the term of the study period. It is reasonable to assume the growth rates within NMWD and for its two service areas – Novato and Point Reyes Station – will match the study period with an overall yearly change of 0.08% and lead to an increase of 587 to 65,432 by 2023. Related statements follow.
 - a) NMWD’s fulltime residents served by the Novato system are generally statistically aligned with countywide averages with respect to social and economic indicators with the notable exceptions of lower median household incomes and higher unemployment levels.

B. Location and Characteristics of Disadvantaged Unincorporated Communities

1. Two unincorporated communities in Marin County presently qualify as disadvantaged under the statewide definition based on recent census information: Alto and Marin City. Both communities – whose median incomes fall below 80% of the statewide average and therefore qualify as disadvantaged under the statewide definition – are located in southern Marin County and lie in MMWD with an estimated joint population of 20,680 with over 90% in Marin City.

2. A third unincorporated community – Nicasio in central Marin County – previously qualified as disadvantaged under the statewide definition before slightly exceeding the median household income threshold in the latest census. This community and its estimated population of 100 lies outside of any public water system’s sphere of influence and dependent on private groundwater sources.
3. It is reasonable to assume other unincorporated communities in Marin County would qualify as “disadvantaged” upon completion of the Commission’s scheduled policy review to establish its own definition as provided under Senate Bill 244 in 2011. The Commission should proactively work with other local agencies – and in particular water, sewer, and fire providers – in developing a definition to meet the legislation’s intent to ensure an appropriate and equitable level of municipal services is available for the affected areas.

C. Capacity of Public Facilities and Infrastructure Needs and Deficiencies

1. The Commission estimates the total combined maximum annual water supply available to the six affected agencies under normal conditions is 119,080 acre-feet. The average and combined annual water demand over the study period among all six affected agencies equals 31% of the estimated maximum supply.
2. All six affected agencies have positive annual demand-to-supply ratios under normal conditions based on five-year averages over the study period within their seven service areas ranging from a low of 15% for IPUD to a high of 76% for BCPUD. Minimal changes to these ratios are expected through 2023.
3. The Commission estimates the total combined maximum annual water supply available to the six affected agencies under single dry-year conditions is 37,758 acre-feet; a reduction of (68%) compared to normal conditions. The average and combined annual water demand over the study period among all six affected agencies equals 98% of the estimated maximum supply under single dry-year conditions.
4. Two of the six affected agencies – BCPUD and MMWD – have negative annual demand-to-supply ratios under projected single dry-year conditions based on annual averages within their service areas over the study period. Two additional agencies – MBCSD and NMWD (Novato) – are expected to reach supply capacity relative to annual demands by 2023.
5. Overall annual demands have increased for five of the seven service areas belonging to the six affected agencies during the study period. These agencies are BCPUD, IPUD, MBCSD, SBCWD, and NMWD (Novato).

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6. Average daily water demand per resident in the two East Marin service areas during the study period has been 128 gallons. This amount is nearly double the average rate of 77 gallons within the five service areas in West Marin.
7. Demand trends over the study period show system intensity occurring for four of the five services areas in West Marin with all experiencing rises in per capita demands that exceed their estimated population change. These West Marin agencies are BCPUD, IPUD, MBCSD, and SBCWD.
8. The Commission projects an overall decrease in annual water demands among all six affected agencies of (3.4%) by 2023 based on study period trends; a net savings of (1,268) acre-feet over the baseline year and largely attributed to decreases within MMWD. This projection is also reflected in shared relative demand with combined per capita daily use decreasing from 131 to 126 gallons.
9. Irrespective of overall savings, annual demands are expected to increase for four of the seven service areas served by the six affected agencies by collectively 506 acre-feet or 5.0% based on study period trends and involve IPUD, MBCSD, SBCWD and NMWD (Novato). The remaining three service areas served by MMWD, BCPUD, and NMWD (Point Reyes) are expected to experience decrease demands collectively totaling (1,774) acre-feet or (6.4%).
10. The Commission projects the six affected agencies combined average per capita water allowance at current buildout under normal and single dry-year conditions is 373 and 118 gallons, respectively; a comparison difference of (68%).
11. Nearly all six affected agencies have adequate treatment capacity to accommodate peak-day demands within their service areas based on annual averages over the study period. The lone exception is BCPUD with a demand-to-supply ratio of 102% or (2%) during the study period. Two additional agencies – IPUD and SBCWD – are projected to approach their treatment capacity limits by 2023.
12. All six affected agencies have adequate storage capacity to accommodate peak-day demands within their service areas based on annual averages over the study period with excess capacity of no less than 50%. Minimal changes in these ratios are expected within the succeeding 10-year period.

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13. BCPUD's water infrastructure presently operates with available capacity in two of the three measured categories with surpluses in supply and storage based on production demands through the study period under normal conditions. Only treatment capacity has been at a deficit and specific to meeting peak-day demands. Projected single dry-year conditions generate additional and generally moderate infrastructure constraints now and going forward to 2023 and

highlighted by annual and peak-day demands exceeding supplies. Specific ratios follow.

- a) BCPUD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 69% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 112% – or (12%) – under the baseline year and slightly lower to (10%) by 2023.
 - b) Annual demands in BCPUD over the study period increased by an equivalent of 2.3% each year and driven by a production spike in the last year of review. The Commission estimates annual demands over the next 10-year period will reverse and decrease by (1.0%) each year through 2023.
 - c) Average peak-day demands within BCPUD over the study period equals 66% of available daily supplies under normal conditions and rises to a (6%) deficit during projected single dry-year conditions.
 - d) BCPUD's average daily per capita demand over the study period has been 66 gallons. The projected maximum daily per capita supply allowance for BCPUD at current buildout of the service area under normal and single dry-year conditions is 84 and 52 gallons, respectively.
 - e) BCPUD's treatment facility is at 103% capacity in accommodating existing peak-day averages within the service area based on study period totals. This ratio deficit is expected to rise to 107% – or (7%) – by 2023.
 - f) BCPUD's storage facilities is at 27% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 28% by 2023.
 - g) The total number of days BCPUD's current storage facilities can accommodate the average peak-day demand generated during the study period is 3.7. This ratio is expected to slightly decrease to 3.6 days by 2023.
14. IPUD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under both normal conditions and projected single dry-year conditions. Limited and relatively moderate infrastructure constraints are projected going forward to 2023 and specific to dwindling treatment capacity to meet expected peak-day demands. Specific ratios follow.

- a) IPUD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 14% of the District's accessible sources. This ratio rises to 52% under projected single dry-year conditions under the baseline year and advances to 63% by 2023.
 - b) Annual demands in IPUD over the study period increased by an equivalent of 1.7% each year. The Commission estimates annual demands over the next 10-year period will decelerate by nearly two-fold and increase by only 0.8% each year through 2023.
 - c) Average peak-day demands within IPUD over the study period equals 14% of available daily supplies under normal conditions and rises to 17% during projected single dry-year conditions.
 - d) IPUD's average daily per capita demand over the study period has been 45 gallons. The projected maximum daily per capita supply allowance for IPUD at current buildout of the service area under normal and single dry-year conditions is 297 and 77 gallons, respectively.
 - e) IPUD's treatment facility is at 70% capacity in accommodating existing peak-day averages with the service area based on study period totals. This percentage is expected to reach near capacity at 87% by 2023.
 - f) IPUD's storage facilities is at 29% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 35% by 2023.
 - g) The total number of days IPUD's current storage facilities can accommodate the average peak-day demand generated during the study period is 3.5. This ratio is expected to decrease to 2.8 days by 2023.
15. MBCSD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Moderate to significant infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and specific to demands nearing and exceeding, respectively, annual and peak-day water supplies. Specific ratios follow.

- a) MBCSD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 56% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 86% and advances to near capacity at 94% by 2023.
 - b) Annual demands in MBCSD over the study period increased by an equivalent of 1.8% each year. The Commission estimates annual demands over the next 10-year period will slightly decelerate to 1.0% through 2023.
 - c) Average peak-day demands within MBCSD equals 83% of available daily supplies under normal conditions and rises to 314% – or a (214%) deficit – during projected single dry-year conditions.
 - d) MBCSD's average daily per capita demand over the study period has been 53 gallons. The projected maximum daily per capita supply allowance for MBCSD at current buildout of the service area under normal and single dry-year conditions is 98 and 61 gallons, respectively.
 - e) MBCSD's treatment facility is at 26% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to modestly rise and reach 31% by 2023.
 - f) MBCSD's storage facilities are at 8% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to modestly rise to 10% by 2023.
 - g) The total number of days MBCSD's current storage facilities can accommodate the average peak-day demand generated during the study period is 11.9. This ratio is expected to slightly decrease to 10.2 days by 2023.
16. SBCWD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Relatively modest infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and specific to peak-day demands exceeding supplies along with approaching treatment capacities. Specific ratios follow.
- a) SBCWD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 13% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 55% under the baseline year and advances to 76% by 2023.

- b) Annual demands in SBCWD over the study period increased by an equivalent of 1.9% each year. The Commission estimates annual demands during the next 10-year period will intensify and increase by 3.3% through 2023.
 - c) Average peak-day demands within SBCWD over the study period equals 22% of available daily supplies under normal conditions and rises sharply to near capacity at 91% during projected single dry-year conditions; the latter of amount reaching an expected deficit of (27%) by 2023.
 - d) SBCWD's average daily per capita demand over the study period has been 75 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 531 and 125 gallons, respectively.
 - e) SBCWD's treatment facility is at 63% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to near capacity and reach 87% by 2023.
 - f) SBCWD's storage facilities are at 21% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 29% by 2023.
 - g) The total number of days SBCWD's current storage facilities can accommodate the average peak-day demand generated during the study period is 4.9. This ratio is expected to slightly decrease to 3.5 days by 2023.
17. MMWD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Minimal to moderate infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and highlighted by annual and peak-day demands exceeding available water supplies. Specific ratios follow.
- a) MMWD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 28% of the District's accessible sources. This ratio changes under projected single dry-year conditions to a deficit of (1%) under the baseline year and settles back slightly to near capacity at 98% by 2023.
 - b) Annual demands in MMWD over the study period decreased by an equivalent of (0.3%) each year. The Commission estimates annual demands during the next 10-year period will further de-intensify at (0.6%) each year through 2023.

- c) Average peak-day demands within MMWD over the study period equals 48% of available daily supplies under normal conditions and rises sharply to a deficit of (59%) during projected single dry-year conditions.
 - d) MMWD's average daily per capita demand over the study period has been 127 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 199 and 111 gallons, respectively.
 - e) MMWD's treatment facilities is at 61% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to slightly decrease to 59% by 2023.
 - f) MMWD's storage facilities are at 44% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to decrease to 42% by 2023.
 - g) Irrespective of the preceding comment, storage improvements are needed in Ross Valley to improve holdings to accommodate this pressure zone's existing and projected peak-day demands.
 - h) The total number of days MMWD's current storage facilities can accommodate the average peak-day demand generated during the study period is 2.3. This ratio is expected to slightly increase to 2.4 days by 2023.
18. NMWD's water infrastructure for the Novato system operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Modest to moderate infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and highlighted by annual and peak-day demands approaching and exceeding, respectively, available supplies. Specific ratios follow.
- a) NMWD's potable supplies for the Novato system under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 41% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 87% under the baseline year and advances to near capacity at 98% by 2023.
 - b) Annual demands in the Novato system over the study period increased by an equivalent of 0.8% each year. The Commission estimates annual demands during the next 10-year period will de-intensify and increase by 0.4% each year through 2023.

- c) Average peak-day demands within the Novato system over the study period equals 53% of available daily supplies under normal conditions and rises sharply to a (5%) deficit during projected single dry-year conditions.
 - d) NMWD's average daily per capita demand in the Novato system over the study period has been 130 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 305 and 142 gallons, respectively.
 - e) NMWD's treatment facilities within the Novato system is at 57% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to rise to 64% by 2023.
 - f) NMWD's storage facilities within the Novato system are at 42% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to rise to 45% by 2023.
 - g) The total number of days NMWD's current storage facilities within the Novato system can accommodate the average peak-day demand generated during the study period is 2.4. This ratio is expected to decrease to 2.1 days by 2023.
19. NMWD's water infrastructure for the Point Reyes Station system operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under both normal conditions and projected single dry-year conditions. Limited and modest infrastructure constraints are projected going forward to 2023 and specific to dwindling storage to meet expected peak-day demands. Specific ratios follow.
- a) NMWD's potable supplies for the Point Reyes Station under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 39% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 45% under the baseline year and slightly less to 44% by 2023.
 - b) Annual demands in the Point Reyes Station's system over the study period decreased by an equivalent of (3.1%) each year. The Commission estimates annual demands during the next 10-year period will continue to decrease – albeit at a lesser intensity – at (0.2%) each year through 2023.
 - c) Average peak-day demands within the Point Reyes Station over the study period equals 78% of available daily supplies under normal conditions and holds therein during projected single dry-year conditions.

- d) NMWD’s average daily per capita demand within Point Reyes Station over the study period has been 118 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 178 and 153 gallons, respectively.
- e) MWD’s treatment facility for Point Reyes Station is at 68% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to slightly adjust downward to 67% by 2023.
- f) NMWD’s storage facilities for Point Reyes Station are at 45% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to generally hold through 2023.
- g) The total number of days NMWD’s current storage facilities within Point Reyes Station can accommodate the average peak-day demand generated during the study period is 2.2. This ratio is expected to hold through 2023.

D. Agencies’ Financial Ability to Provide Services

1. All six affected agencies experienced moderate to significant gains in their overall financial standing as measured by total net assets or equity during the study period. The collective increase in the agencies combined net assets totaled \$35.4 million and represents a difference of 9.6%.
2. All six affected agencies finished the study period in generally good position with respect to liquidity and profitability with all finishing with current ratios of no less than 4 to 1 and operating margins that exceed corresponding changes in inflation. Three of the agencies – SCBWD, MMWD, and NMWD – however finished with relatively high debt ratios that approach 50% of their respective net assets.
3. Five of the six affected agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – have existing pension obligations through separate contracts with CalPERS. These contracts include mandatory contributions based on annual actuarial reports prepared by CalPERS with the corresponding rates collectively increasing over the most recent five year period (2010-15) by an approximate 20% average.
4. The combined active-to-retiree ratio between the five subject agencies is 0.79 to 1.00; an amount meaning there are approximately four active employees contributing to the pension system for every five retired employees.

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5. Four of the five subject agencies – BCPUD, IPUD, SBCWD, and NMWD – with pension have experienced no less than a 13.5% increase in the actual pension costs over the last three available years of documentation (2011-13); a change nearly three times greater than the corresponding inflation rate for the region.
6. Only BCPUD has a funded status above 80% as of the last report issuance by CalPERS; the standard threshold used in governmental accounting to identify relatively stable pension plans.
7. The current average residential cost for potable water service weighted among all seven service areas is \$0.78 for every 100 gallons, and translates to an annual cost of \$1,175 based on consumption rates over the study period.

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8. BCPUD has maintained positive year-end operating balances in four of the five years reviewed in the study period with an average net of 25% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than threefold. Related statements follow.
 - a) BCPUD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 3 to 1.
 - b) BCPUD's capital is good with low long-term debts equaling only 18% of total net assets at the close of the study period.
 - c) BCPUD finished the study period with one of the highest unrestricted fund balances relative to service population with a per capita amount of \$1,037.
 - d) BCPUD's pension obligations is in relatively good shape with a funded ratio (market) at the end of the study period of 81.4%; the highest and best ratio among the five subject agencies.
9. IPUD has maintained positive year-end operating balances in all five years of the study period with an average net of 18% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than two-fold. Related statements follow.
 - a) IPUD's liquidity is extremely high with current assets outpacing current liabilities at the close of the study period by 227 to 1.
 - b) IPUD's capital is good with very low long-term debts equaling only 3% of total net assets at the close of the study period.
 - c) IPUD finished the study period with a relatively low unrestricted fund balance relative to service population with a per capita amount of \$175.

- d) ICPUD's pension obligations are modestly underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 75%; the second highest and best ratio among the agencies.
10. MBCSD has maintained positive year-end operating balances in all five years of the study period with an average net of 118% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than one-tenth. Related statements follow.
- a) MBCSD's liquidity is relatively high with current assets outpacing current liabilities at the close of the study period by 37 to 1.
 - b) MBCSD's capital is untouched with no long-term debts booked at the close of the study period.
 - c) MBCSD finished the study period with a relatively high unrestricted fund balance relative to service population with a per capita amount of \$1,761; the highest ratio among the agencies.
 - d) MBCSD has no pension obligations.
11. SBCWD has maintained positive year-end operating balances in all five years of the study period with an average net of 15% of revenues over expenses. Trends during this period, however, are narrowing with the growth rate of revenues falling short of the growth rate of expenses by one-tenth. Related statements follow.
- a) SBCWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 5 to 1.
 - b) SBCWD's capital is marginal with long-term debts equaling 46% of total net assets at the close of the study period.
 - c) SBCWD finished the study period with a relatively moderate unrestricted fund balance relative to service population with a per capita amount of \$679.
 - d) SBCWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 67%; the lowest ratio among the agencies.

12. MMWD has maintained positive year-end operating balances in all five years of the study period with an average net of 8% of revenues over expenses. Trends during this period are also positive with the growth rate of revenues exceeding the growth rate of expenses by over three-fold. Related statements follow.
 - a) MMWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 5 to 1.
 - b) MMWD's capital is marginal with long-term debts equaling 43% of total net assets at the close of the study period.
 - c) MMWD finished the study period with a relatively modest unrestricted fund balance relative to service population with a per capita amount of \$209.
 - d) MMWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 68%; the second lowest ratio among the agencies.
13. NMWD has experienced negative year-end operating balances in four of the five of the study period with an average net loss of (19%) of revenues over expenses. Trends during this period, however, are improving with the growth rate of revenues exceeding the growth rate of expenses by two-fifths. Related statements follow.
14. NMWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 4 to 1.
 - a) NMWD's capital is marginal with long-term debts equaling 45% of total net assets at the close of the study period.
 - b) NMWD finished the study period with a relatively modest unrestricted fund balance relative to service population with a per capita amount of \$202.
 - c) NMWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 72%.

E. Status and Opportunities for Shared Facilities and Resources

1. The five agencies serving West Marin have developed an informal network to communicate current and pending activities within their respective service areas and share best practices that ultimately benefit their constituents.

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2. The Commission recommends the West Marin agencies jointly invest resources to prepare a water reliability report assessing each system's available supplies under different hydrologic periods based on shared planning assumptions.
3. MMWD and NMWD have effectively partnered with other local agencies in jointly funding and establishing regional recycled water programs as part of the North Bay Water Reuse Authority. This joint-powers provides a mechanism for MMWD and NMWD to pool resources in securing competitive governmental subventions to implement and expand recycled water services in their service areas to help offset potable demands and have generated a combined average savings over the five-year review period of 836 acre-feet.
4. Near-term opportunities for West Marin agencies to partner and/or develop their own recycled water services to offset potable demands is minimal given the lack of current community wastewater collection systems.
5. All six affected agencies have their own procurement processes with respect to purchasing supplies and materials in support of providing potable water services within their respective service areas. More recently some of the agencies have also begun developing joint-procurement activities with other agencies. The Commission encourages the continued pursuant of these cooperative relationships and the efficiencies and cost-savings they produce.

F. Local Accountability and Government Restructure Options

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1. All six affected agencies and their constituents benefit from employing capable and dedicated management that appear to effectively administer day-to-day activities consistent with governing directives and community needs.
2. The general managers and staff for the six affected agencies have shown timely leadership by proactively engaging their boards and constituents on the ongoing status of their water systems in response to the current statewide drought. This includes partnering together in various cross-community forms to discuss and educate the public on the challenges and opportunities tied to the drought and promotion therein of more sustainable land/water use relationships.
3. Relative to conservation efforts there is noticeable silence among the majority of the six affected agencies with respect to adding potable supplies to meet future system demands despite most having deficits under single dry-year conditions. While the Commission recognizes conservation is the best and most efficient tool to manage demands it is equally important to consider supplies and enhancement opportunities given its perennial need, value, and – based on history – escalating costs. The Commission, accordingly, recommends the

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agencies consider supply enhancements in line with ongoing conservation programs going forward to remain fully accountable to future constituents given new growth will occur.

4. As of date only 6 of the 12 identified mutual water companies in Marin County have provided the Commission with service information – including boundary maps – as required under Assembly Bill 54 (2012). The Commission requests the four mutual water companies that have not responded to date – Vista Grande, Shallow Beach, Drakes Landing, Duck Cove, and Hamilton – comply with this legislative requirement without further prompting.
5. Information collected to date suggest there may be merit for the Commission to explore public water service options for two unincorporated communities: Dillon Beach and Nicasio. Both areas are presently dependent on a combination of mutual water companies and/or private groundwater sources that are generating increasing questions regarding availability and quality. If agreeable the County should direct staff to prepare an informational report with participation from area landowners on these communities’ governance and related options therein under LAFCO law for future discussion and possible action.

Agencies

6. BCPUD has maintained an emergency moratorium on new water service connections since 1971 due to concerns over supply deficiencies that as a consequence has effectively stalled community planning in the area. It would be prudent for BCPUD to prepare an update on the status of the moratorium and efforts to address the underlying constraints in order – among other factors – to help clarify the ability of the County of Marin to effectuate its adopted planning policies within the community proceeding ahead.
7. MBCSD should engage an outside consultant to prepare audits of the agency’s financial statements to attest and, if applicable, identify improvements in the District’s fiduciary duty to effectively manage its resources consistent with governmental accounting standards.
8. In step with a future sphere of influence update for MBCSD it would be appropriate for the Commission to consider the merits/demerits of expanding the designation to include existing outside service connections located in Frank Valley along Muir Woods Road.
9. A cursory review of reorganization options indicates a more detailed review is appropriate to more clearly assess the merits of a consolidation between MMWD and NMWD with respect to syncing water services along the 101 corridor. If agreeable the Commission should direct staff with agency participation to prepare an informational report assessing the viability of any service and cost efficiencies

tied to consolidation with the central objective of informing the membership, agencies, and the public of options – including justification for the baseline.

10. In step with a future sphere of influence update for NMWD it would be appropriate for the Commission to consider all of the following.
 - a) NMWD’s existing jurisdictional boundary entirely overlaps the jurisdictional boundary of IPUD. This overlap merits correction and the Commission should work with the affected agencies to expedite an appropriate adjustment to both the spheres and boundaries as the membership deems appropriate.
 - b) NMWD’s potable water services in the Point Reyes Station system extends beyond the agency’s sphere and jurisdictional boundary and provides services to several commercial agricultural properties. The Commission should consider the merits/demerits of expanding the sphere and possible annexation of these outside lands to memorialize NMWD’s existing commitments and provide long-term assurances to the landowners of service availability to support the viability of agricultural production going forward.
 - c) NMWD’s existing sphere excludes a portion of the District jurisdictional boundary comprising the unincorporated communities of Tomales Bay and Marshall. NMWD provides no services within these lands and has stated there are no plans in the future to initiate any services. Accordingly, it would be appropriate for the Commission to work with NMWD and area landowners to facilitate detachment with the additional consideration of pursuing special legislation to mitigate against the costs and uncertainties tied to going through regular protest proceedings.
 - d) NMWD’s potable water services extends beyond the sphere of influence and into Sonoma County byway of both earlier annexations and outside service contracts. This Commission should consider the merits/demerits of expanding the sphere to recognize these existing service commitments in consultation with Sonoma LAFCO.

H. Matters of Local Interests as Required by Policy / Relationship Between Services and Land Use Policies

1. Looking ahead the Commission should explore and discuss the potential to establish community wastewater systems with MBCSD, IPUD, SBCWD, and NMWD (Point Reyes Station) given the dynamic of existing and planned development in these low-lying areas coupled with the increasing cost and environmental considerations tied to maintaining septic systems.

2. Given its mandate and existing deficit therein the Commission should devote resources to develop institutional knowledge about the specific impacts on climate changes as it relates to, and among other areas, community water resources using best available science and incorporate into future studies.

CHAPTER THREE SERVICE CHARACTERISTICS

3.1 SERVICE AREAS

A. Population Trends

The resident population collectively served by the six existing affected public agencies responsible for providing potable water in Marin County is estimated by the Commission at 256,230 as of the term of this study period (2013).²⁰ This estimate is specific to residents directly tied to the potable water systems and disproportionately divided between East and West Marin with 97% - or 248,939 - residing in the former and specifically within MMWD and NMWD-Novato. It is also estimated the six affected agencies are collectively at 90% of their projected and combined buildout total of 284,958 in their present jurisdictional boundaries based on the current policies of the 12 land use authorities; policies that collectively contemplate up to 8,810 new units *may* be eventually built within their respective housing elements covering 2014-2022 (italics denotes variable in tied to market demand along with successful project approvals).

LAFCO estimates there are 256,230 total residents served by the six public agencies responsible for providing potable water service in Marin County as of the end of this study period. It is also estimated the combined service population has increased by 992 or 0.38% over the study period.

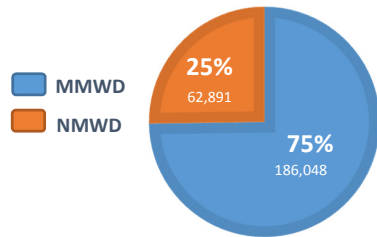
Estimated resident totals within all six affected agencies has increased by a combined 992 or 0.38% over study period. More than two-thirds of the estimated total – or 687 – has occurred within MMWD and close to one half tied to two subdivision projects: Ventana Villas in the City of San Rafael and Rose Garden in the City of Larkspur. However, and proportionally, most of the estimated new resident growth in the study period has occurred in West Marin’s five service areas, which have collectively experienced a 1.0% overall increase despite one agency – BCPUD – having a standing moratorium on new service connections. This proportional increase in West Marin has been driven by close to 2.0% overall increases in both MBCSD and NMWD-Point Reyes Station.

Overall resident growth in the five service areas in West Marin has increased by 1.0% over the study period and is more than two times greater than the 0.4% growth rate in the two East Marin service areas.

²⁰ The estimated total resident service population of 256,230 as of the term of this study period has been independently calculated by the Commission. The projection largely draws on a hybrid calculation provided under California Code of Regulations specific to community water systems and based on multiplying the total number of active residential connections by either a factor of 2.8 for the five West Marin systems or 3.3 for the two East Marin systems. The calculation also includes a flat assignment of 4,000 residents for the San Quentin State Prison.

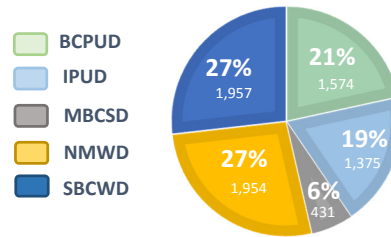
East Marin / Population Breakdown

248,939 Total Residents



West Marin / Population Breakdown

7,291 Total Residents



With respect to projections going forward, and for purposes of this study, it is assumed the resident growth rate within all six affected agencies will generally match the five year study period (2009-2013). This assumption produces an overall and projected annual change of less than one-tenth of a percent or 0.08% in resident growth over the succeeding 10-year period. The substantive result of this assumption would be an overall increase in the combined resident service population of 2,002 and produce a total of 258,232 by 2023. It also indicates – and if this growth rate holds thereafter – the current and combined projected buildout population of 284,958 at this time would be reached in 2153 with the annual additions ranging from 195 to 218 residents each year. (The term “buildout” is specific to current land use policies with the corresponding projections being dynamic and will increase overtime in step with the State’s directive for local agencies to plan and accommodate new housing opportunities.)

It is assumed recent residential growth trends will generally continue over the succeeding 10-year period and produce an overall annual resident change of 0.08% and add 2,002 new persons by 2023.

LAFCO Resident Population Projections / Region
Table 3-1 (Marin LAFCO)

Category	2009	2013 -Baseline-	2023	Annual Trend	Buildout Estimate	Buildout Breakdown
West Marin Agencies	7,220	7,291	7,417	0.17	9,226	3.24
East Marin Agencies	248,018	248,939	250,750	0.07	275,732	96.76
Totals	255,238	256,230	258,168	0.08%	284,958	100.0%

LAFCO Resident Population Projections / Agencies
Table 3-2 (Marin LAFCO)

Agency	2009	2013 -Baseline-	2023	Annual Trend	Buildout Estimate	Buildout Year
West Marin						
BCPUD	1,574	1,574	1,574	0.00	1,784	n/a
IPUD	1,366	1,375	1,392	0.12	1,582	2130
MBCSD	422	431	450	0.43	459	2028
SBCWD	1,943	1,957	1,985	0.14	2,125	2072
East Marin						
MMWD	185,361	186,048	187,399	0.07	209,907	2180
NMWD – Novato	62,657	62,891	63,396	0.08	65,825	2071
NMWD – Point Reyes St.	1,915	1,954	2,036	0.41	3,276	2180
Totals:	255,238	256,230	258,232	0.08	284,958	2153

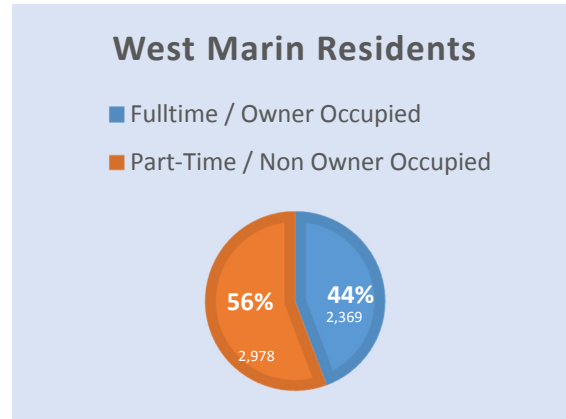
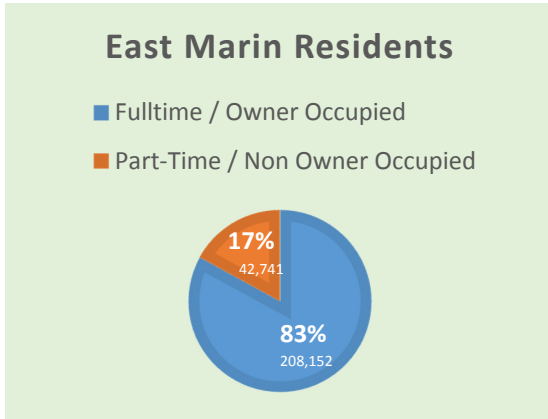
- * It is assumed for purposes of this study the current moratorium on new water service connections within BCPUD will continue indefinitely. The term “buildout” is specific to current land use policies.



B. Residency Types

The Commission projects the estimated resident population total of 256,230 served by the six affected agencies as of the term end of this study period is divided between 210,521 residents that are either fulltime or owner-occupied and 45,719 residents that are either part-time or non-owner occupied. These projections produces an overall 82% to 18% split in favor of fulltime or owner-occupied residents that is considerably weighted by MMWD trends given it represents nearly three-fourths of all affected residents. A closer and proportional examination of individual agency estimates shows a distinct regional trend in which the split is significantly different in West Marin where fulltime or owner-occupied residents are collectively one-half lower at 44% compared to East Marin. This latter distinction is highlighted by the presumed prevalence of secondary residence uses in West Marin and highlighted by SBCWD where it is estimated that only 31% of residents are fulltime.

A significant distinction exists between West and East Marin with respect to residency type with part-time or non-owner residents making up more than 50% of the combined population within the former's five service areas (Muir Beach, Bolinas, Inverness, Stinson Beach, and Point Reyes Station). Comparatively, part-time or non-owner residents represents less than 20% of the population in East Marin.



Residency Type / Agency							
Table 3-3 (Marin LAFCO)							
Type	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt. Reyes St.
Fulltime / Owner Occupied	59.4%	57.6%	69.5%	31.1%	83.4%	81.8%	45.0%
Part-Time / Non Owner Occupied	40.6%	42.4%	30.5%	68.9%	16.6%	18.2%	55.0%
	West Marin			East Marin		West Marin	

C. Residential Trends

Additional residential development – albeit to different degrees – is planned within all six affected local agencies’ service areas, and accordingly represents a significant impact on the availability of future supplies going forward. The central source for this future planning is largely tied to State law and its requirement for land use authorities (i.e., cities and counties) to include housing elements in their general plans that make adequate provision for existing and projected housing needs of all economic segments of the community. These underlying statutes were amended by Senate Bill 375 in 2008 to require – among other items – housing elements be revised and updated every eight years beginning in 2010 to address the State’s new regional housing assignments. The intent of the housing element law is to create a market-based strategy for local land use authorities to facilitate opportunities to increase in the supply and affordability in housing; actual construction of additional housing is not required by the State.²¹

Future residential development will occur in Marin County – if for no other reasons – to meet the State’s directive for all land use authorities to appropriately plan and accommodate housing for the current and future workforce.

²¹ A pertinent and related section of LAFCO law directs commissions to facilitate orderly growth and development that includes providing housing for persons and families of all incomes under Government Code Section 56001.

With the preceding comments in mind, and for purposes of telegraphing future buildout conditions as part of this study, the Commission believes it is reasonable to assume the potential development of 8,810 new housing units in the six affected agencies' existing jurisdictional boundaries. (There is no specific timetable for actual development of these future housing units; associated buildout years identified in this study are based solely on current growth trends.) This total amount – which equals 8.6% of the total number of existing units – of expected new residential development is based almost entirely on the housing elements of all 12 land use authorities in Marin County and specific to zoning assignments as it applies to the six affected agencies' jurisdictional boundaries.

It is anticipated a total of 8,810 new housing units – producing a projected 28,728 additional residents – may be constructed within the six affected agencies' jurisdictions at buildout based on current land use policies.

With respect to impacts on individual agencies and their service areas, slightly more than 80% – or 7,230 – of the planned new housing units are expected to be constructed within MMWD with over three-fourths of this amount lying in the District's 10 cities/towns. The remaining 20% of new housing development is largely dedicated to NMWD's Novato system – 889 units – with the rest scattered relatively evenly among the five West Marin systems. The cumulative effect of the new housing would be the addition of 28,728 new residents; an increase of 11% over current population estimates.

Residential Trends / Agencies								
Table 3-4 (Marin LAFCO)								
Type	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt Reyes St.	Total
Existing Units	650	616	157	223	76,411	22,384	1,847	102,288
New Units at Buildout	75	74	10	60	7,230	889	472	8,810
- New Units as %	11.5%	12.0%	6.4%	21.2%	9.5%	4.0%	25.6%	8.6%
Buildout Units:	725	690	167	283	83,641	23,299	2,319	111,099
	West Marin				East Marin		West Marin	

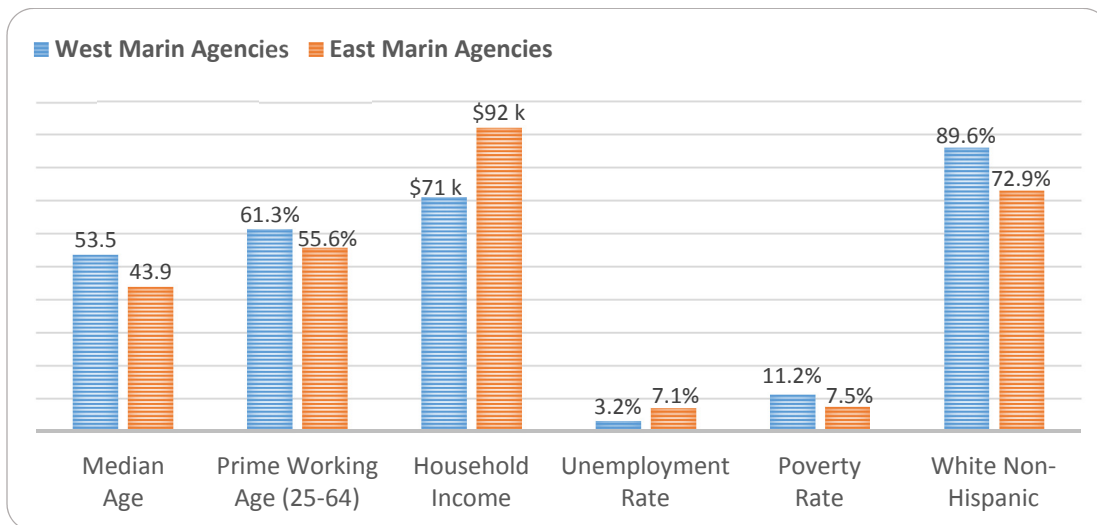
Notes to Table 3-4

1. The listing of residential units at buildout within each affected agency is based on a review of the applicable adopted housing elements of the 12 land use authorities in Marin County as of date. More detailed explanations are provided within the agency profiles prepared for each affected agency.

D. Demographics / Social and Economic Factors

A review of demographic information available for residents within the seven service areas of the six affected agencies identifies marked distinctions between West and East Marin.²² This includes existing and increasing differences in economic and social factors that directly affect the ability and means for the residents/ratepayers to fund water systems, such as median age, household income, and income potential. Specifically, these differences collectively shows growing challenges for West Marin as illustrated below.

Current demographic information shows marked differences between East and West Marin with increasing challenges for the latter residents' ability to fund water operations and improvements in the long-run given relative advanced age, low household incomes, and higher poverty rates.



Social and Economic Characteristics / Region

Additional discussion on key regional and subregional social and economic distinctions follows along with an agency breakdown in the succeeding table.

- Graying in West Marin

Residents in the five West Marin service areas are measurably older than their counterparts in the two East Marin service areas with a 22% separation in the median age totals of 53.5 and 43.9, respectively. This separation is also increasing with the median age rising by 6.9% over the prior five-year period in West Marin compared to only 0.7% in East Marin.

²² Most recent census data reviewed as part of this study is for the 2013 calendar year.

- Widening Economic Gap Favoring East Marin
Residents in the two East Marin service areas have 30% higher median household incomes at \$92,833 compared to \$71,028 in the five West Marin service areas. The disparity is also widening with household incomes in the East Marin service areas increasing by 3.4% over the prior five-year period while decreasing by (7.2%) in the West Marin service areas. Further, and paradoxically, this disparity exists despite the West Marin service areas having a lower unemployment rate and a higher percentage of residents within the prime workforce age (25 to 64) compared to the East Marin service areas.
- Quality of Life Differences
Residents in the five West Marin service areas have collectively experienced nearly a one-half increase in poverty rates over the prior five-year period with the current total at 11.2% and is one-third higher than the two service areas in East Marin. There is also a difference in racial diversity between the two regions with West Marin being 86% white/non-hispanic compared to 73% in East Marin.
- Subregional Distinctions
 - A distinct economic division exists within West Marin as the two most southern agencies – MBCSD and SBCWD – generally serve affluent households relative to countywide averages with no to little unemployment or poverty. This contrasts with the three northern agencies – BCPUD, IPUD, and NMWD (Point Reyes Station) – in the region in which constituents’ median household incomes fall significantly below countywide averages with higher and rising poverty.
 - A similar economic division exists in East Marin where MMWD residents have increasingly higher median household incomes as well as more formal education by one-fourth more compared to NMWD-Novato.

Social and Economic Characteristics / Agencies

Table 3-5 (Marin LAFCO / American Communities Survey)

Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt Reyes St.
Economic Median Age	48.3	60.0	53.7	54.9	44.1	43.5	51.6
Prime Working Age	76.9%	58.1%	87.4%	56.5%	55.4%	56.3%	50.0%
Median HH Income	\$54,635	\$52,135	\$169,063	\$88,750	\$97,400	\$79,664	\$58,258
Unemployment Rate	7.4%	2.0%	0.0%	0.0%	6.9%	7.4%	4.6%
Social Poverty Rate	26.7%	15.1%	0.0%	3.6%	7.6%	7.4%	6.1%
4-Yr College Degree	27.2%	53.2%	82.1%	64.3%	59.3%	44.5%	54.1%
White Non-Hispanic	86.6%	88.6%	94.2%	96.4%	73.7%	70.7%	71.1%
	West Marin			East Marin		West Marin	

E. Jurisdictional Boundaries

The jurisdictional boundaries of the six affected agencies responsible for providing potable water services in Marin County collectively span 265.4 square miles and accounts for 51.1 % of the entire county boundary. MMWD is the single largest of the six agencies in terms of jurisdiction with 148 square miles and represents more than one-half of the combined six-agency total. Population density ratios range from a low of 196 residents for every square mile in SBCWD to a high of 1,255 residents for every square mile in MMWD

Totaled assessed value for the six affected agencies' jurisdictional lands equals \$41.7 billion and represents 70% of the countywide valuation total.

as of the term of the study period. Totaled assessed value (land and structure) for all jurisdictional lands equals \$41.7 billion and represents 70% of the current countywide property tax valuation.²³ (Amount excludes IPUD given it also lies in NMWD.)

Jurisdictional Lands / Agencies

Table 3-6 (Marin LAFCO / MarinMap)

Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD
Total Square Miles	2.6	2.2	1.3	10.0	148.2	101.1
Density (Residents per Square Mile)	605.4	625.0	331.5	195.7	1,255.4	641.4
Total Assessor Parcels	1,168	755	187	941	66,387	23,236
Assessed Value (Land and Structure)	\$278.4 m	\$244.8 m	\$121.4 m	\$400.4 m	\$29.8 b	\$11.1 b
Assessed Value Per Resident	\$0.176 m	\$0.178 m	\$0.276 m	\$0.204 m	\$0.160 m	\$0.171 m

West Marin

East Marin

3.2 POTABLE WATER SYSTEMS

A. Supplies

1.0 Overall / Maximum Conditions

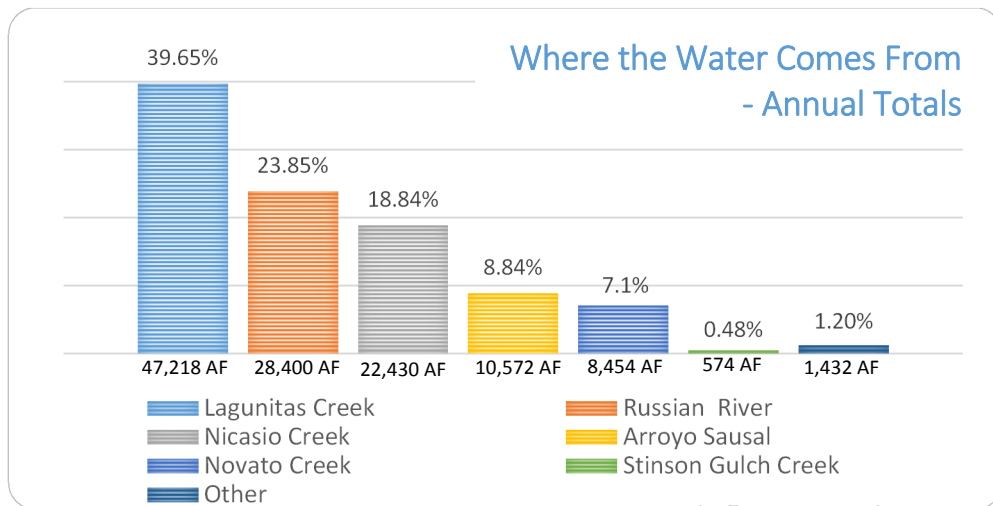
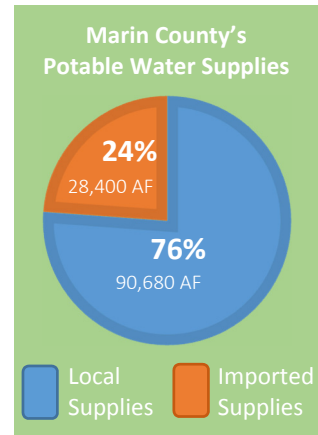
The six affected agencies providing potable water collectively have established 17 distinct supply sources in serving their seven service areas and combined estimated resident service population of 256,230. The Commission estimates these 17 distinct supply sources – which are 99% tied to surface sources with the remaining 1% tied to groundwater – jointly provides the affected agencies with access up to a maximum annual amount of 38.8 billion gallons or 119,080 acre-feet with pumping and/or permit restrictions considered. This

The Commission estimates the six affected public agencies collectively have access to a maximum annual amount of 119,080 acre-feet of potable water supplies. This total amount produces a maximum daily resident allowance of 415 gallons.

²³ The State Controller's Office reports Marin County's total secured assessed property tax valuation in 2013-2014 equaled \$58.9 billion. (State Controller's Assessed Valuation Annual Report, 2013-2014)

maximum estimated amount produces a corresponding per capita use allowance of 415 gallons. Further, and of the total amount estimated to be available to the affected agencies, over three-fourths are drawn from local supplies originating in Marin County.

Almost two-thirds of the total estimated maximum potable supply available to the six affected agencies is tied to two sources: Lagunitas Creek and Russian River. Lagunitas Creek serves as the single largest potable source and is largely generated by direct runoff from Mount Tamalpais. Lagunitas Creek independently accounts for 39.7% of all available potable supplies and estimated to provide up to a maximum of 15.4 billion gallons or 47,218 acre-feet annually to MMWD and NMWD (Point Reyes Station). Russian River serves as the second largest potable source and accounts for 23.9% of all established supplies and primarily generated by runoff and creek diversions along its name-sake watershed that extends into Mendocino County. Russian River water is accessed by MMWD and NMWD-Novato through separate contracts and can jointly provide up to estimated 9.2 billion gallons or 28,400 acre-feet annually to the two agencies.



Top Potable Water Supply Sources in Marin County
amounts in acre-feet (af)

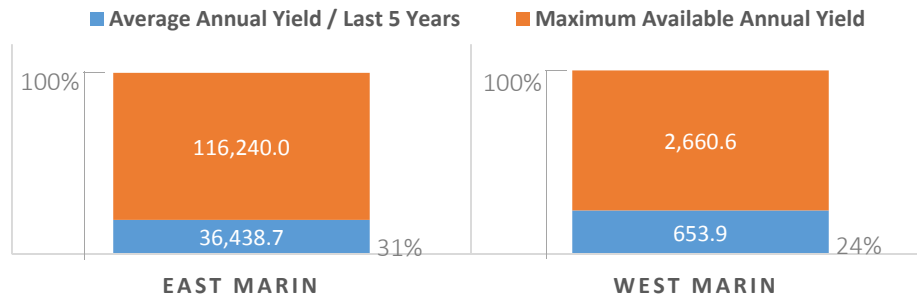
The six affected agencies' combined average yield of raw potable supplies accessed over the study period has been 12.1 billion gallons or 37,015 acre-feet. This combined total – which includes all diversions and/or pumping totals prior to treatment production – equals 31.1% of the total amount potentially available to the affected agencies under maximum/normal conditions.

The combined average annual yield taken by the six affected agencies prior to treatment production over the study period has been equal to 31.1% of the maximum yield jointly available to the agencies.

Individual agencies' high-year yields were spread out over the over the study period with a resulting combined total of 12.8 billion gallons or 39,467 acre-feet; an amount exceeding the average annual yield by 6.6%.

Regional Water Yields

Amounts are in Acre Feet



2.0 Agency Sources / Maximum Conditions

Bolinas Community Public Utility District

BCPUD's potable supplies are all generated from local surface sources with the majority drawn from the Arroyo Hondo Creek.²⁴ An unnamed stream provides supplemental supplies to as needed. It is estimated BCPUD's maximum annual available yield from all existing sources is estimated at 167 acre feet. BCPUD's average yield drawn over the study period has been 114.0 acre-feet. The single-highest year-end use occurred in 2013 when BCPUD collectively drew 127.3 acre-feet; an amount that exceeded the average annual take by more than 10%.²⁵

BCPUD's maximum annual potable water supply yield is estimated by the Commission at 167.0 acre-feet. The average yield drawn over the study period has been 114.0 acre-feet.

Inverness Public Utility District

IPUD's potable water supplies are all locally sourced and drawn from multiple surface and groundwater sites with the principal sources being First, Second, and Third Valley Creeks.²⁶ It is estimated IPUD's maximum available yield from all of existing sources is 526 acre feet. IPUD's average yield drawn over the study period has been 73.42 acre-feet. The single-

IPUD's maximum annual potable water supply yield is estimated by the Commission at 526.2 acre-feet. The average yield drawn over the study period has been 73.4 acre-feet.

²⁴ BCPUD's potable water supplies are secured by multiple post 1914 appropriated permits rights with SWRCB.

²⁵ BCPUD notes the 2013 use was highly unusual and the result of extensive flushing needed as part of the installation of a major water main replacement project as well as several significant leaks on the distribution system; all of which the District reports were addressed by the end of 2013.

²⁶ IPUD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB.

highest year use over this period occurred in 2012 when IPUD collectively drew 75.8 acre-feet; an amount that exceeded the average annual take by close to one-twentieth.²⁷

Muir Beach Community Services District

MBCSD's potable water supplies are all locally sourced and drawn from two separate groundwater sites accessing underflow from Redwood Creek.²⁸ It is estimated MBCSD's maximum annual available yield is 50.6 acre feet. MBCSD's average yield or take over the study period has been 26.48 acre-feet. The single-highest year-end use occurred in 2012 when MBCSD drew 28.87 acre-feet; an amount exceeding the average annual take by close to one-tenth.

MBCSD's maximum annual potable water supply yield is estimated by the Commission at 50.6 acre-feet. The average yield drawn over the study period has been 26.5 acre-feet.

Stinson Beach County Water District

SBCWD's potable supplies are locally sourced and drawn from both surface water and groundwater with Stinson Gulch Creek being the single principal source.²⁹ It is estimated SBCWD's maximum annual available yield from all existing sources is 1,262 acre-feet. The average yield drawn over study period has been 68.8 acre-feet. The single-highest year-end use occurred in 2011 when SBCWD collectively drew 74.0 acre-feet; an amount exceeding the average annual take by close to one-tenth.³⁰

SBCWDs maximum annual potable water supply yield is estimated by the Commission at 1,262.0 acre-feet. The average yield drawn over the study period has been 68.8 acre-feet.

Marin Municipal Water District

MMWD's potable supplies are drawn from a combination of local and imported sources with the former generally accounting for three-fourths of annual uses and principally tied to Lagunitas Creek.³¹ It is estimated MMWD's maximum annual available yield from all existing sources is 93,866 acre-feet. MMWD's average yield over the study period has been 26,521.4 acre-feet. The

MMWD's maximum annual potable water supply yield is estimated by the Commission at 93,866 acre-feet. The average yield drawn over the study period has been 26,521 acre-feet.

²⁷ IPUD has also exercised its annual permit right over the same five year period to draw close one-quarter or 6.0 acre-feet of its allocation from its two lower elevation diversion points along First and Second Valley while groundwater extraction has been limited.

²⁸ MBCSD's potable water supplies to underflow from Redwood Creek are secured through a post-1914 appropriated right permit with SWRCB.

²⁹ SBCWD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB.

³⁰ SBCWD has also pumped on average over the same period 21.877 million gallons or 67.1 acre-feet in groundwater from its four sites. Average groundwater use covers only 2012 through 2009.

³¹ MMWD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB as well as a contract with SCWA.

single-highest year-end use occurred in 2009 when MMWD collectively drew 27,807 acre-feet; an amount exceeding the average annual take by 5.0%.

North Marin Water District – Novato System

NMWD's potable water supplies for the Novato system are drawn from a combination of local and imported sources with the latter generally accounting for three-fourths of annual uses and tied to the Russian River.³² It is estimated NMWD's maximum annual available yield from all existing sources for the Novato system is 22,554 acre-feet. The average yield drawn over

NMWD's maximum annual potable water supply yield for the Novato system is estimated by the Commission at 22,554 acre-feet. The average yield drawn over the study period has been 9,918 acre-feet.

the study period from all existing sources has been 9,917.7 acre-feet. The single-highest year-end use occurred in 2009 when NMWD collectively drew 10,921 acre-feet; an amount exceeding the average annual take by more than one-tenth.

North Marin Water District – Point Reyes Station

NMWD's potable water supplies for the Point Reyes Station system are drawn entirely from direct surface and indirect groundwater flows from Lagunitas Creek.³³ It is estimated NMWD's maximum annual available yield from this source for the Point Reyes Station system is 654 acre-feet. The average yield drawn over the study period has been 293 acre-feet. The single-highest year-end use occurred in 2009

NMWD's maximum annual potable water supply yield for the Point Reyes Station system is estimated by the Commission at 654 acre-feet. The average yield drawn over the study period has been 293 acre-feet.

when NMWD collectively drew 432.7 acre-feet; an amount that exceeded the average five-year annual amount by more than two-thirds.

3.0 Overall Sources / Projected Drought Conditions

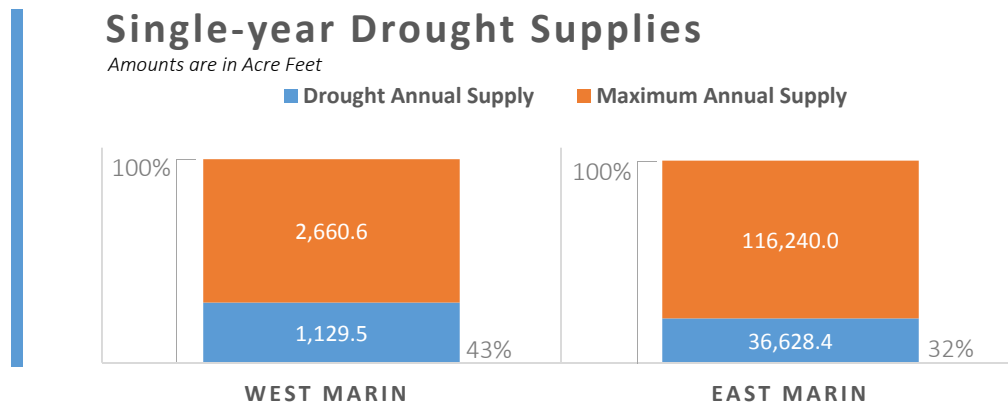
The Commission estimates an overall reduction of 68.3% in the maximum annual water supply collectively available to the six affected agencies and their seven service areas during single-dry year drought conditions. This projection – which reduces overall annual potable supplies from 119,080 to 37,756 acre-feet – incorporates regional reductions for East Marin and West Marin agencies of 68.5% and 57.6%, respectively, and produces a maximum per capita day allowance of 132

The Commission estimates the six affected public agencies will collectively experience a 68% decrease in available potable supplies during a significant dry-year drought consistent with the 1977 water year.

³² NMWD's potable water supplies for the Novato system are secured by post 1914 appropriated permits with SWRCB as well as through a contract with SCWA.

³³ NMWD's potable water supplies for the Point Reyes Station system are secured by post 1914 appropriated permit rights with SWRCB.

gallons. The reductions are drawn from the Commission’s own calculations performed for all five West Marin systems coupled with MMWD and NMWD’s own projections for their systems in East Marin. Both calculations – those performed by the Commission and those performed by MMWD and NMWD – are based on using the 1977 water year as the baseline determinant in projecting drought totals.



4.0 Agency Sources / Drought Conditions

Bolinas Community Public Utility District

No formal analysis has been performed by BCPUD with respect to quantifying the District’s potable water supply reliability during different hydrological periods. It appears reasonable, nevertheless, to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to BCPUD for planning purposes. With this in mind, the Commission independently projects BCPUD’s water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77

The Commission projects an overall decrease of BCPUD’s annual potable supplies from 167 to 104 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **38%** overall decrease in supplies relative to the maximum yield available to BCPUD.

drought.³⁴ The substantive effect of applying this single dry-year drought projection is BCPUD’s annual water supply being reduced from its normal/maximum level of 167 acre-feet to 103.5 acre-feet; a net difference or loss of (63.5) acre-feet.

³⁴ State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 76% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale BCPUDs supplies are permitted and already incorporate a baseline reduction in total flows in Arroyo Hondo Creek and the unnamed streams.

Inverness Public Utility District

IPUD performed an assessment of its water supplies in 1982 following the year's earlier storm event and as part of a system needs evaluation. No update to this analysis has been performed to date. Accordingly, and for purposes of this planning document, it appears reasonable to assume some significant level of curtailment will occur during dry periods reducing the overall supply available to IPUD. With this in mind, the Commission independently projects IPUD's primary water supply sources and groundwater being curtailed up to 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The remainder of IPUD's supply sources are also curtailed, though at a lesser extent – up to 38% – based on a modified calculation as described in the accompanying footnote.³⁵ The substantive effect of applying this drought curtailment projection is IPUD's annual water supply being reduced from its normal/maximum level of 526.2 acre feet to 135.98 acre-feet; a net difference or loss of (390.2) acre-feet.

The Commission projects an overall decrease of IPUD's annual potable supplies from 562 to 134 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **76%** overall decrease in supplies relative to the maximum yield available to IPUD.

Muir Beach Community Services District

No formal analysis has been performed by MBCSD in recent years with respect to quantifying the District's water supply reliability during different hydrological periods. However, it appears reasonable to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to MBCSD for planning purposes. With this in mind, the Commission independently projects MBCSD's water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The substantive effect of applying this drought projection is MBCSD's annual water supply being reduced from its normal/maximum level of 50.60 acre feet to 31.4 acre-feet; a net difference or loss of (19.2) acre-feet.

The Commission projects an overall decrease of MBCSD's annual potable supplies from 51 to 31 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **38%** overall decrease in supplies relative to the maximum yield available to MBCSD.

³⁵ LAFCO has adjusted this curtailment upwardly to 38% for IPUD's permitted water supplies given these sources already incorporate a baseline reduction in total flows through a permit process managed by the State Water Resources Control Board.

Stinson Beach County Water District

SBCWD evaluated the reliability of its water supplies with the voluntary preparation of an Urban Water Management Plan (UWMP) in 2006 and orients the District to anticipate an overall reduction of more than one-half in its available supplies during single dry-year drought conditions and resulting in supplies decreasing from 1,262.8 acre-feet in normal years to 698.1 acre-feet in single-dry years; a net loss of (564.7) acre-feet or (55%). While SBCWD has prepared its own supply projections for dry year conditions, the Commission believes it is appropriate to apply a further conservative reduction in supplies for purposes of planning tied to this review. This

The Commission projects an overall decrease of SBCWD's annual potable supplies from 1,263 to 298 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **76%** overall decrease in supplies relative to the maximum yield available to SBCWD.

involves applying a flat curtailment to all water (surface and groundwater) sources of 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The substantive result of applying this reduction in SBCWD's available annual water supply is a decline from 1,262.8 acre-feet in normal years to 298.07 acre-feet in drought year conditions; a net difference or loss of (964.7) acre-feet.

Marin Municipal Water District

MMWD's most recent update to its UWMP was issued in 2011 and orients the District to anticipate an overall reduction of nearly three-fourths in its available supplies during single-dry year drought conditions. This includes MMWD calculating specific reductions in single-dry year periods equaling 46.9% in its primary water sources (local surface) and 76.8% in its secondary source (Russian River) relative to normal/maximum conditions; the end and

MMWD projects an overall decrease in annual potable water supplies from 93,866 to 26,134 acre-feet during a significant drought year event. This projection represents a **72%** decrease in supplies relative to the maximum yield available to MMWD.

cumulative result being that total supplies reduce from 93,866 to 21,626 acre-feet and a net loss of (72,240) acre-feet. These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by the Commission for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

North Marin Water District - Novato

NMWD's most recent update to its UWMP was issued in 2011 and is specific to the Novato system. This document orients NMWD to anticipate an overall reduction of nearly one-half of its potable water supplies during single dry-year drought conditions with totals decreasing from 22,454 acre-feet to 10,494 acre-feet; a net difference of (12,060) acre-feet or (46.7%). This includes NMWD calculating specific reductions, relative to maximum conditions, of 43.3% in its primary water source (Russian River) and 70.4% in its secondary source (Novato Creek). These planning reductions appear sufficiently justified

and correspond with the curtailment estimates made separately by the Commission for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

NMWD projects an overall decrease in annual potable water supplies from 22,454 to 10,494 acre-feet during a significant drought year event. This projection represents a **47%** decrease in supplies relative to the maximum yield available to NMWD.

North Marin Water District - Point Reyes Station

No formal analysis has been performed by NMWD to quantify the District's water supply reliability for the Point Reyes Station system during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some level of curtailment will occur during extended dry periods reducing the overall supply available to NMWD. With this in mind, the Commission independently projects the overall water supply being reduced up to 14.3% during single-dry years. This reduction aligns with a modification to the present-day production loss

calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought and detailed in the accompanying footnote.³⁶ The substantive effect of this drought projection is NMWD's annual water supply for the Point Reyes Station system being reduced from its normal/maximum level of 654.0 acre feet to 560.5 acre-feet; a net difference or loss of (93.5) acre-feet.

The Commission projects NMWD's annual potable water supplies for the Point Reyes Station system declining by **14%** from 654 to 561 acre-feet during significant single dry-year; a decline amount that is lessened by the addition of dry-year flows from MMWD.

³⁶ State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 74% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale NMWD's supplies are already incorporate a baseline reduction in total flows in Lagunitas Creek. This assumption also applies to a 38% reduction in the 250 acre-feet of dry-year summer supplies from MMWD.

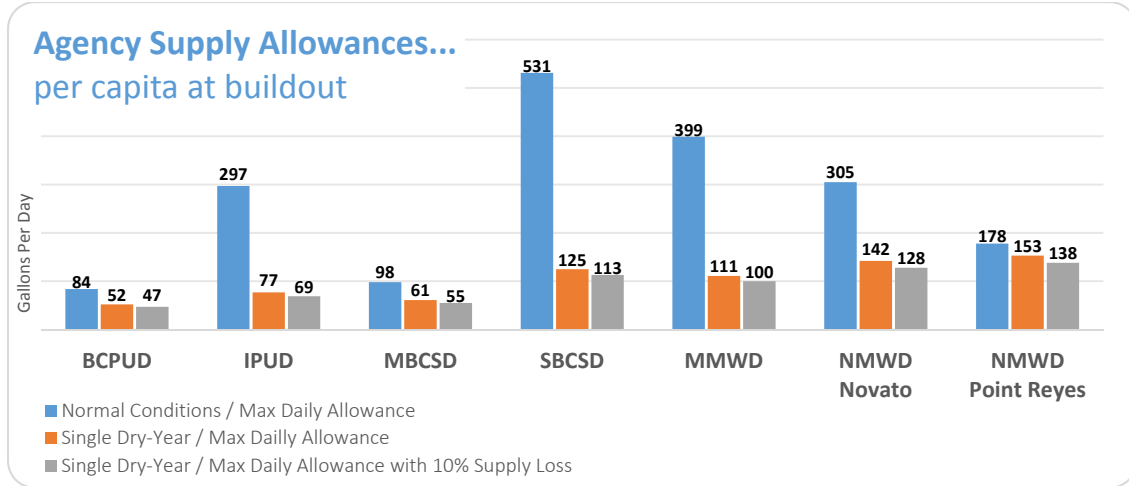
Potable Water Supply Availability and Reliability / Agencies					
Table 3-7 (Marin LAFCO)					
	Convey Day Max To Treatment	Convey Annual Max To Treatment	76-77 Drought Day Max To Treatment	76-77 Drought Annual Max To Treatment	
Agency	What is Accessible - normal/max conditions -		What is Accessible - single dry-year conditions -		
West Marin	BCPUD	1.09	167.00	0.68	103.50
	IPUD	2.70	526.20	1.22	135.90
	MBCSD	0.14	50.60	0.04	31.40
East Marin	SBCWD	3.45	1,262.80	0.82	298.07
	MMWD	230.80	93,866.00	68.90	26,134.00
	NMWD – Novato	86.94	22,554.00	43.97	10,493.38
	NMWD – Pt. Reyes	1.86	654.00	1.86	560.50
	Total Yield	326.98	119,080.60	117.49	37,756.75

5.0 Overall and Agency Sources / Maximum Daily Per Capita Allowances at Buildout

The Commission estimates the maximum per capita water allowance among the six affected agencies at their currently projected buildouts is an average of 373 gallons under normal conditions; i.e., an average demand exceeding this amount would produce an overall shortfall. This shared buildout allowance estimate is reduced under projected single-dry year conditions by two-thirds to an average of 118 gallons. The latter estimate is further reduced to an average of 106 gallons with the incorporation of 10% decrease in supplies due to system losses and/or other related factors.

The Commission projects the six affected agencies shared maximum per capita water allowance at buildout under normal and single dry-year conditions is an average of 373 and 118 gallons, respectively; a difference of (68%).

Maximum daily water allowances at buildout varies significantly among the six affected agencies. Under normal conditions the estimated maximum daily capita allowances range from a low of 99 gallons in MBCSD to a high of 530 gallons in SBCWD. Under projected single dry-year conditions the estimated maximum daily capita allowances range from a low of 46 gallons in BCPUD to a high of 137 gallons in NMWD-Point Reyes.



B. Demands

1.0 Overall Demands / Production Trends Over Study Period

The combined average annual potable water demand production (metered and losses) during this **study period** has totaled 12.0 billion gallons or 36,302 acre-feet (see footnote).³⁷ This average amount equals approximately 31% of the maximum accessible yield available to the six affected agencies and produces a per resident daily use of 126 gallons. The single highest demand year occurred in 2013 when the six agencies collectively produced 37,858 acre-feet of potable water within the seven service areas; an amount that is close to 3% higher than the five-year average, and produces a per resident daily usage of 132 gallons. The combined average peak-day demand totals 159 acre-feet and results in a peaking factor of 1.60; or 60% more than average day usage.

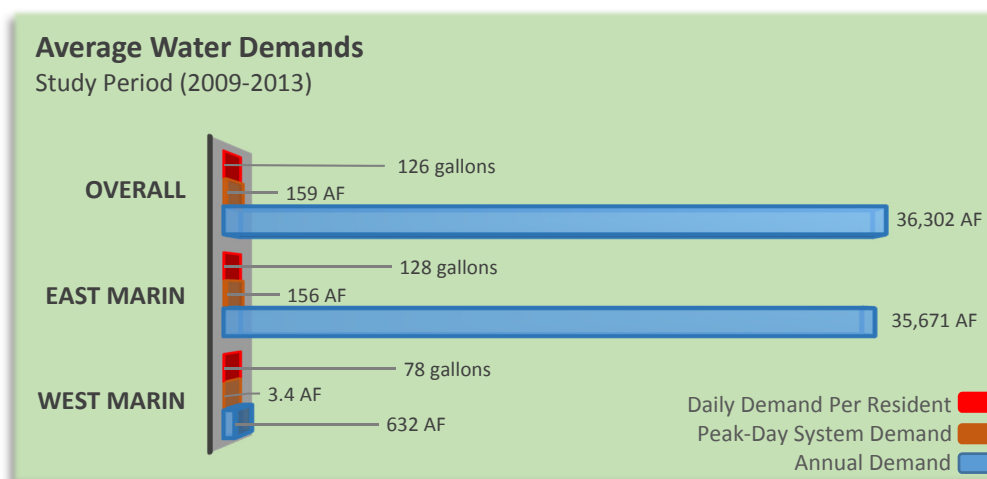
The combined average annual potable water demand production among all six affected agencies has been 36,302 acre-feet over study period. This amount equals 31% of the maximum annual yield available and translates to a per resident daily use of 126 gallons.

Almost 99% – or 35,671 acre-feet – of the average annual potable water production among the six affected agencies during the study period has been generated in the two East Marin service areas (MMWD and NMWD-Novato). The average per resident daily use within East Marin during this period has been 128 gallons while the average peak-

Average daily water demand per resident in the two East Marin service areas over the study period has been 128 gallons. This amount is nearly double the average rate of 77 gallons within the five service areas in West Marin.

³⁷ Demand trends differ based on the data range selected. LAFCO uses a five-year study period to analyze recent system demand trends given it directly aligns with the five-year cycle set under State law to prepare municipal service reviews. The 2009-2013 period covers the five years immediately preceding the start of the study work.

day demand total of 155 acre-feet produces a per capita use of 204 gallons. These amounts differ and are proportionally higher than the averages generated within West Marin’s five service areas where their daily resident use has been 77 gallons and the peak-day demand total of 3.43 acre-feet produces a per capita use of 153 gallons. A notable qualification, nevertheless, exists with respect to comparing peak-day demand averages between East and West Marin where the latter’s peaking factor has been 1.99 versus 1.59 in East Marin through the study period; all of which signals the relative intensity of peak demand periods is higher in West Marin and presumably attributed to tourism impacts.



Countywide Totals / Seven Service Areas	Study Period Averages	Study Period Change
Annual Total (af)	36,302.79	0.02%
Average Day (af)	99.46	0.02%
Connections	84,302.20	1.20%
Per Day Connection (g)	384.52	-1.16%
Per Day Resident (g)	126.30	-0.37%
Peak Day (af)	159.13	-10.10%
Peaking Factor	1.60	-10.12%

East Marin / Two Service Areas	5-Yr Averages	5-Yr Change
Annual Total (af)	35,670.84	0.05%
Average Day (af)	97.73	0.05%
Connections	81,636.80	0.69%
Per Day Connection (g)	390.14	-0.64%
Per Day Resident (g)	127.72	-0.32%
Peak Day (af)	155.7	-10.22%
Peaking Factor	1.59	-10.27%

West Marin / Five Service Areas	5-Yr Averages	5-Yr Change
Annual Total (af)	631.95	-1.65%
Average Day (af)	1.73	-1.65%
Connections	2,665.40	18.88%
Per Day Connection (g)	213.13	-17.27%
Per Day Resident (g)	77.68	-2.61%
Peak Day (af)	3.43	-3.52%
Peaking Factor	1.99	-1.90%

With respect to aggregate trends, and despite increases in the estimated resident populations within nearly all of the affected agencies' service areas, the overall and combined potable water demand production has remained relatively stagnant during the study period. Overall production has increased by only 8.2 acre-feet or 0.02%; an amount that is 20 times less than the corresponding population change. This modest amount of new production – markedly – shows an underlying deintensification in usage and paced by West Marin decreasing demand by (1.65%) compared to East Marin's modest increase of 0.05%. The underlying deintensification in usage is further highlighted in the combined daily resident use average decreasing from 132 to 126 gallons during the affected five year period, a net difference of (0.4%). Overall high-day demands have also decreased by (10.1%) from 172.5 acre-feet to 155.1 acre-feet.

Overall production trends over the study period shows a deintensification in aggregate usage countywide with a rise in demands equaling only 0.02%; an amount 20 times less than the corresponding growth rate among all agencies.

2.0 Agency Demands / Production Trends Over Study Period

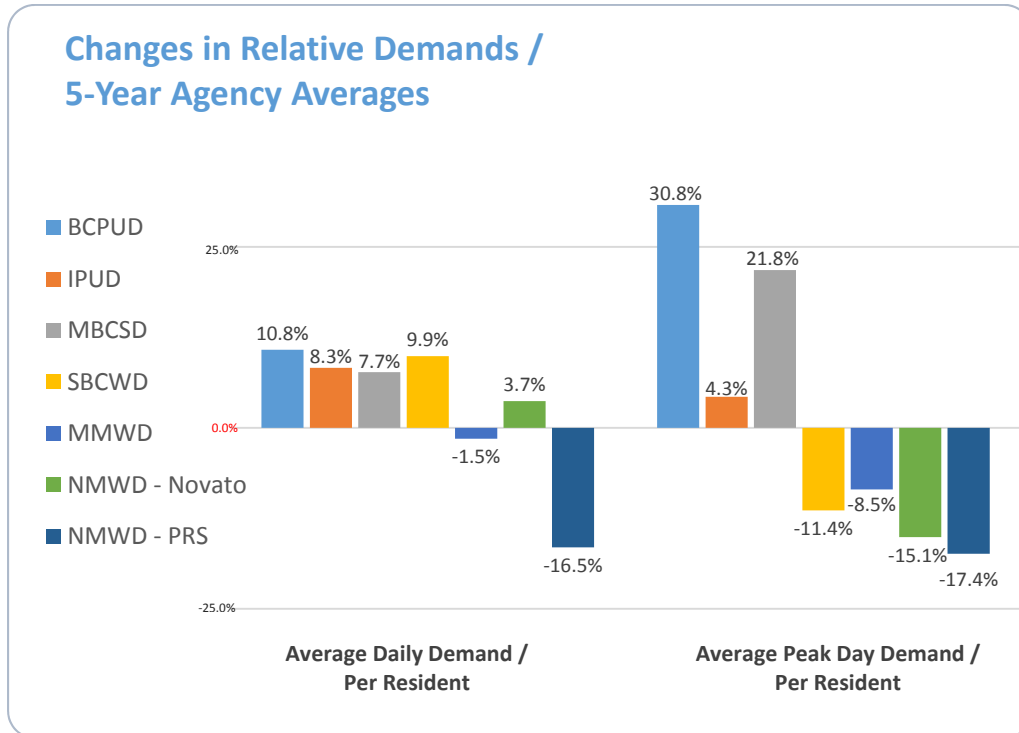
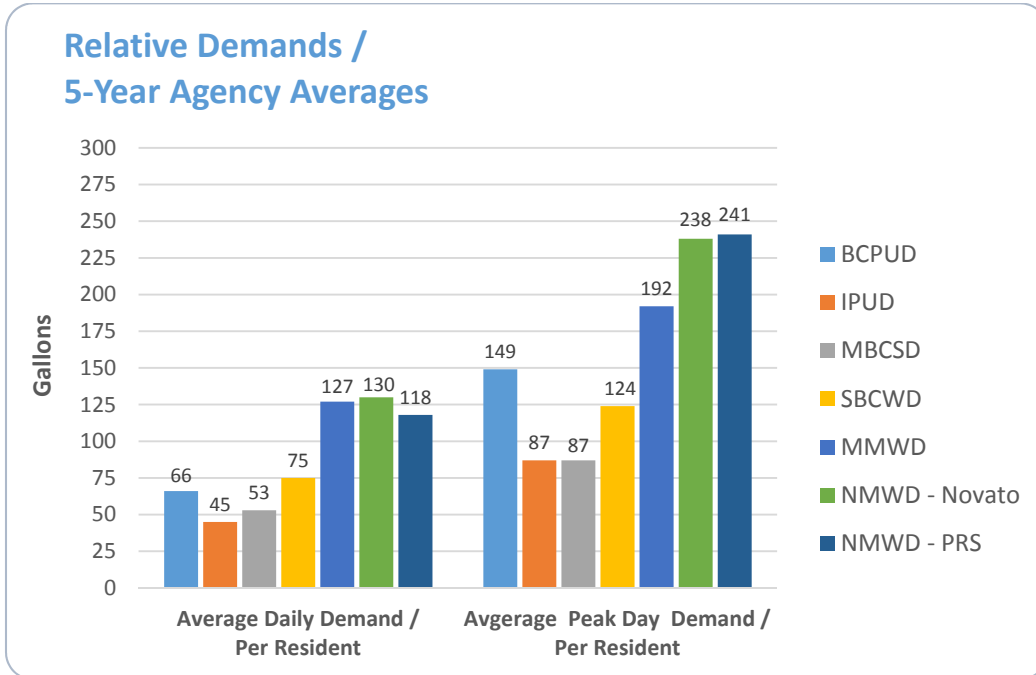
Annual potable water demand production has increased for five of the seven service areas over the study period (see footnote 37). The increases in overall demand has ranged from a low of 3.8% in NMWD-Novato to a high of 11.4% in BCPUD and most pronounced in West Marin with four of the five service areas' totals on the rise. Only MMWD and NMWD-Point Reyes Station experienced decreases in average annual demands over the study period with the latter directly attributed to the closure of a large commercial dairy customer in 2010.

Annual demands have been rising for most of the agencies with five of the seven service areas experiencing increases in overall water production over the study period.

As noted, relative demand – i.e., agency production measured by residents or capita – during the study period shows a marked regional distinction with uses significantly higher in East Marin compared to West Marin. The daily per capita demand in East Marin during the study period essentially matched with MMWD at 127 gallons and NMWD-Novato at 130 gallons. The daily per capita demand in West Marin during the study period was more varied with a low of 45 gallons in IPUD and a high of 118 gallons in NMWD-Point Reyes Station. Further, and markedly, all five service areas experiencing increases in their relative demand over the study period – and specifically BCPUD, IPUD, MBCSD,

Five of the seven service areas – BCPUD, IPUD, MBCSD, SBCWD, and MMWD – experienced increases in their relative water demands and at a rate exceeding their respective population change during the study period; a dynamic suggesting system usage – and not growth – is driving new demands.

SBCWD, and MMWD – did so at a rate that exceeded their corresponding change in population over the five-year period; all of which suggest an intensity in usage – and not development – underlies the new demand on water.



Bolinas Community Public Utility District

BCPUD’s average annual potable water production demand has been 37.8 million gallons or 115.9 acre-feet through study period. The most recent completed year showed total demand/production at 41.5 million gallons or 127.4 acre-feet. This most recent amount represents an average daily water demand for the entire distribution system of 0.113 million gallons or 0.35 acre-feet; an amount that is further broken down to 194 gallons per day for every service connection. Per capita use has similarly increased with a five-year average of 66 gallons.

BCPUD’s overall average annual water demand production during the study period has been 116 acre-feet and translates to a daily per resident take of 66 gallons. Annual demands have increased by 11% with an average peaking-factor of 2.0. The increase in usage contrast with the existing moratorium that has precluded any estimated new residents.

The peak-day demand – the highest one day sum for the affected year – totaled 0.217 million gallons or 0.68 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.92. Overall BCPUD has experienced a total increase of 11.4% in water demand production over the five-year period or 2.3% annually and largely attributed to a sharp rise in usage between 2012 and 2013 due to system flushing; demands over the preceding four-year period were largely stagnant from one year to the next.

BCPUD’s Water Demand Production				
Table 3-8 (BCPUD / Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	114.4	127.4	115.8	11.4%
Average Day	0.31	0.35	0.36	12.9%
Connections	587	587	584	0.0%
Per Day Connection	174g	194g	176 gallons	11.5%
Per Day Resident	65g	72g	66 gallons	10.8%
Peak Day	0.52	0.68	0.72	31.8%
Peaking Factor	1.67p	1.94p	2.0 peaking	16.2%

- Amounts in Acre Feet Unless Otherwise Noted

Inverness Public Utility District

IPUD’s average annual water production demand has been 23.2 million gallons or 71.2 acre-feet through the study period. The most recent completed year showed total demand at 26.0 million gallons or 79.78 acre-feet. This recent amount represents an average daily water demand for the entire distribution system of 0.071 million gallons or 0.22 acre-feet; an amount that is further broken down to 139 gallons per day for every service connection. Per capita use has similarly increased relative to per connections with a five-year average of 45 gallons. The peak-

IPUD’s overall average annual water demand production during the study period has been 71 acre-feet and translates to a daily per resident take of 45 gallons. Annual demands have increased by 8% with an average peaking-factor of 1.95. The increase in usage is more than two times greater than the corresponding estimated growth rate for the service area.

day demand – the highest one day sum for the affected year – totaled 0.137 million gallons or 0.42 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.91. Overall IPUD has experienced an overall increase of 8.4% in water demands over the five-year review period or 1.7% annually and largely attributed to a sharp rise in usage between 2012 and 2013. This overall increase exceeds the estimated population growth within IPUD by over a factor of two and suggests land use intensification is driving new usage given actual new development has been limited to three new connected residences.

IPUD’s Water Demand Production				
Table 3-9 (IPUD / Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	73.6	79.8	71.2	8.4%
Average Day	0.20	0.22	0.19	8.4%
Connections	506	509	508	0.6%
Per Day Connection	130g	139g	125 gallons	6.9%
Per Day Resident	48g	52g	45 gallons	8.3%
Peak Day	0.40	.42	0.37	5.0%
Peaking Factor	2.0p	1.91p	1.95 peaking	(4.5%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

Muir Beach Community Services District

MBCSD’s average annual water production demand has been 8.2 million gallons or 25.37 acre-feet through the study period. The most recent completed year showed total demand at 8.7 million gallons or 26.93 acre-feet. This most recent amount represents an average daily water demand for the entire system of 24,048 gallons or 0.074 acre-feet; an amount that is further broken down to 151 gallons per day for every service connection. Per capita use has similarly increased relative to per connections with a five-year average of 53 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.122 acre-feet and was nearly two-thirds greater than the annualized daily average and results in a peaking factor of 1.66. Overall MBCSD has experienced an increase of 8.8% in potable water demands over the five-year period or 1.76% annually. This overall increase outpaces the estimated population change by four-fold and appears largely attributed to the intensification of existing uses.

MBCSD’s overall average annual water demand production during the study period has been 27 acre-feet and translates to a daily per resident take of 53 gallons. Annual demands have increased by 9% with an average peaking-factor of 1.67. The increase in usage is more than four times greater than the corresponding estimated growth rate for the service area.

MBCSD's Potable Water Demands				
Table 3-10 (MBCSD /Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	24.76	26.93	25.37	8.8%
Average Day	0.068	0.074	0.0696	8.8%
Connections	156	159	158	1.9%
Per Day Connection	142g	151g	144 gallons	6.3%
Per Day Resident	52g	56g	53 gallons	7.7%
Peak Day	0.098	0.122	0.116	24.5%
Peaking Factor	1.44p	1.66p	1.67 peaking	15.3%

- Amounts Shown in Acre Feet Unless Otherwise Noted

Stinson Beach County Water District

SBCWD's average annual water production demand has been 53.7 million gallons or 164.8 acre-feet through the study period. The most recent completed year showed a total water demand of 55.6 million gallons or 170.6 acre-feet. This most recent amount represents an average daily water demand for the entire distribution system of 0.152 million gallons or 0.47 acre-feet; an amount that is further broken down to 209 gallons per day for every service connection. Per capita use has similarly decreased relative to per connections with a four year average of 75 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.238 million gallons or 0.73 acre-feet and was exactly double the daily average or a peaking factor of 1.55. SBCWD has experienced an overall change of 9.6% in water demand production over the four-year period covered or 2.4% annually. (Production for 2009 was not available.) The overall increase in water demand production significantly outpaces the corresponding change in estimated population growth – 0.7% – by over ten-fold and suggest demands are largely rising due to the intensification of uses among existing development.

SBCWD's overall average annual water demand production during the study period has been 165 acre-feet and translates to a daily per resident take of 75 gallons. Annual demands have increased by 10% with an average peaking-factor of 1.67. The increase in usage is more than 10 times greater than the corresponding estimated growth rate for the service area.

SBCWD's Water Demand Production				
Table 3-11 (SBCWD /Marin LAFCO)				
Category	2010	2013 -baseline-	4-Year Average	4-Year Change
Annual Total	155.7	170.7	164.8	9.6%
Average Day	0.43	0.47	0.45	9.3%
Connection	724	727	726	0.4%
Per Day Connection	192g	210g	203 gallons	9.4%
Per Day Resident	71g	78g	75 gallons	9.9%
Peak Day	0.82	0.73	0.75	(11.0%)
Peaking Factor	1.91p	1.55p	1.67 peaking	(18.8%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

Marin Municipal Water District

MMWD’s average annual water production demand has been 8.6 billion gallons or 26,521 acre-feet through the study period. The most recent completed year showed total demand at 8.9 billion gallons or 27,403 acre-feet. This most recent amount represents an average daily water demand production for the entire distribution system of 24.4 million gallons or 75.1 acre-feet; an amount that is further broken down to 399 gallons per day for every active service connection. Per capita use has similarly decreased in step with connections with a five-year average of 127 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 106.5 acre-feet and was one-half greater than annualized daily average and results in a peaking factor of 1.53. MMWD has experienced an overall change of (1.6%) in potable water demand production over the five-year period or (0.3%) annually. This decrease has been accomplished irrespective of a corresponding projected increase in service population within MMWD’s distribution system over the same time period of 0.07% annually. The overall decrease in usage appears largely attributed to ongoing investment in conservation and highlighted by rebate programs for high-efficiency plumbing fixtures and offering free consultation visits to implement water-wise uses.

MMWD’s overall average annual water demand production during study period has been 26,521 acre-feet and translates to a daily per resident take of 127 gallons. Annual demands decreased by (1.6%) with an average peaking-factor of 1.51. The decrease in usage contrasts with the corresponding estimated growth rate for the service area.

MMWD’s Potable Water Demands				
Table 3-12 (MMWD / Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	27,807	27,403	26,521	(1.6%)
Average Day	76.2	75.1	72.6	(1.4%)
Connections	60,903	61,391	61,177	0.8%
Per Day Connection	408g	399g	387 gallons	(1.7%)
Per Day Resident	134g	132g	127 gallons	(1.5%)
Peak Day	115.9	106.5	109.6	(8.1%)
Peaking Factor	1.52	1.42	1.51	(6.8%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

North Marin Water District – Novato

NMWD’s average annual water production demand for the Novato system has been 82.9 billion gallons or 9,149.8 acre-feet through the study period. The most recent completed year showed total demand at 3.2 billion gallons or 9,796.4 acre-feet. This most recent amount represents an average daily water demand for the entire Novato system of 8.7 million gallons or 26.8 acre-feet; an amount that is further broken down to 426 gallons per day for every active service connection. Per capita use has similarly increased relative to per connections with a five year average of 130 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 45.4

acre-feet and was over two-thirds greater than annualized daily average and results in a peaking factor of 1.69. The Novato system has experienced an overall change of 3.8% in water demand production over the five-year period or 0.8% annually. This overall change outpaces the projected change in population in the Novato system over the same time period – 0.08% annually – by ten-fold, and appears substantively attributed to weather and economic variations as well as the intensification of uses given the lack of significant new development in the system.

NMWD’s overall average annual water demand production for the Novato system during the study period has been 9,150 acre-feet and translates to a daily per resident take of 130 gallons. Annual demands have increased by 3.8% with an average peaking-factor of 1.84. The increase in usage is more than 10 times greater than the corresponding estimated growth rate for the service area.

NMWD’s Water Demands – Novato				
Table 3-13 (NMWD /Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	9,373.2	9,796.4	9,149.8	3.8%
Average Day	25.7	26.8	25.1	3.8%
Connections	20,416	20,492	20,459	0.4%
Per Day Connection	410g	426g	399 gallons	3.9%
Per Day Resident	134g	139g	130 gallons	3.7%
Peak Day	53.3	45.4	46.1	(14.8%)
Peaking Factor	2.07p	1.69p	1.84 peaking	(18.4%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

North Marin Water District – Point Reyes St.

NMWD’s average annual water production demand for the Point Reyes Station system has been 83.6 million gallons or 256.6 acre-feet through the term of study period. The most recent completed year showed total demand at 82.6 million gallons or 253.7 acre-feet. This most recent amount represents an average daily water demand for the entire Point Reyes Station system of 0.226 million gallons or 0.7 acre-feet; an amount that is further broken down to 291 gallons per day for every active service connection. Per capita use has similarly decreased relative to per connections with a five-year average of 118 gallons. The peak-day demand – the highest day sum – totaled 1.3 acre-feet and was nearly double the annualized daily average and results in a peaking factor of 1.9. The Point Reyes Station system has experienced an overall change of (15.7%) in water demands over the five-year period or (3.2%) annually. This overall change is substantially less than the projected change in population in the Point Reyes Station system over the

NMWD’s overall average annual water demand production for the Point Reyes Station system during the study period has been 257 acre-feet and translates to a daily per resident take of 118 gallons. Annual demands have decreased by (15%) with an average peaking-factor of 1.9. The decrease in usage is more than eight times less than the corresponding estimated growth rate for the service area.

same time period – 0.4% annually – by over eight-fold. This large decrease in usage is tied to the closure of a prominent dairy operation at the beginning of the review endpoints and reflected with uses declining by 20% from 301.1 acre-feet in 2009 to 242.5 acre-feet in 2010.

NMWD’s Water Demands – Point Reyes Station				
Table 3-14 (NMWD /Marin LAFCO)				
Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	301.1	253.7	256.6	(15.7%)
Average Day	0.82	0.70	0.70	(14.6%)
Connections	760	776	770	0.2%
Per Day Connection	352g	294g	294 gallons	(16.5%)
Per Day Resident	140g	117g	118 gallons	(16.4%)
Peak Day	1.46	1.23	1.45	(15.8%)
Peaking Factor	1.8p	1.8p	2.1 peaking	1.6%

- Amounts Shown in Acre Feet Unless Otherwise Noted

3.0 Overall Demands / LAFCO Projections over Next 10 Years

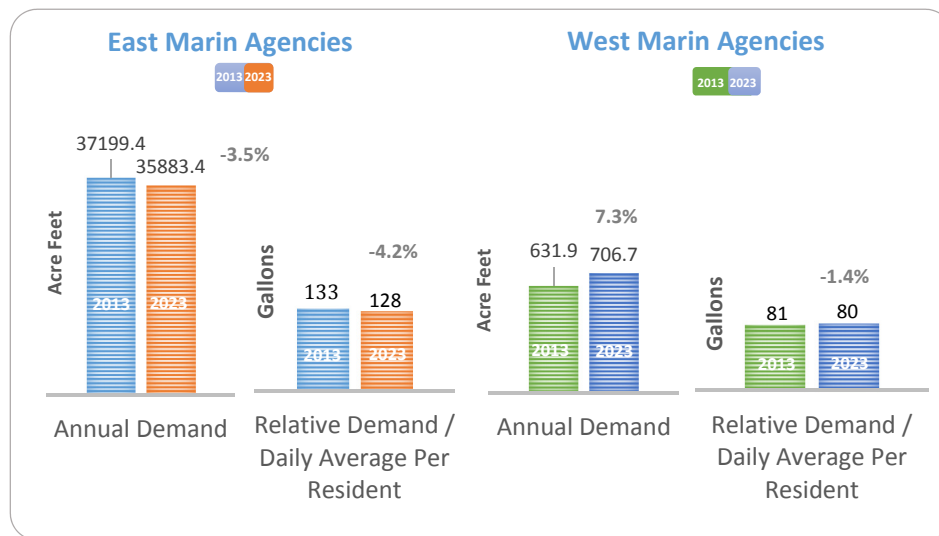
The Commission projects the six affected agencies will collectively experience an overall and combined decrease in demand production of (3.4%) over the next 10-years from the term end of the study period. This projection is based on the Commission’s own regression analyses performed for all seven service areas and would result in the total savings of (1.0) billion gallons or (1,267.8) acre-feet of potable water production by 2023. This overall decrease, pertinently, is projected despite an anticipated resident growth increase of 0.8% by 2023 as well as individual agency increases for four of the seven service areas as detailed in the succeeding sections. The resulting per capita daily demand, accordingly, is expected to be reduced from the baseline year from 131 gallons to 126 gallons over the 10-year period. Overall peak-day demands, however and due to forwarding recent trends therein, are projected to continue to increase the baseline year from 155.1 to 161.5 in 2023; a net change of 4.3%.

The Commission projects an overall aggregate decrease in potable water production among the six affected agencies of (3.4%) with annual totals over the baseline year lowering from 37,858 to 36,590 acre-feet by 2023; a net savings of (1,268) acre-feet. This projection is also reflected in relative demand with the per capita daily usage decreasing from 131 to 126 gallons.

Going forward a dichotomy is projected in which there is overall savings in potable water demand production despite the majority of the individual service areas experiencing increases through 2023. This distinction is highlighted by comparing projected demands among the two regions with East Marin expected to save (1,316.0) acre-feet or (3.5%) of its current baseline usage by 2023

Decreases in projected annual demand production in East Marin is driving overall countywide savings despite anticipated use increases in West Marin.

while West Marin is projected to increase use by 7.3% or 48.2 acre-feet by 2023. A regional comparison follows.



4.0 Agency Demands / LAFCO Projections Over 10 Next Years

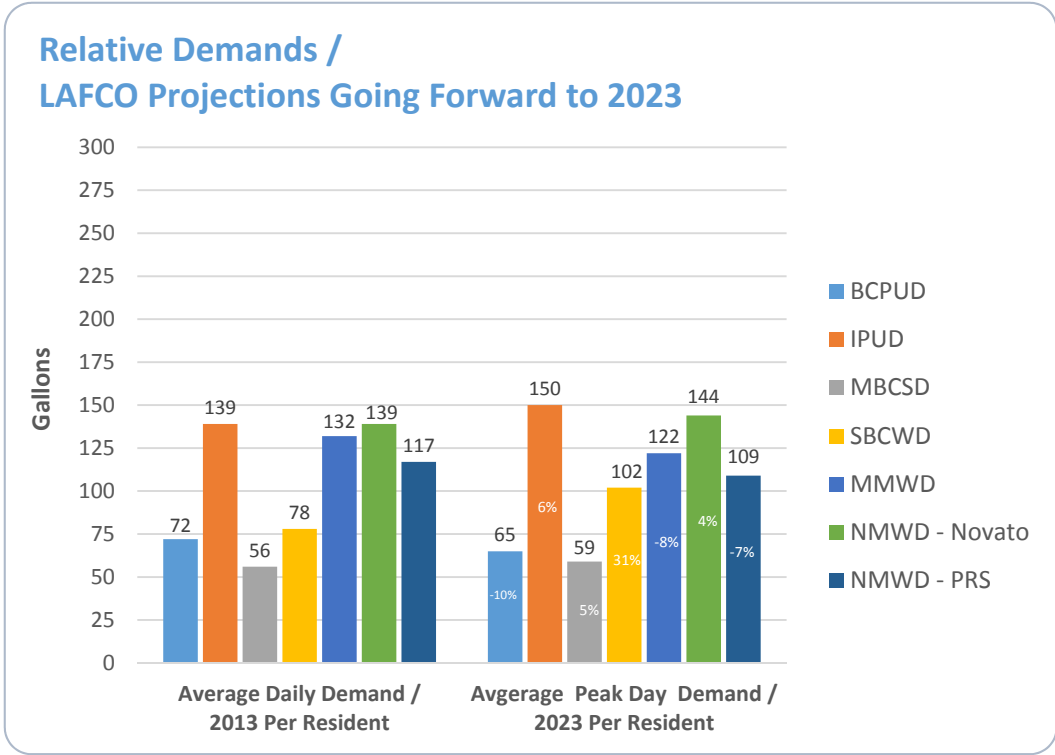
The Commission projects overall annual potable water demand production will increase for four of the seven service areas served by the six affected agencies from the term date of the study period and through the next 10-year period to 2023. These affected agencies and their overall expected increases in potable demand production – which is based on regression analyses tied to the prior five-year totals less noticeable outliers – are SBCWD at 33.4%, MBCSD at 9.7%, IPUD at 8.5%, and NMWD-Novato at 4.5%. These four service areas are on pace to ultimately experience an overall and combined increase in potable demand of 506.2 acre-feet or 5.0% over their shared baseline year totals.

Individual annual demands are expected to increase for four of the seven service areas served by the six affected agencies by collectively 506 acre-feet or 5.0% and involve SBCWD, MBCSD, IPUD, and NMWD-Novato. The remaining three service areas served by MMWD, BCPUD, and NMWD-Point Reyes are expected to experience individual decreases that collectively total (1,774) acre-feet or (6.4%).

Decreases are projected for the remaining three service areas based on the same regression analyses and involve reductions in annual potable water demands for BCPUD at (10.4%), MMWD at (6.4%), and NMWD-Point Reyes at (1.9%). These three service areas are on pace to experience an overall decrease of (1,774) acre-feet or (6.4%).

The Commission projects similar changes in relative demand – i.e., agency production measured by residents – for the seven service areas, though at different and more significant rates compared to estimated annual trends. Relative demand among SBCWD, MBCSD, IPUD, and NMWD-Novato - which are the four service areas expected to incur overall annual increases in potable production – are expected to experience an escalation in their average daily per capita usage by a combined 10.8% over the next 10 year period. This projection is more than double these four service areas’ expected overall annual increase in potable demands, and as such indicates an intensity in usage that exceeds these areas’ anticipated population growth. Relative demand among the other three service areas served by BCPUD, MMWD, and NMWD-Point Reyes Station is projected to decrease with the combined change in average per capita usage lowering by (7.8%). This latter amount is nearly one-fourth greater in terms of savings than the projected decrease in overall annual demands, and as such indicates greater efficiencies going forward with respect to conservation.

It is projected that four of the seven service areas – SBCWD, MBCSD, IPUD, and NMWD-Novato – will experience overall increases in their relative demand (i.e., average daily usage per capita) by a collective total of 10.8% over the next 10-year period, and suggests further intensification of usage that exceeds anticipated growth changes during the period. Savings in relative demand for the other three service areas – BCPUD, MMWD, and NMWD-Point Reyes Station – are projected and indicates greater usage efficiencies going forward within these communities.



Bolinas Community Public Utility District

The Commission projects BCPUD’s overall annual potable demands will revert back to pre-2013 levels and before the recent production spike tied to system flushing and decrease over the baseline year by 13.2 acre-feet or (10.4%) over the next 10-year period. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar decrease in relative demand with per capita usage decreasing by (9.7%) from 72 gallons to 65 gallons by 2023.

LAFCO projects BCPUD’s annual potable demands will decrease over the baseline year by (10.4%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (9.7%); the latter amount reversing direction in recent per capita use trends over the study period.

Projected BCPUD Water Demands			
Table 3-15 (Marin LAFCO)			
Category	-2013-Baseline	2023	10-Year Change
Annual Total	127.4	114.2	(10.4%)
Average Day	0.36	0.31	(13.9%)
Peak Day	0.68	0.75	10.3%
Connections	587	587	0.0%
Per Day Connection	194 gallons	193 gallons	(0.5%)
Residents	1,574	1,574	0.0%
Per Day Resident	72 gallons	65 gallons	(9.7%)

- Amounts in Acre Feet Unless Stated Otherwise

Inverness Public Utility District

The Commission projects IPUD’s overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 6.5 acre-feet or 8.1%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 5.8% from 52 gallons to 55 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by more than one-half compared to increases generated over the most recent five-year period.

LAFCO projects IPUD’s annual potable demands will increase over the baseline year by 8.1% in 2023. It is also projected relative demand as measured by per capita usage will increase by 5.8%; the latter amount representing a 65% cutback in the rate increase in per capita usage over the study period.

Projected IPUD Water Demands

Table 3-16 (Marin LAFCO)

Category	-2013-Baseline	2023	10-Year Change
Annual Total	79.8	86.3	8.1%
Average Day	0.22	0.24	9.1%
Peak Day	0.42	0.46	9.5%
Connections	509	515	1.2%
Per Day Connection	125 gallons	150 gallons	20.0%
Residents	1,375	1,392	1.2%
Per Day Resident	52 gallons	55 gallons	5.8%

- Amounts in Acre Feet Unless Stated Otherwise

Muir Beach Community Services District

The Commission projects MBCSD's overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 2.6 acre-feet or 9.7%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 5.1% from 56 gallons to 59 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by more than double compared to increases generated over the most recent five-year period.

LAFCO projects MBCSD's annual potable demands will increase over the baseline year by 9.7% in 2023. It is also projected relative demand as measured by per capita usage will increase by 5.1%; the latter amount representing a 130% cutback in the rate increase in per capita usage over the study period.

Projected MBCSD Water Demands

Table 3-17 (Marin LAFCO)

Category	-2013-Baseline	2023	10-Year Change
Annual Total	26.93	29.54	9.7%
Average Day	0.074	0.081	9.5%
Peak Day	0.122	0.135	10.7%
Connections	159	165	3.6%
Per Day Connection	151 gallons	160 gallons	6.0%
Residents	431	450	4.4%
Per Day Resident	56 gallons	59 gallons	5.1%

- Amounts in Acre Feet Unless Stated Otherwise

Stinson Beach County Water District

The Commission projects SBCWD's overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 57.0 acre-feet or 33.4%. This projection has been calculated using regression analysis involving production demands during the last four years of the study period and shows a similar increase in relative demand with per capita usage increasing by 30.8% from 78 gallons to 102 gallons by 2023. This latter amount indicates the increase in relative demand will further escalate by over one-half more compared to the rate of increase generated over the study period.

LAFCO projects SBCWD's annual potable demands will increase over the baseline year by 33.4% in 2023. It is also projected relative demand as measured by per capita usage will increase by 30.8%; an amount that would add and escalate to the current increase in the per capita rate usage by 56% over the study period.

Projected SBCWD Water Demands

Table 3-18 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	170.7	227.7	33.4%
Average Day	0.47	0.62	31.9%
Peak Day	0.73	1.04	41.8%
Connections	727	737	1.4%
Per Day Connection	210 gallons	276 gallons	31.4%
Residents	1,957	1,985	1.4%
Per Day Resident	78 gallons	102 gallons	30.8%

- Amounts in Acre Feet Unless Otherwise Noted

Marin Municipal Water District

The Commission projects MMWD's overall annual potable demands will decrease over the baseline year and through the next 10-year period by (1,756.1) acre-feet or (6.4%). This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar decrease in relative demand with per capita usage lowering by (7.6%) from 132 gallons to 122 gallons by 2023. This latter amount indicates the rate of relative demand will by over double or 155% compared to savings achieved over the study period.

LAFCO projects MMWD's annual potable demands will decrease over the baseline year by (6.4%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (7.6%); an amount that more than doubles the reduction rate in per capita usage over study period.

LAFCO Projected Demands for MMWD

Table 3-19 (Marin LAFCO)

Category	-2013-Baseline	2023	10-Year Change
Annual Total	27,403.0	25,646.9	(6.4%)
Average Day	75.1	70.3	(6.4%)
Peak Day	106.5	106.2	(0.3%)
Connections	61,391	62,380	1.6%
Per Day Connection	399 gallons	367 gallons	(8.0%)
Residents	186,048	187,128	0.6%
Per Day Resident	132 gallons	122 gallons	(7.6%)

- Amounts in Acre Feet Unless Provided Otherwise

North Marin Water District – Novato

The Commission projects NMWD's Novato system will experience an overall increase in annual potable demands over the baseline year and through the next 10-year period of 440.1 acre-feet or 4.5%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 3.6% from 139 gallons to 144 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by two-thirds compared to increases generated over study period.

LAFCO projects the Novato system's annual potable demands will increase over the baseline year by 4.5% in 2023. It is also projected relative demand as measured by per capita usage will increase by 3.6%; the latter amount representing a 66% cutback in the rate increase in per capita usage over the study period.

LAFCO Projected Demands for NMWD-Novato

Table 3-20 (Marin LAFCO)

Category	-2013-Baseline	2023	10-Year Change
Annual Total	9,976.4	10,236.5	4.5%
Average Day	26.8	28.0	4.5%
Peak Day	45.4	51.5	7.3%
Connections	20,492	20,636	15.3%
Per Day Connection	426 gallons	442 gallons	3.8%
Residents	62,891	63,396	0.4%
Per Day Resident	139 gallons	144 gallons	3.6%

- Amounts in Acre Feet Unless Provided Otherwise

North Marin Water District – PRS

The Commission projects NMWD’s Point Reyes Station system will experience an overall decrease in annual potable demands over the next 10-year of 4.7 acre-feet or (1.85%). This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage decreasing by (6.8%) from 117 gallons to 109 gallons by 2023. This latter amount indicates the decrease in relative demand will decelerate or slow by more than one-half compared to savings generated over the study period.

LAFCO projects the Point Reyes Station system’s annual potable demands will decrease over the baseline year by (1.9%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (6.8%); the latter amount representing a 59% cutback in the current rate of savings in per capita usage.

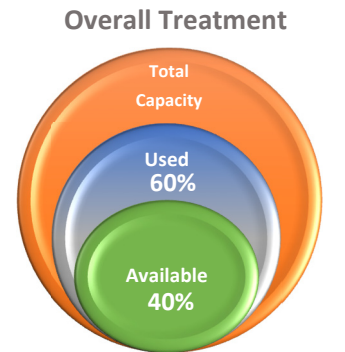
LAFCO Projected Demands for NMWD-Point Reyes St.			
Table 3-21 (Marin LAFCO)			
Category	-2013-Baseline	2023	10-Year Change
Annual Total	253.7	249.0	(1.9%)
Average Day	0.70	0.68	(2.9%)
Peak Day	1.23	1.43	16.20%
Connections	776	779	(0.4%)
Per Day Connection	294g	284g	(3.4%)
Residents	1,954	2,036	2.1%
Per Day Resident	117g	109g	(6.8%)

- Amounts in Acre Feet Unless Provided Otherwise

C. Potable Treatment and Storage Facilities

1.0 Treatment Facilities

The six affected agencies have a combined maximum daily treatment capacity within their seven service areas of 86.7 million gallons or 266.3 acre-feet. This total treatment capacity among the six affected agencies allows these systems to jointly treat up to four-fifths of the daily raw water supplies available to their service areas under normal/maximum conditions. The total treatment capacity also allows the affected agencies to accommodate up to 60% of the current and combined peak-day demand average over the study period; the result being there is 40% available capacity going forward in meeting average peak day demands.



Individual agency treatment capacities within the seven service areas varies with respect to available surplus in meeting average peak-day demands over the study period from a

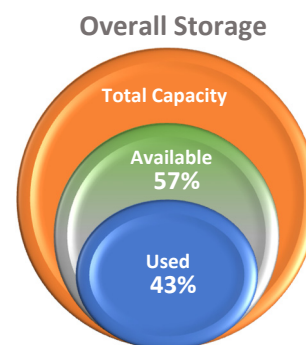
high of 73.6% with MBCSD to a low of (2.9%) with BCPUD. A summary of individual agency treatment capacities with a breakdown of their used and available allowances relative to meeting their study period averages follows.

Individual Agencies' Treatment Capacities							
Table 3-22 (Marin LAFCO)							
Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Point Reyes
Total Capacity	0.70 100%	0.53 100%	0.44 100%	1.19 100%	181.00 100%	80.26 100%	2.14 100%
Used Capacity	0.72 103%	0.37 70%	0.12 26%	0.75 63%	109.60 61%	46.10 57%	1.45 68%
Available Capacity	(0.02) (3%)	0.16 30%	0.32 68%	0.44 56%	71.40 39%	34.16 43%	0.69 32%

- Amounts in Acre Feet Unless Provided Otherwise
- Used and Available Capacities Based on Agencies' Average Five-Year Peak-Day Demands

2.0 Storage Facilities

The six affected agencies have collectively available up to 121.1 million gallons or 373.5 acre-feet in storage within their distribution systems. This total storage capacity allows the affected agencies to jointly hold up to 140.3% of the maximum amount of daily treated supplies available to enter the underlying seven service areas. This total storage capacity is currently at 42.6% of use relative to the current and combined peak-day demand average over the study period and means 57.4% of additional capacity going forward. The total storage capacity also provides the six affected agencies the collective ability to accommodate up to 2.3 days of peak-day demands without system recharge.



Individual agency storage capacities within the seven service areas varies with respect to available surplus in meeting average peak-day demands over the last five-year period from a high of 91.6% with MBCSD to a low of 54.7% with NMWD-Point Reyes Station. A summary of individual agency storage capacities with a breakdown of their used and available allowances relative to meeting their five-year peak-demand averages follows.

Individual Agencies' Storage Capacities							
Table 3-23 (Marin LAFCO)							
Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Point Reyes
Total Capacity	2.68 100%	1.30 100%	1.38 100%	3.64 100%	250.90 100%	110.40 100%	3.20 100%
Used Capacity	0.72 27%	0.37 29%	0.12 8%	0.75 21%	109.60 44%	46.10 42%	1.45 46%
Available Capacity	1.96 73%	0.93 71%	1.26 92%	2.89 79%	141.3 56%	64.3 58%	1.75 54%

- Amounts in Acre Feet Unless Provided Otherwise
- Used and Available Capacities Based on Agencies' Average Five-Year Peak-Day Demands

D. Infrastructure Capacity to Demand Ratios

Under normal and non-peak conditions all six affected agencies currently have available capacity in supply, storage, and treatment relative to accommodating existing demands in their seven service areas based on study period averages. The affected agencies also have generally sufficient capacities to accommodate current peak-day demands under normal conditions with some limited exceptions involving BCPUD (storage) and MBCSD (supplies). These capacities under normal conditions are also expected to accommodate projected demands through the timeframe of this study in 2023 with some exceptions as detailed below. All agencies, however and significantly, are expected to experience system stresses – albeit to different degrees – under projected single-dry year conditions when annual and daily supplies revert to 1977 conditions and in particular in meeting *peak-day demands* through 2023 (see accompanying footnote).³⁸

Under normal conditions the combined potable supplies established by the six affected agencies have more than two-thirds additional capacity to meet current annual demands among the seven service areas with a current demand-to-supply ratio of 31%. Minimal changes to this ratio are expected through 2023.

1.0 Supply Capacities to Demands

Existing potable water supplies are sufficient for all six affected agencies to meet current annual demands within the seven service areas under normal and non-peak conditions now and through the end of this study period (2023). This sufficiency is marked by calculating the current combined annual demand-to-supply ratio covering all seven service areas at 30.5% with an expected rise to 30.7% by 2023; ratios that denote overall surpluses of available potable water supplies during normal conditions of more than two-thirds exists now and through the next 10-year period. Higher ratios are calculated for peak-day demands under normal supply conditions with the overall baseline totaling 48.7% and rising to 49.4% in 2023 with only two agencies – BCPUD and MMWD – showing deficits as detailed in the succeeding section.

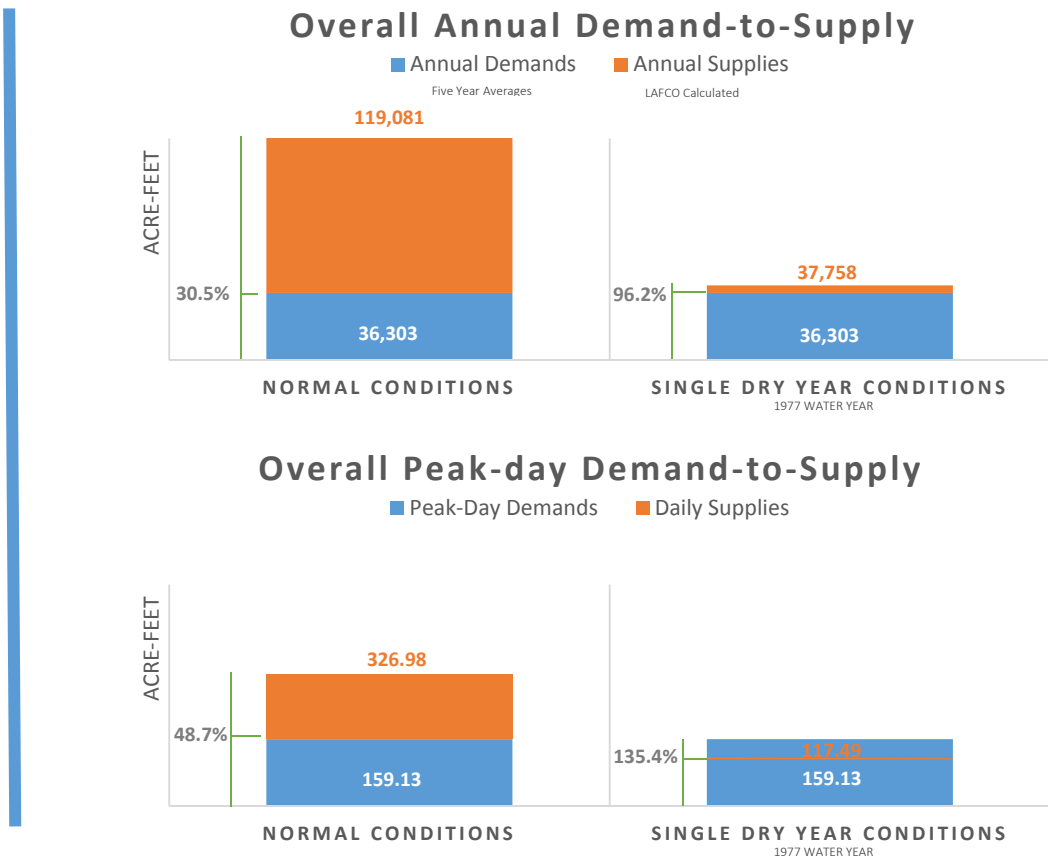
All six agencies generally have adequate capacities in meeting current and projected demands within the 10-year timeframe of this review under normal conditions. All six agencies, however, are projected to experience moderate to significant system stress under projected single-dry year conditions paralleling 1977.

³⁸ Consideration of peak-day demands are particularly germane to this study given Title 22 of the Code of Regulations requires all public community water systems maintain sufficient source, treatment, and storage capacities to meet their peak day demands.

The availability of potable supplies under projected single-dry year conditions to match 1977 conditions – a standard threshold used for drought planning – creates a different narrative in which overall supplies decrease by more than two-thirds from 119,081 acre-feet to 37,758 acre-feet. This projected decrease, markedly, creates capacity challenges for most of the affected agencies and generates a current and overall combined annual demand-to-supply ratio of 96.2% and rises to 96.9% by 2023.³⁹

Under projected single dry-year conditions set to parallel 1977 the combined potable supplies established by the six affected agencies are collectively near capacity with a current annual demand-to-supply ratio of 96%; a ratio that rises to 135% or (35%) during peak-day demand periods.

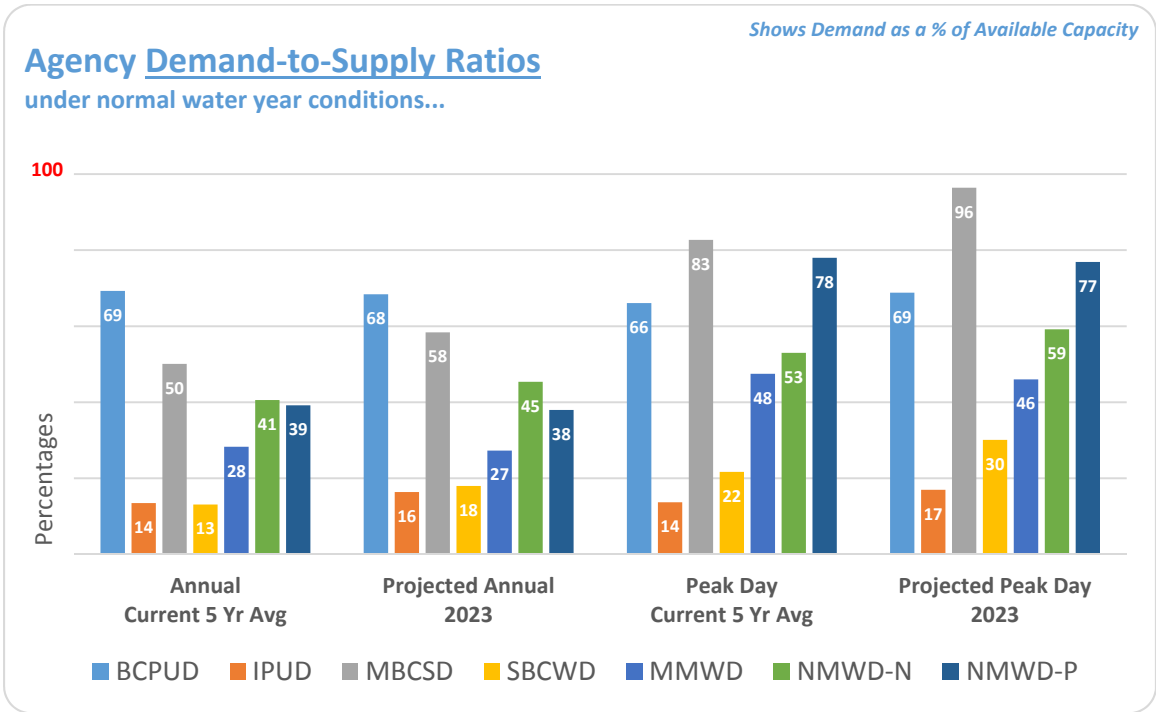
These projected system stresses under single dry-year conditions are further marked during high-use periods with peak-day demand-to-supply ratios equaling 135.4% and rising to 137.5% in 2023; amounts that show more than a one-third capacity deficit.



³⁹ It is reasonable to assume system demands will remain constant during a single-dry year drought given consumers have not adjusted their usage trends relative to the prior year.

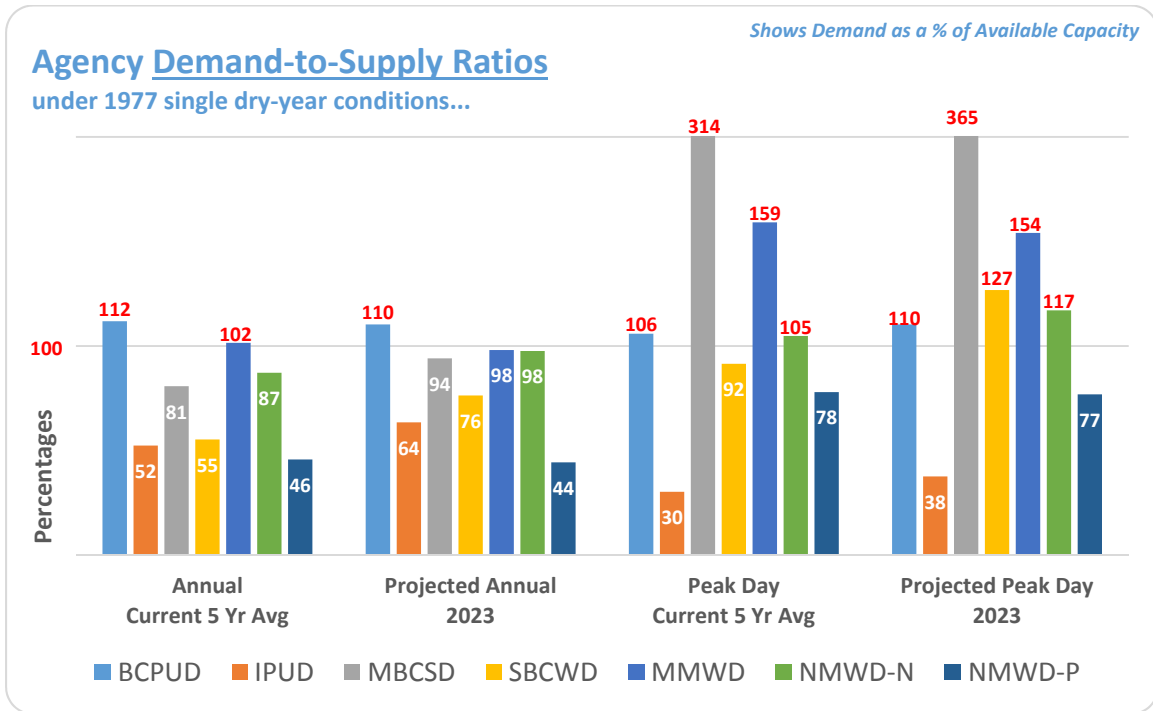
Under normal conditions demand-to-supply ratios for all six affected agencies show sufficient capacities to accommodate current and projected annual and peak-day usage within their seven service areas now and going forward to 2023. Individual annual demand-to-supply ratios range from a low of 15.1% for IPUD to a high of 76.3% for BCPUD with minimal changes for any expected over the next 10 year period. Individual peak-day demand-to-supply ratios are generally much higher but remain well within capacity for most of the agencies with the lone exception of BCPUD which currently tallies 82.7% and expected to rise to 96.4% by 2023.

All six agencies have positive demand-to-supply ratios under normal conditions with the lone qualifier BCPUD is approaching capacity with respect to accommodating peak-day uses.



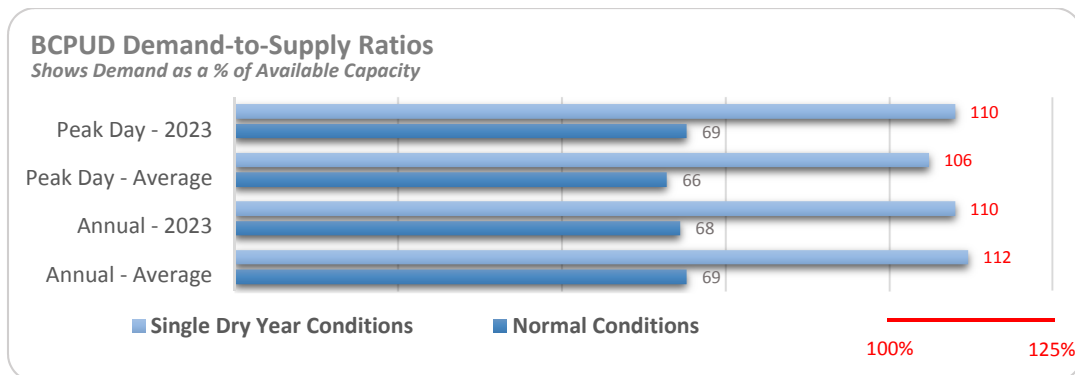
Under single dry-year conditions demand-to-supply ratios show moderate to significant system stresses for five of the seven service areas either now and/or going forward to 2023 with respect to annual and peak-day capacity measurements. These agencies with one or more measured supply deficits are BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato. Agencies with the most negative demand-to-supply ratios of the four categories measured by the Commission are BCPUD and MMWD; both of which are also the only two agencies with current negative annual deficits. Also of note MBCSD’s current ratio in meeting peak-day demands is in a current deficit of more than (200%) and is projected to rise to nearly (300%) by 2023

Five of the seven service areas – BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato – have one or more negative demand-to-supply ratios under single dry-year conditions to match 1977.



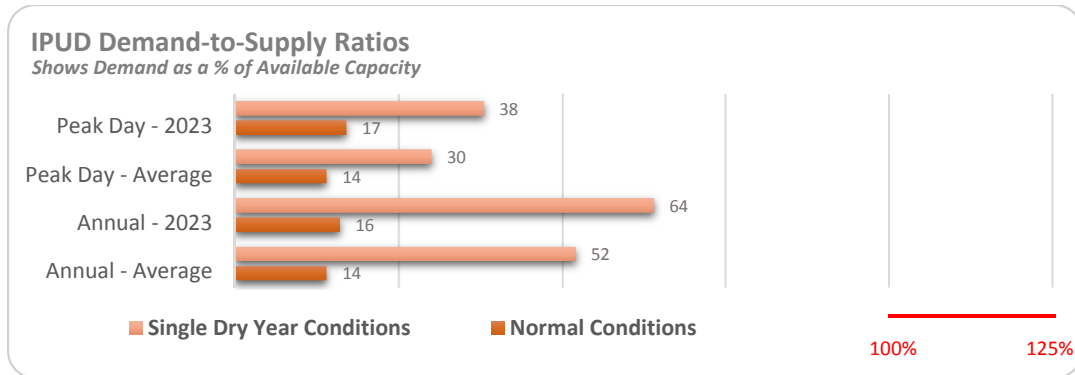
Bolinas Community Public Utility District

BCPUD’s water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions now and going forward through 2023 timeframe – albeit at low levels compared to other agencies with the corresponding ratios all approaching 70% capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with BCPUD’s annual and peak-day ratios all exceeding 100%.



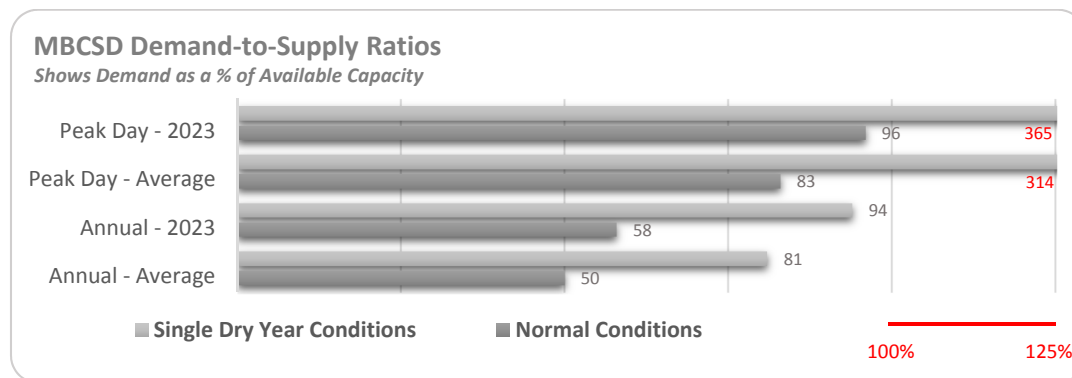
Inverness Public Utility District

IPUD’s water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding ratios all falling under 18% capacity. Demand-to-supply ratios under projected single dry-year conditions (1977) also fall within capacity and do not exceed 64%.



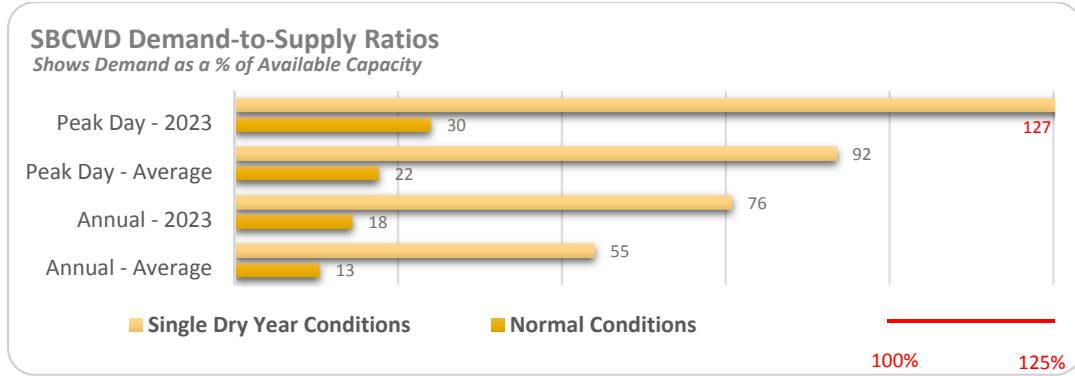
Muir Beach Community Services District

MBCSD’s water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through 2023 timeframe with the corresponding measurements falling under 60% of capacity. Demand-to-supply ratios, however, significantly increase during projected single dry-year conditions (1977) now and going forward with annual totals approaching capacity and peak-day totals exceeding 300% capacity.



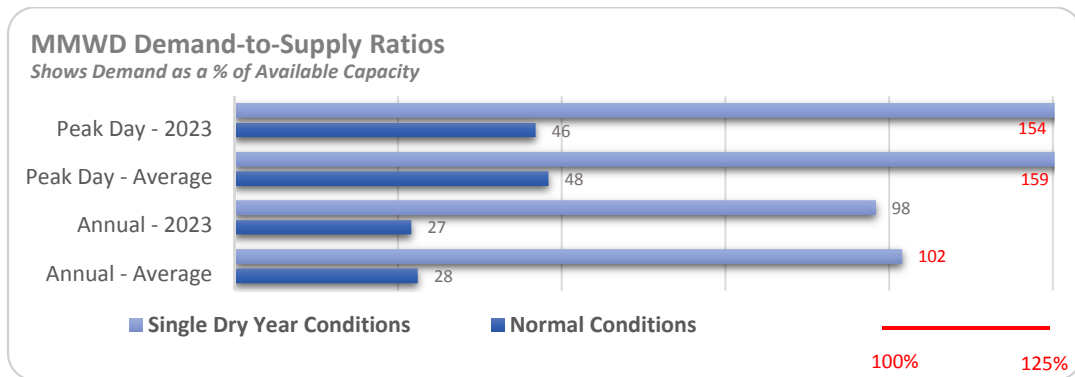
Stinson Beach County Water District

SBCWD’s water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding ratios all falling under 30% capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual totals approaching 80% capacity and peak-day totals exceeding 120% capacity by 2023.



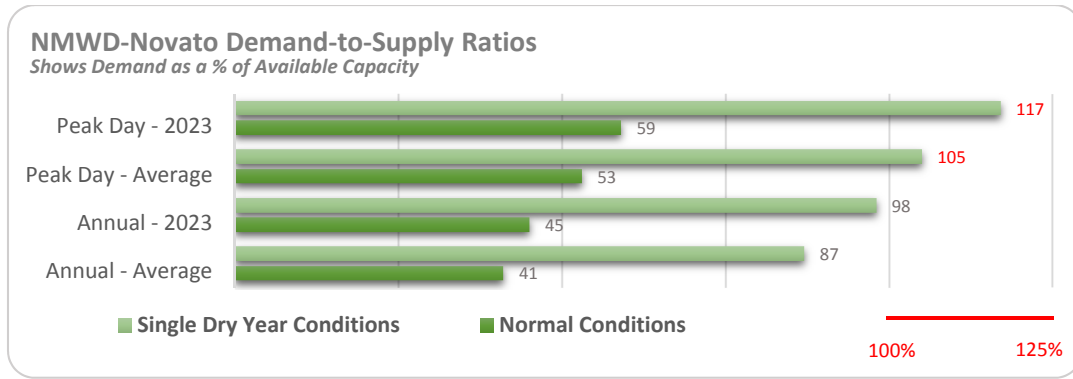
Marin Municipal Water District

MMWD’s water system is currently operating with available potable relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements falling under 30% of capacity. Peak-day demands under normal conditions also fall within capacity and fall below 50%. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual demands at capacity and peak-day demands exceeding capacity up to 160%.



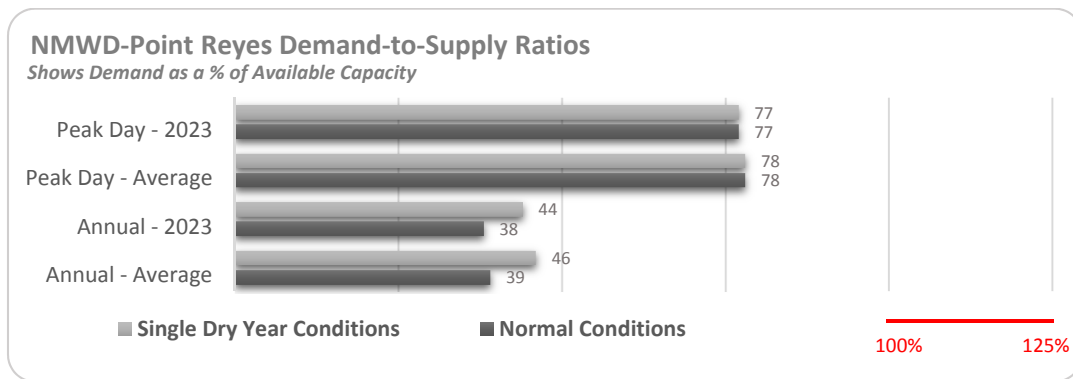
North Marin Water District – Novato

NMWD-Novato’s water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements all falling under 60% of capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual demands at capacity and peak-day demands exceeding capacity up to 120%.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station’s water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements falling under 40% of capacity. Peak-day demands under normal conditions also fall within capacity and below 80%. Demand-to-supply ratios rise during projected single dry-year conditions (1977) now and going forward with annual demands increasing to 50% and peak-day demands to 80%.



2.0 Treatment Capacities to Demands

The six affected agencies’ treatment facilities and/or contracts therein have the collective capacity to deliver up to 86.7 million gallons or 266.3 acre-feet of potable water each day within their seven service areas.⁴⁰ This total delivery amount equals 81.3% of the projected and maximum amount of accessible daily raw water supplies available by right, permit, or contract to the six agencies under normal conditions. This

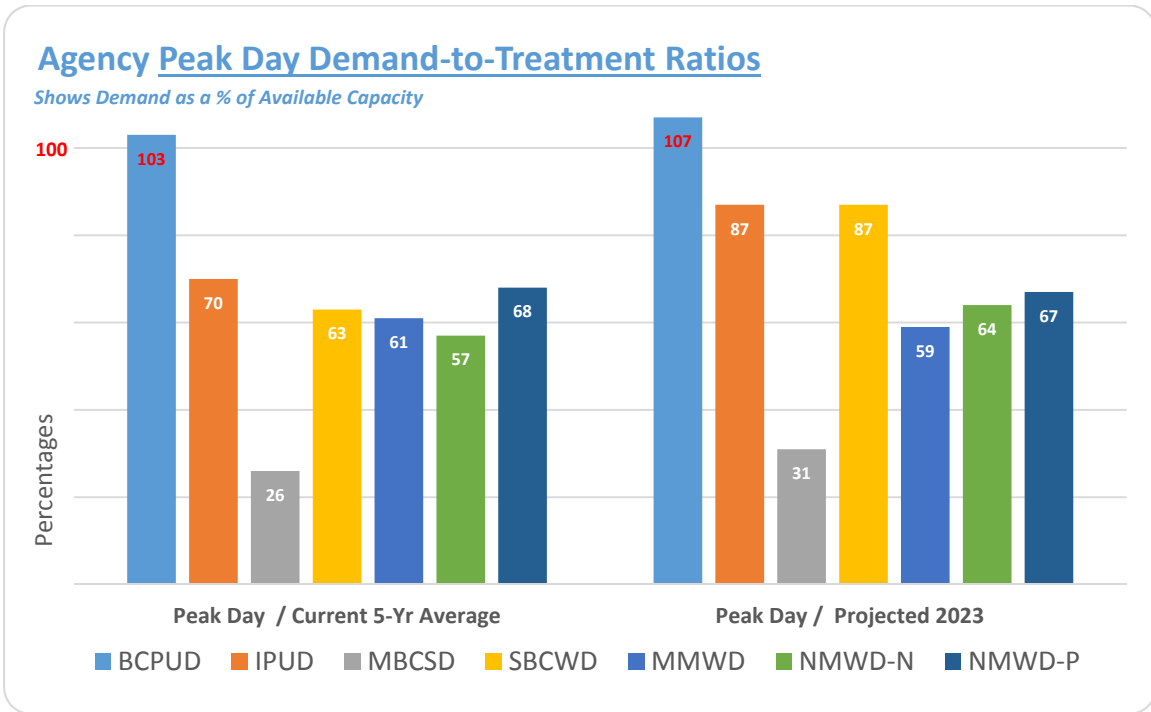
The six affected agencies have the collective capacity to treat and deliver up to 266 acre-feet of potable supplies to their seven service areas; an amount that surpasses the combined agency average peak-day demand of 159 acre-feet and results in 40% of available capacity.

⁴⁰ This total amount incorporates NMWD-Novato’s contract for treated potable supplies from SCWA. MMWD also contract SCWA, but treats its potable deliveries to add fluoride at its Ignacio Treatment Facility.

total delivery amount, separately, accommodates the current five-year average peak-day demand within the seven service areas – 159.1 acre-feet – with an additional 40% of overall remaining capacity. This latter ratio is expected to remain relatively unchanged going forward to 2023.

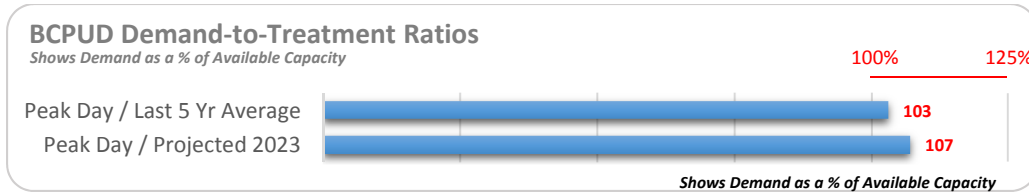
Nearly all of the six affected agencies have existing treatment capacities and/or contracts therein to accommodate their current five-year average peak-day demands within their service areas. The lone exception involves BCPUD whose average peak-day demand over the last five-year period equals 103% of the agency’s maximum daily treatment capacity and is on pace to reach 107% by 2023. The remaining agencies’ existing average peak-day demand-to-treatment capacity ratios range from 26% (MBCSD) to 70% (IPUD). Two additional agencies – IPUD and SBCWD – are projected to near their respective daily treatment capacity by 2023.

Only BCPUD’s current five-year average peak-day demand exceeds the agency’s treatment capacity. It is projected two others – IPUD and SBCWD – will near their treatment capacity by 2023.



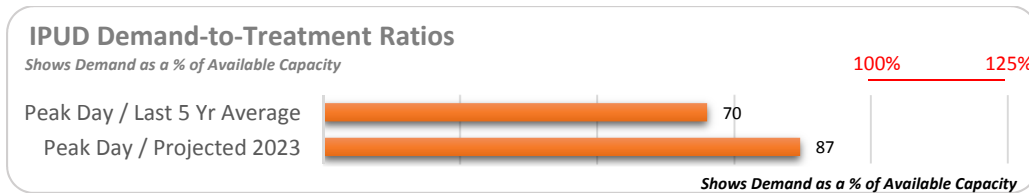
Bolinas Community Public Utility District

BCPUD’s treatment facilities currently provide a maximum daily capacity of 0.70 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within BCPUD over the study period equals 102.9% and is projected to increase to 107.1% by 2023. These existing and projected ratios produces treatment capacity deficits for BCPUD ranging in intensity from (2.9%) to (7.1%) over the next 10-year period.



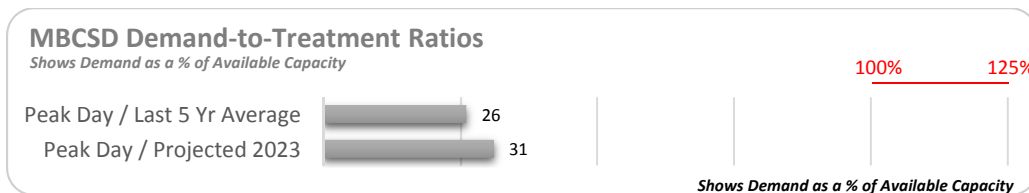
Inverness Public Utility District

IPUD’s treatment facilities currently provide a maximum daily capacity of 0.53 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within IPUD over the study period equals 69.8% and is projected to increase to 86.8% by 2023. These existing and projected ratios produces treatment capacity surpluses for IPUD ranging in intensity from 13.2% to 30.2% over the next 10-year period.



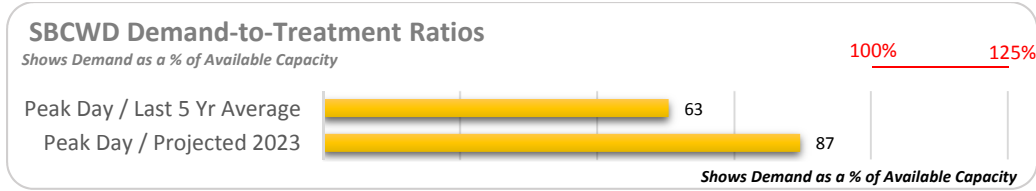
Muir Beach Community Services District

MBCSD’s treatment facilities currently provide a maximum daily capacity of 0.44 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within MBCSD over the study period equals 26.4% and is projected to increase to 30.7% by 2023. These existing and projected ratios produces treatment capacity surpluses for MBCSD ranging in intensity from 69.3% to 73.6% over the next 10-year period.



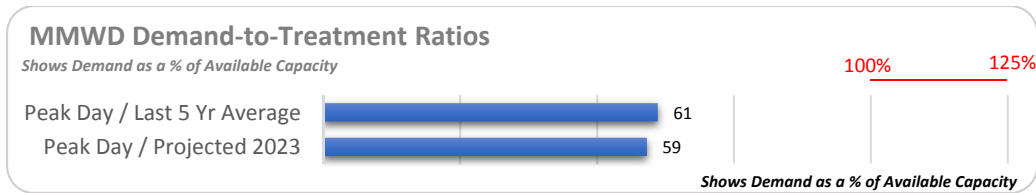
Stinson Beach County Water District

SBCWD’s treatment facilities currently provide a maximum daily capacity of 1.19 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within SBCWD over the study period equals 63.0% and is projected to increase to 87.4% by 2023. These existing and projected ratios produces treatment capacity surpluses for SBCWD ranging in intensity from 12.6% to 37.0% over the next 10-year period.



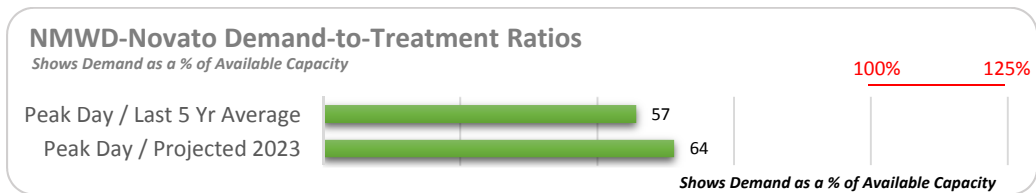
Marin Municipal Water District

MMWD’s treatment facilities currently provide a maximum daily capacity of 181.0 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within MMWD over the study period equals 60.6% and is projected to decrease to 58.7% by 2023. These existing and projected ratios produces treatment capacity surpluses for MMWD ranging in intensity from 39.4% to 41.3% over the next 10-year period.



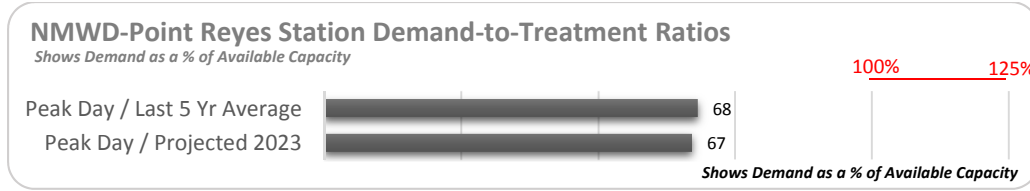
North Marin Water District – Novato

NMWD-Novato’s treatment facilities and related contracted supplies therein currently provide a maximum daily capacity of 80.3 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within the Novato system over the study period equals 57.4% and is projected to increase to 64.2% by 2023. These existing and projected ratios produces treatment capacity surpluses for the Novato system ranging in intensity from 35.8% to 42.8% over the next 10 year period.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station’s treatment facilities currently provide a maximum daily capacity of 2.1 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within the Point Reyes Station system over the study period equals 67.8% and is projected to slightly decrease to 66.8% by 2023. These existing and projected ratios produces treatment capacity surpluses for the Point Reyes Station system ranging in intensity from 32.2% to 33.2% over the next 10 year period.



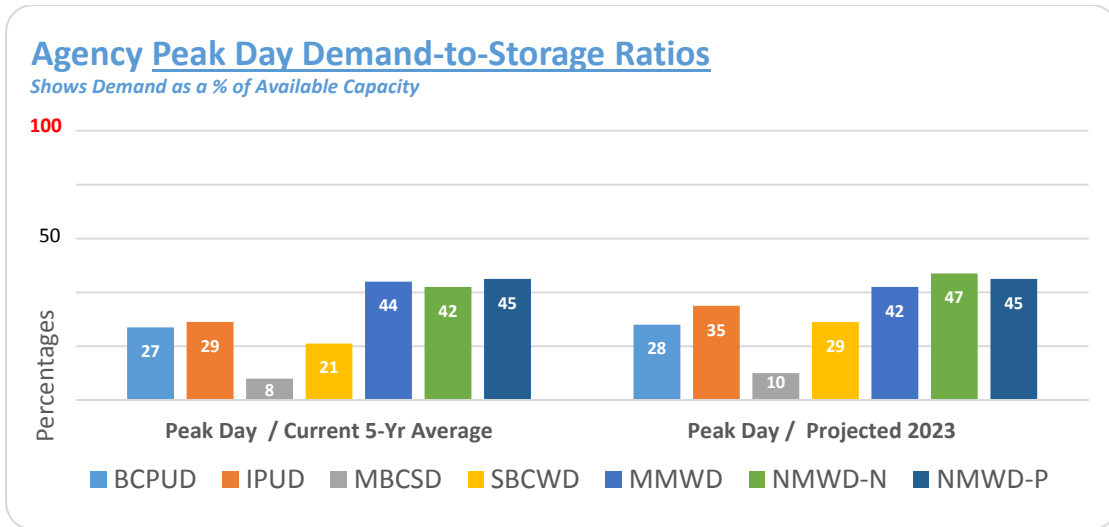
3.0 Storage Capacities to Demands

The six affected agencies’ potable storage facilities have the collective capacity to hold up to 121.7 million gallons or 373.5 acre-feet within their seven service areas. This total storage amount accommodates the current study period average peak-day demand within the seven service areas – 159.1 acre-feet – with an additional 61% of overall remaining capacity for future use. This total amount also translates to a collective storage capacity to accommodate up to 2.3 days of consecutive peak-demand usage without system replenishment and the result of a wide range among the seven service areas. This latter measurement is expected to remain relatively unchanged through the 2023 timeframe.

The six affected agencies have the collective capacity to store up to 373 acre-feet of potable supplies within their seven service areas; an amount that surpasses the combined agency average peak-day demand of 159 acre-feet and provides 2.3 days of continuous supply without system replenishment.

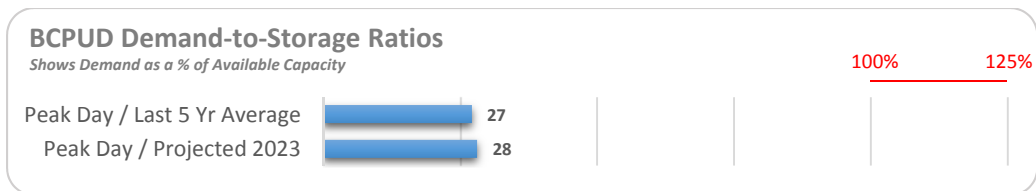
All six affected agencies have existing storage capacities to accommodate their current study period average peak-day demands within their respective service areas. None of the agencies exceed 50% capacity with the current peak day demand-to-storage ratios range between 8% (MBCSD) to 45% (NMWD-Point Reyes Station) with no significant changes projected over the next 10-year period. However, three of the seven service areas have less than three days of potable storage capacity to meet continuous peak-day demands – such as a summer-time fire incident – without recharge. The agencies with less than three days of continuous peak-demand storage are NMWD-Point Reyes Station at 2.2, MMWD at 2.3, and NMWD-Novato at 2.4.

All seven service areas have sufficient storage to meet their average peak-day demand totals over the study period. Only three service areas – NMWD-PRS, MMWD, and NMWD-Novato – have less than three days of continuous storage to meet peak-day demands without recharge.



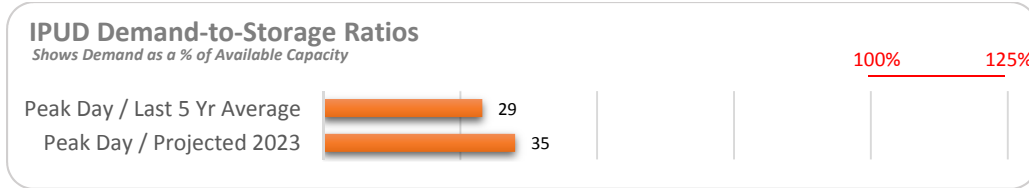
Bolinas Community Public Utility District

BCPUD’s storage facilities currently provide a maximum holding capacity of 2.68 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within BCPUD over the study period equals 26.9% and is projected to increase to 28.0% by 2023. These existing and projected ratios produces storage capacity surpluses for BCPUD ranging in intensity from 72.0% to 73.1% over the next 10-year period. These latter ratios presented differently produce an average of 3.7 to 3.6 days of storage capacity to continuously meet peak-day demands without system recharge.



Inverness Public Utility District

IPUD’s storage facilities currently provide a maximum holding capacity of 1.30 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within IPUD over the study period equals 28.5% and is projected to increase to 35.4% by 2023. These existing and projected ratios produces storage capacity surpluses for IPUD ranging in intensity from 64.6% to 71.5% over the next 10-year period. These latter ratios presented differently produce an average of 3.5 to 2.8 days of storage capacity to continuously meet peak-day demands without system recharge.



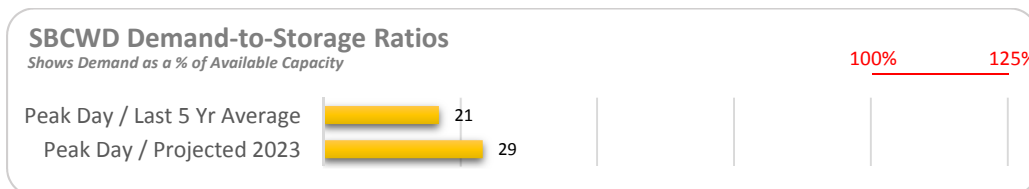
Muir Beach Community Services District

MBCSD’s storage facilities currently provide a maximum holding capacity of 1.38 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within MBCSD over the study period equals 8.4% and is projected to increase to 9.8% by 2023. These existing and projected ratios produces storage capacity surpluses for MBCSD ranging in intensity from 90.2% to 91.6% over the next 10-year period. These latter ratios presented differently produce an average of 11.9 to 10.2 days of storage capacity to continuously meet peak-day demands without system recharge.



Stinson Beach County Water District

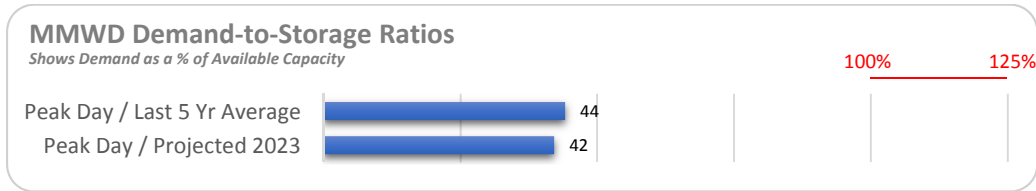
SBCWD’s storage facilities currently provide a maximum holding capacity of 3.64 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within SBCWD over the study period equals 20.6% and is projected to increase to 28.6% by 2023. These existing and projected ratios produces storage capacity surpluses for SBCWD ranging in intensity from 71.4% to 79.4% over the next 10-year period. These latter ratios presented differently produce an average of 4.9 to 3.5 days of storage capacity to continuously meet peak-day demands without system recharge.



Marin Municipal Water District

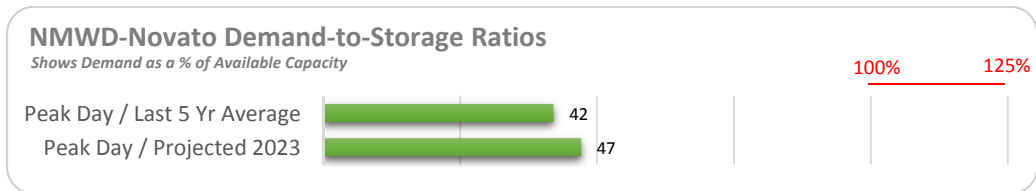
MMWD’s storage facilities currently provide a maximum holding capacity of 250.9 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within MMWD over the study period equals 43.7% and is projected to decrease to 42.3% by 2023. These existing and projected ratios produces storage capacity surpluses for MMWD ranging in intensity from 56.3% to 57.7% over the next 10-year period. These latter ratios presented differently produce

an average of 2.3 to 2.4 days of storage capacity to continuously meet peak-day demands without system recharge.



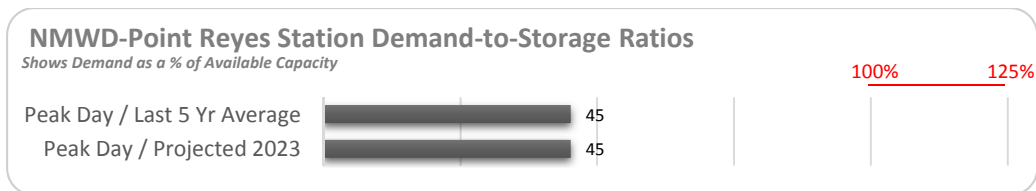
North Marin Water District – Novato

NMWD-Novato’s storage facilities currently provide a maximum holding capacity of 110.4 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within the Novato system over the study period equals 41.8% and is projected to increase to 46.6% by 2023. These existing and projected ratios produces storage capacity surpluses for the Novato system ranging in intensity from 53.4% to 58.2% over the next 10-year period. These latter ratios presented differently produce an average of 2.4 to 2.1 days of storage capacity to continuously meet peak-day demands without system recharge.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station’s storage facilities currently provide a maximum holding capacity of 3.2 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within Point Reyes Station over the study period equals 45.3% and is projected to slightly decrease to 44.7% by 2023. These existing and projected ratios produces storage capacity surpluses for the Point Reyes Station ranging in intensity from 54.7% to 55.3% over the next 10-year period. These latter ratios presented differently produce an average of 2.2 days of storage capacity to continuously meet peak-day demands without system recharge.



4.3 FINANCIAL

A. Direct Costs to Customers

All six affected agencies providing potable water services in Marin County largely rely on two separate charges to fund day-to-day operations as well as basic system improvements within their seven service areas with some variance in terms of structure or purpose. All seven service areas' primary funding charge are user – or quantity – fees and generally finance day-to-day operations and are applied to actively served parcels. User charges for all seven service areas are currently in tier-format and apply an escalating rate based on metered consumption and billed monthly, bimonthly, or quarterly. The second prominent fee is an availability – or basic – charge that applies to all jurisdictional parcels irrespective of active service and typically funds baseline improvements and generally accounts for a quarter of all operating revenues.

The current average weighted residential cost for potable water service within all seven service areas as of January 2015 is \$0.78 for every 100 gallons.⁴¹ This average produces a similarly weighted annual residential household cost of \$1,175.⁴²

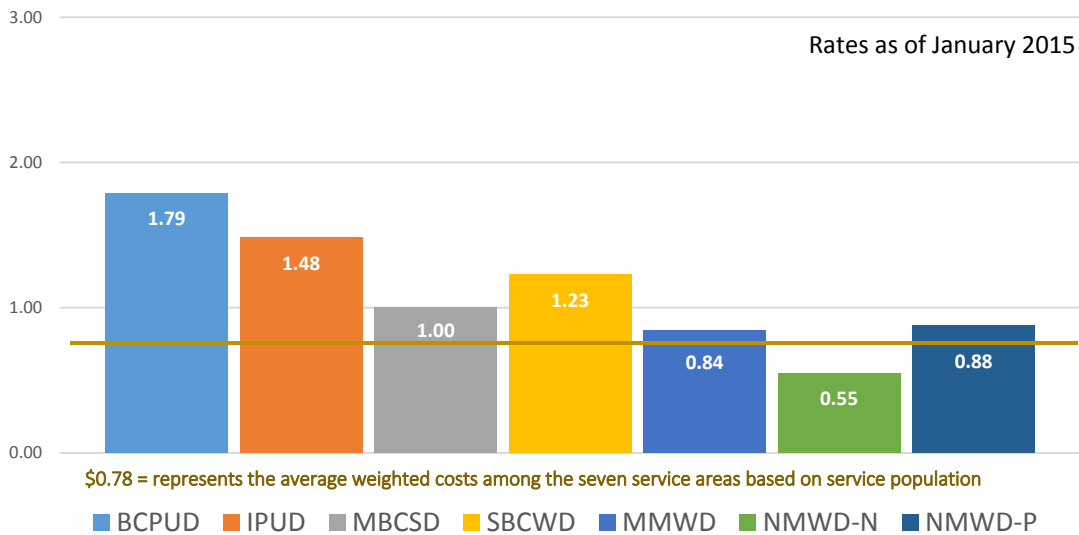
Individual service area charges for potable water service ranges from a low of \$0.55 for NMWD-Novato to a high of \$1.79 for BCPUD for every 100 metered gallons; a range difference of over 225%. As expected potable charges in East Marin are significantly lower than charges in West Marin and presumably aided by the regions differences in economies of scale and ability to spread costs out among users.

The current average weighted residential cost for potable water service based on rates as of January 2015 within all seven service areas is \$0.78 for every 100 gallons, and translates to a weighted annual cost of \$1,175 based on consumption rates over the study period.

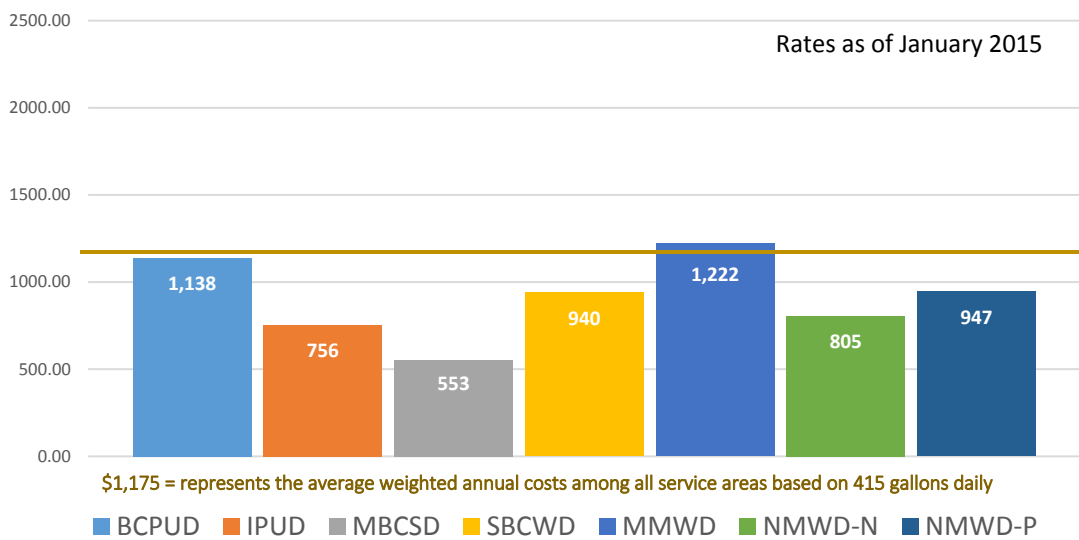
⁴¹ The weighted calculation producing the \$0.78 per 100 gallons is based on summing and dividing all seven service area charges (user and availability) and multiplied by their respective share of overall population percentages.

⁴² The weighted calculation producing an annual residential household cost of \$1,175 is based on a per residential user daily gallon use of 415 gallons.

Average Residential Household Costs for Potable Water / Every 100 Gallons Among Agencies



Average Residential Household Costs for Potable Water / Annual Totals Among Agencies



Bolinas Community Public Utility District

BCPUD relies on two separate charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) availability charges. The user charge was last updated in 2009 with current average meter uses producing a quarterly bill of \$30. The

The current average residential cost for potable water service based on recent usage within BCPUD is \$1,138 and produces \$1.79 per 100 gallons, which represent the highest total among public service providers in Marin County

availability fee was last updated in 2011 and is an annual flat rate service charge of \$1,018 and collected on the property tax bill. The cumulative cost for most BCPUD residential customers is \$1,138 annually and results in a per 100 gallon equivalent charge of \$1.79.

Inverness Public Utility District

IPUD relies on two separate charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) basic charges. The user charge was last updated in 2009 with current average meter uses producing a bimonthly charge of \$25.94. The basic charge serves as an availability and applied bimonthly at a flat \$100.00 amount. The cumulative cost for most IPUD residential customers is \$755.64 annually and results in a per 100 gallon equivalent charge of \$1.48.

The current average residential cost for potable water service based on recent usage within IPUD is \$756 and produces \$1.48 per 100 gallons.

Muir Beach Community Services District

MBCSD relies on two distinct charges and fees to fund the District's water system in terms of operating and improvements: (a) bi-monthly user charge and (b) semi-annual fee for water capital improvements. The user charge was last updated by the Board in 2013 with current average meter uses producing a bimonthly charge of \$92.24. The semi-annual capital improvement fee collects \$300 and \$3,250 each year on the assessment roll for all residential and non-residential connections, respectively, and used only for capital improvements to the water system. The cumulative cost for most MBCSD residential customers is \$533 annually and results in a per 100 gallon equivalent charge of \$1.00.

The current average residential cost for potable water service based on recent usage within MBCSD is \$533 and produces \$1.00 per 100 gallons.

Stinson Beach County Water District

SBCWD relies on two separate monthly charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) availability charges. The user charge was last updated in 2010 with current average meter uses producing a monthly charge of \$39.78. The availability fee is based on meter size with most residential customers receiving a flat monthly charge of \$38.55. The cumulative cost for most residential customers for water service is \$940 annually and results in a per 100 gallon equivalent charge of \$1.23.

The current average residential cost for potable water service based on recent usage within SBCWD is \$940 and produces \$1.23 per 100 gallons.

Marin Municipal Water District

MMWD primarily relies on two distinct billed bi-monthly charges to fund the District's potable water system in terms of covering both administrative and operations: (a) service and (b) usage. The service charge is fixed based on meter size and presently assigns a bi-monthly charge of \$21.53 for most single-family residential users. The usage charge is tiered and adjusts seasonally based on usage occurring either between December and May (lower demand) or June and November (higher demand). The usage charge currently results in the average residential customer paying \$164.56 bi-monthly between December and November and \$199.71 bi-monthly between June and November. The cumulative annual cost for most MMWD residential customers is \$1,222 and results in a per 100 gallon equivalent charge of \$0.84.

The current average residential cost for potable water service based on recent usage within MMWD is \$1,222 and produces \$0.84 per 100 gallons.

North Marin Water District – Novato

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Novato system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge was last updated in 2013 and presently assigns a bi-monthly charge of \$30 for most users. The quantity charge was last updated in 2014 and currently results in the average residential customer paying \$134.13 for every two-month billing cycle. The cumulative cost for most NMWD customers in the Novato system is \$805 annually and results in a per 100 gallon equivalent charge of \$0.55.

The current average residential cost for potable water service based on recent usage within NMWD's Novato system is \$805 and produces \$0.55 per 100 gallons; both of which represent the lowest totals among public service providers in Marin County.

North Marin Water District – Point Reyes

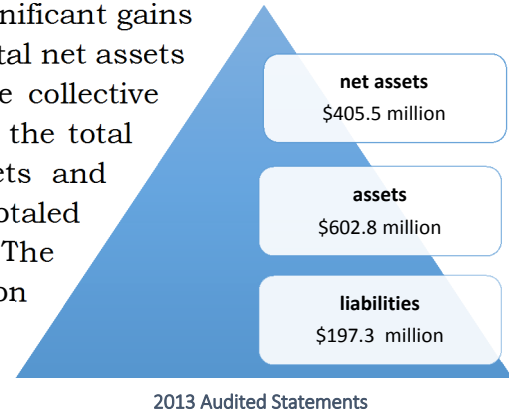
NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Point Reyes Station system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge was last updated in 2013 and presently assigns a bi-monthly charge of \$30 for most users. The quantity charge was last updated in 2014 with current meter uses producing a bimonthly charge of \$157.88. The cumulative costs for most Point Reyes Station customers is \$947 annually and results in a per 100 gallon equivalent charge of \$0.88.

The current average residential cost for potable water service based on recent usage within NMWD's Point Reyes system is \$947 and produces \$0.88 per 100 gallons.

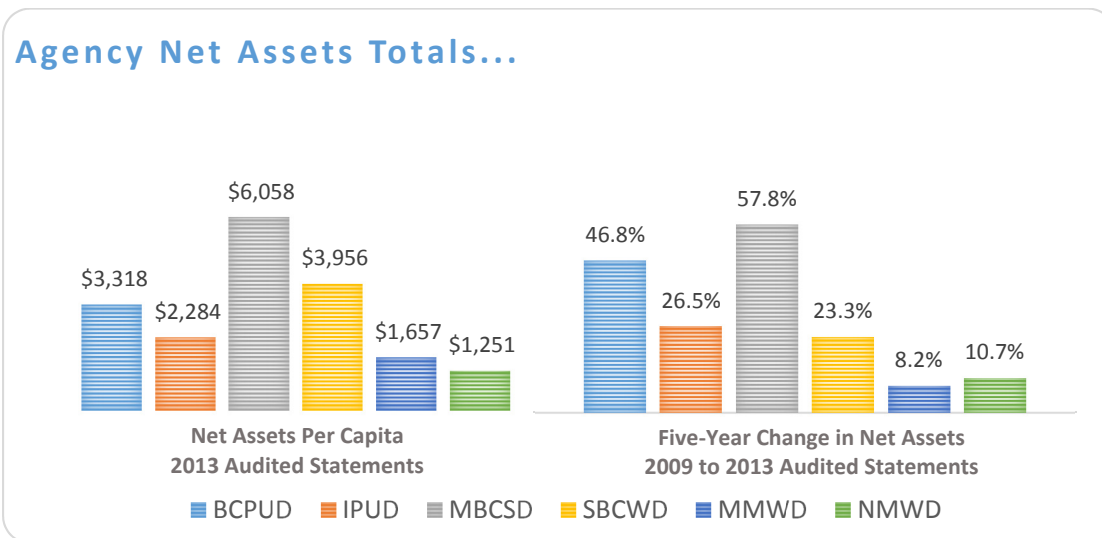
B. Agency Standing

1.0 Net Assets / Unrestricted Fund Balances

All six affected agencies experienced moderate to significant gains in their overall financial standing as measured by total net assets or equity during the course of study period. The collective increase in the six agencies combined net assets – the total difference between current and non-current assets and liabilities – over the corresponding five-year period totaled \$35.4 million and represents a difference of 9.6%.⁴³ The most recent combined year-end total - \$405.5 million – represents a per capita net asset amount of \$1,591 with over one-tenth – or 13.8% – categorized as unrestricted and can be used for any purposes.



Individual changes in net assets among the six affected agencies over the study period ranged from a low of 8.2% from MMWD to a high of 57.5% from MBCSD with the latter agency also having the highest per capita ratio of net assets at \$6,058.



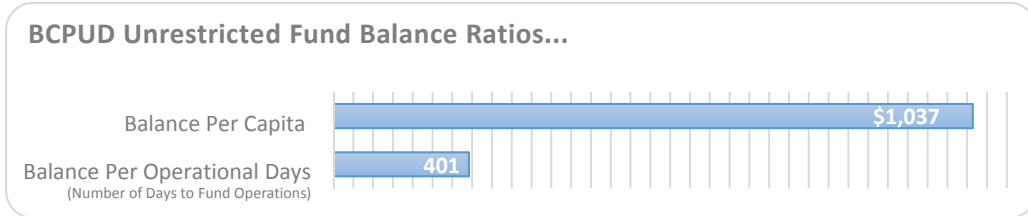
Bolinas Community Public Utility District

BCPUD’s audited net assets at the end of the study period totaled \$5.223 million. This amount has increased by nearly one-half or 46.8% over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with reduction in liabilities and resulting increase in

BCPUD’s unrestricted fund balance total of \$1.633 million at the end of the study periodequates to a per capita amount of \$1,037.

⁴³ MBCSD issues unaudited financial statements prepared by a contract accountant.

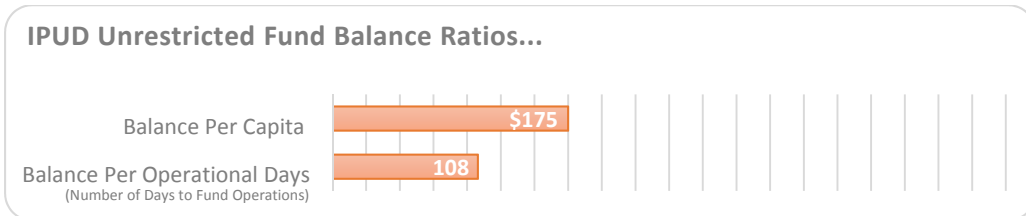
capital assets. The end of year amount includes \$1.633 million in unrestricted funds that has increased by 72.5% over the preceding five-year period and equates to a per capita amount of \$1,037. The unrestricted balance also equates to providing BCPUD funding to cover up to 401 days based on adopted operating expenses.



Inverness Public Utility District

IPUD’s audited net assets at the end of the study period totaled \$3.141 million. This amount has increased by slightly over one-fourth or 26.6% over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with the reduction in liabilities. The end of year net asset amount includes \$0.241 million in unrestricted funds that has decreased by (84.1%) over the preceding five-year period and equates to a per capita amount of \$175. The unrestricted balance also equates to providing IPUD funding to cover up to 108 days based on adopted operating expenses.

IPUD’s unrestricted fund balance total of \$0.241 million at the end of the study period equates to a per capita amount of \$175.

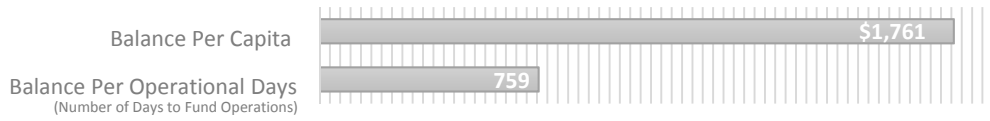


Muir Beach Community Services District

MBCSD’s unaudited net assets at the end of the study period totaled \$2.611. This amount has increased by over one-half or 57.5% over the five previous fiscal years and primarily attributed to collection of funds – including nearly \$0.350 in private donations – for water capital improvements. The end of year amount also includes \$0.759 million in unrestricted funds that has decreased by (20.0%) over the preceding five-year period and results in a per capita ratio of \$1,761. The unrestricted balance also equates to providing MBCSD funding to cover up to 759 days based on adopted operating expenses.

MBCSD’s unrestricted fund balance total of \$0.759 million at the end of the study period equates to a per capita amount of \$1,761.

MBCSD Unrestricted Fund Balance Ratios...

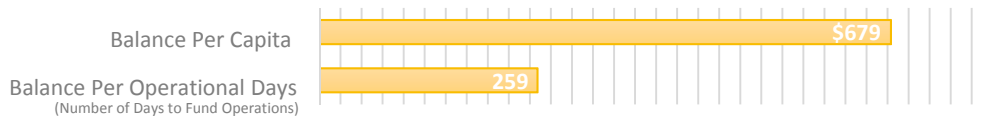


Stinson Beach County Water District

SBCWD’s audited net assets at the end of the study period totaled \$5.070 million. This amount has increased by nearly one-fourth - or 23.3% - over the five previous fiscal years. The end of year amount also includes \$1.330 million in unrestricted funds that has decreased by (20.3%) over the preceding five-year period and results in a per capita ratio of \$679. The unrestricted balance also equates to providing SBCWD funding to cover up to 259 days based on adopted operating expenses.

SBCWD’s unrestricted fund balance total of \$1.3 million at the end of the study period equates to a per capita amount of \$679.

SBCWD Unrestricted Fund Balance Ratios...



Marin Municipal Water District

MMWD’s audited assets at the end of the study period totaled \$308.346 million. The total amount has increased almost one-tenth - or 8.2% - over the preceding five year period. The end of year amount also incorporates a \$38.923 million balance in unrestricted funds that has increased by 13.9% over the preceding five-year period and results in a per capita ratio of \$209. The unrestricted balance also equates to providing MMWD funding to cover up to 231 days based on adopted operating expenses.

MMWD’s unrestricted fund balance total of \$38.9 million at the end of the study period equates to a per capita reserve amount of \$209

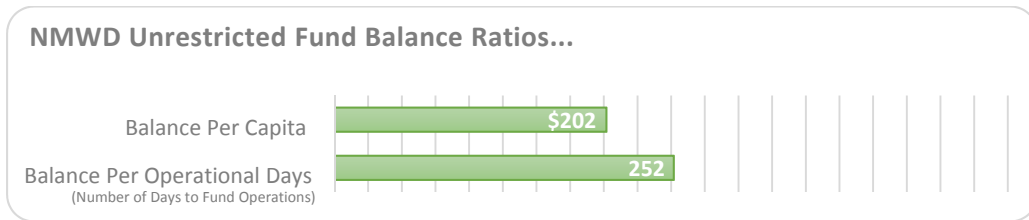
MMWD Unrestricted Fund Balance Ratios...



North Marin Water District

NMWD’s audited net assets at the end of the study period totaled \$81.097 million. This amount has increased by just over ten percent - or 10.7% - over the five previous fiscal years. The end of year equity amount also incorporates a \$13.071 million in unrestricted funds that has increased by 65.0% over the preceding five-year period and results in a per capita ratio of \$202. The unrestricted balance also equates to providing NMWD funding to cover up to 252 days based on adopted operating expenses for both systems.

NMWD’s unrestricted fund balance total of \$13.0 million at the end of the study period equates to a per capita amount of \$202.



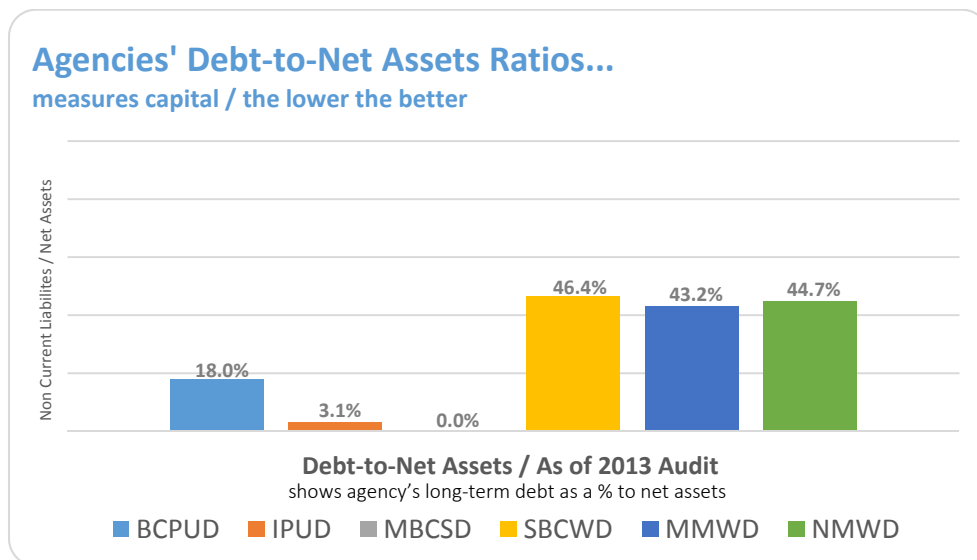
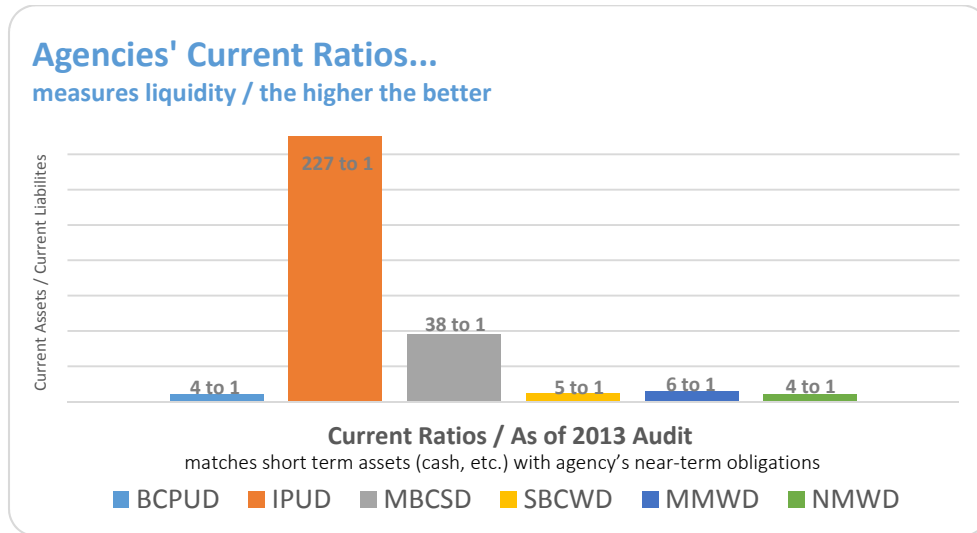
2.0 Liquidity, Capital, and Profitability

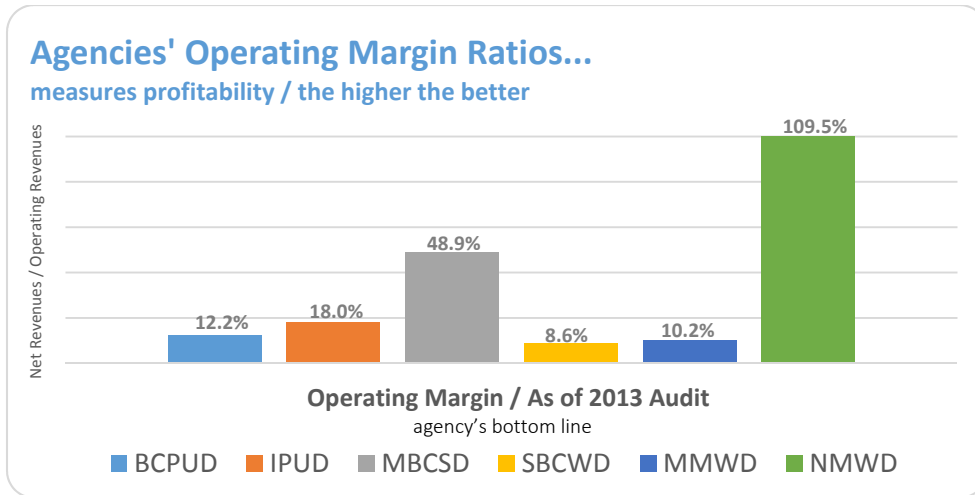
A review of the financial statements issued by all six affected agencies through the study period generally shows relatively strong ending positions with respect to liquidity (ability to address short-term obligations) and profitability (maintain positive cash flows). This includes noting all six agencies ended the review period with no less than a 4 to 1 ratio of current assets over current liabilities as well as relatively high operating margins with the lowest return – 8.6% from SBCWD – exceeding the corresponding inflation rate by more than triple in the San Francisco Bay Area region.⁴⁴ However, and in contrast to the preceding comments, half of the agencies – SBCWD, MMWD, and NMWD – finished with relatively high debt-to-net asset ratios by all approaching 50%; a standard demarcation in which agencies financial flexibility becomes restricted in funding new infrastructure needs and deficiencies due to existing debt levels.

All six affected agencies finished the five-year review period in generally good position with respect to liquidity and profitability with all finishing with current ratios of no less than 4 to 1 and operating margins that exceed local inflation rates. Three of the agencies – SCBWD, MMWD, and NMWD – however finished with relatively high debt ratios that approach 50% of their respective net assets.

⁴⁴ The consumer price index from 2012 and 2013 increased by 2.7% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.

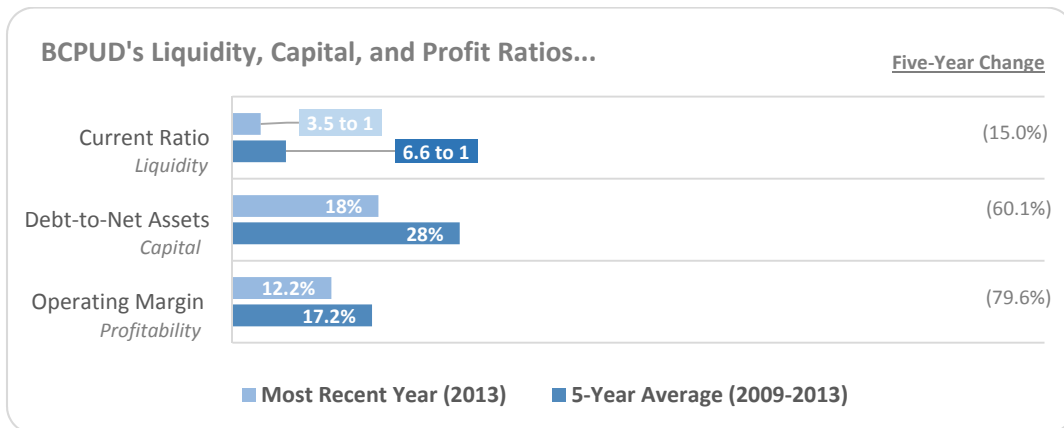
Trends among individual agencies over the study period has significantly varied with respect to measuring liquidity, capital, and margin; i.e., the agencies' financial standing has stayed dynamic and generally changed from year-to-year. The most dynamic measurement has involved debt-to-net assets ratios with five of the six agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – all experiencing more than one-third changes (increases and decreases) over the preceding five-year period. Operating margins have also been dynamic with three of the agencies – IPUD, MBCSD, and SBCWD – all generating increases of more than 100%.





Bolinas Community Public Utility District

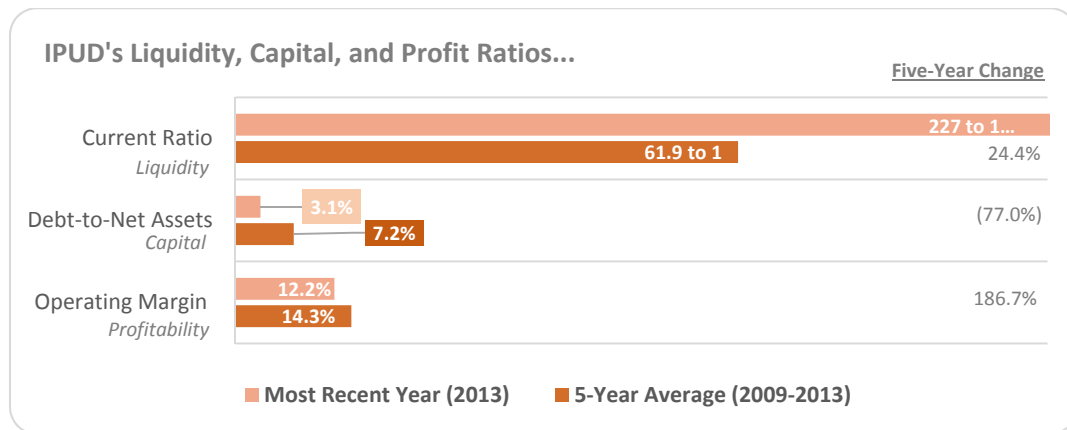
BCPUD’s five-year averages during the course of the study period showed the District finished with relatively good liquidity and better capital and profit ratios despite experiencing negative trend changes in two of the three measured categories (current ratio and operating margin). Most notably, BCPUD improved its capital standing by reducing its long-term indebtedness by over one-half over the five-year period and ending with a relatively low debt-to-net asset ratio of 18%. BCPUD’s liquidity levels, in contrast, decreased by 15% over the study period as a result of escalating short-term debt obligations, but the District still finished the review period with current assets outpacing current liabilities by over 3 to 1.



Inverness Public Utility District

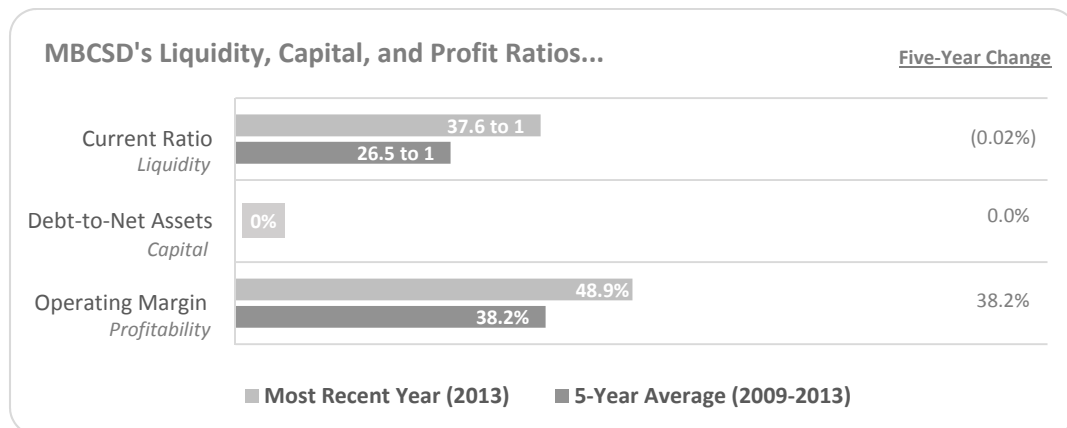
IPUD’s five-year averages during the course of the study period showed the District finished with exceptionally high liquidity and good capital and profit ratios with all three measurement categories experiencing positive trend changes. This includes persistent and increasing gains in profitability with a near triple gain in operating margin as well as improved capital by reducing long term obligations by nearly four-fifths and ending with a notably low debt-to-net asset ratio of 3%. IPUD’s liquidity

also remained relatively high throughout the first four years before spiking even higher to a current ratio of 227 to 1 by the final year with the near elimination of short-term obligations.



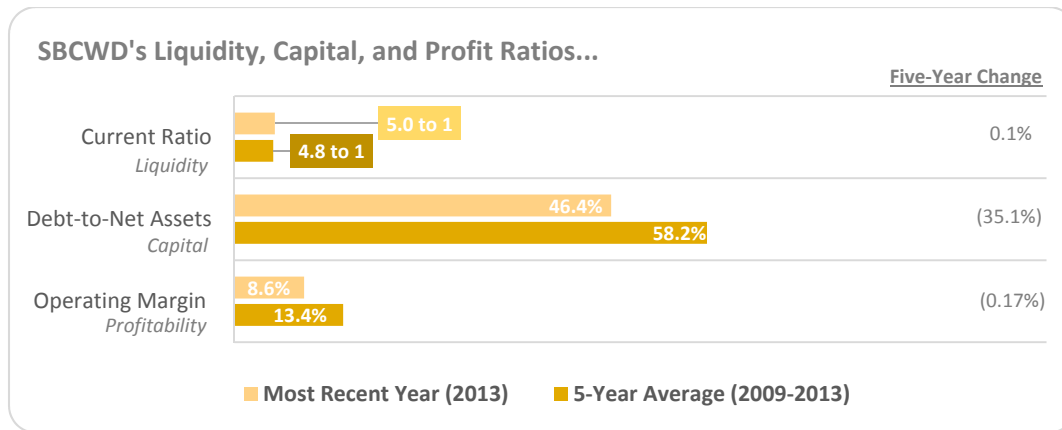
Muir Beach Community Services District

MBCSD’s five-year averages during the course of the study period showed the District finished with relatively high liquidity and profit ratios as well as incurring no long-term debt. The current ratio, pertinently, averaged 26 to 1 and ended the period at 37 to 1 with the expectation MBCSD would draw down on its cash equivalents to self-fund a major water line in the near future. MBCSD also continued to improve its profitability by more than doubling its year-end net over the study period with four of the five years achieving close to a 50% operating margin.



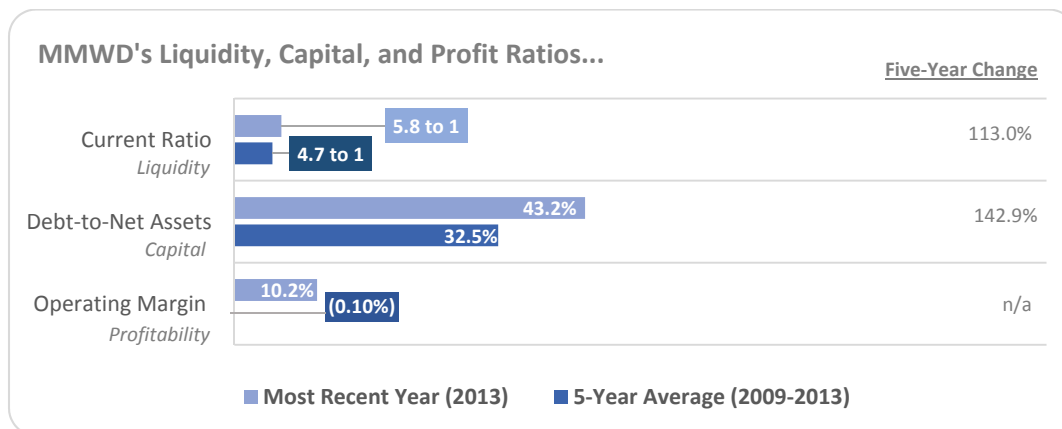
Stinson Beach County Water District

SBCWD’s five-year averages during the course of the study period showed the District finished with moderate liquidity and profit ratios that remained relatively stagnant over the five-year period. This includes finishing the five-year period with a current ratio of 5 to 1 and an operating margin of 8.6%. SBCWD’s long-term debt totals remained relatively high and finished with a debt-to-net assets ratio of close to 50% despite cutting over one-third during the five-year period.



Marin Municipal Water District

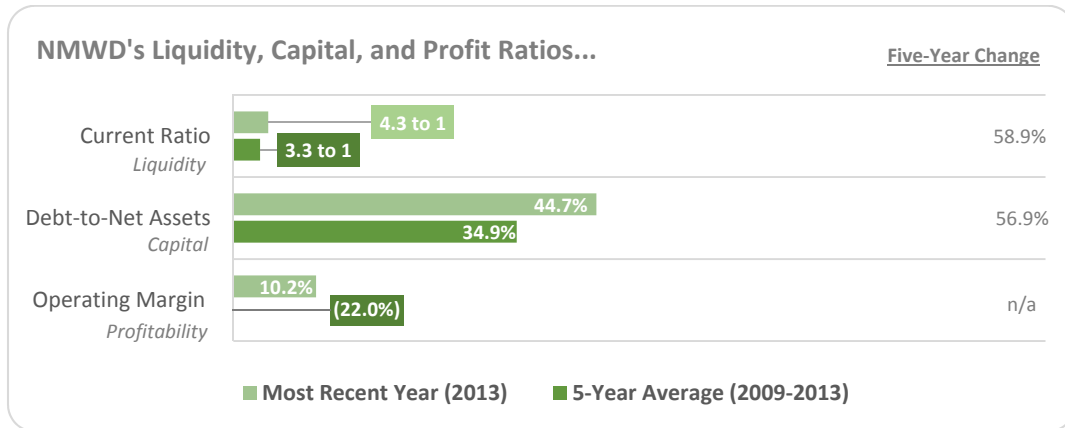
MMWD’s five-year averages during the course of the study period showed the District finished within improved measurements with respect to liquidity and profit while concurrently experiencing a significant increase in long-term debts. This includes MMWD expanding the value of near-term assets over near-term liabilities by more than double and finishing the period with a current ratio of 5.8 to 1. MMWD also incrementally eliminated an operating deficit with the aid of the District enacting a rate increase beginning in 2012 that helped produce a final operating margin of 10.2%. MMWD did experience, though, a significant decrease in capital as a result of new long-term debt obligations and marked by increasing its debt-to-equity level by more than double and finishing the period with a debt-to-net asset ratio of 43.2%.



North Marin Water District

NMWD’s five-year averages during the course of the study period showed the District finished within improved liquidity and profitability while concurrently experiencing a sharp rise in long-term debt. This includes NMWD expanding the value of near-term assets over near-term liabilities by almost 60% and finishing the review period with a current ratio of 4.3 to 1. NMWD also incrementally eliminated a persistent operating deficit by the end of the study period with the aid of the District enacting three consecutive rate increases and finishing the period within its first positive

operating margin ratio totaling 10.9%. NMWD did experience, nonetheless, a significant decrease in capital as a result of new long-term debt obligations and marked by finishing with a relatively high debt-to-equity ratio of 45%.

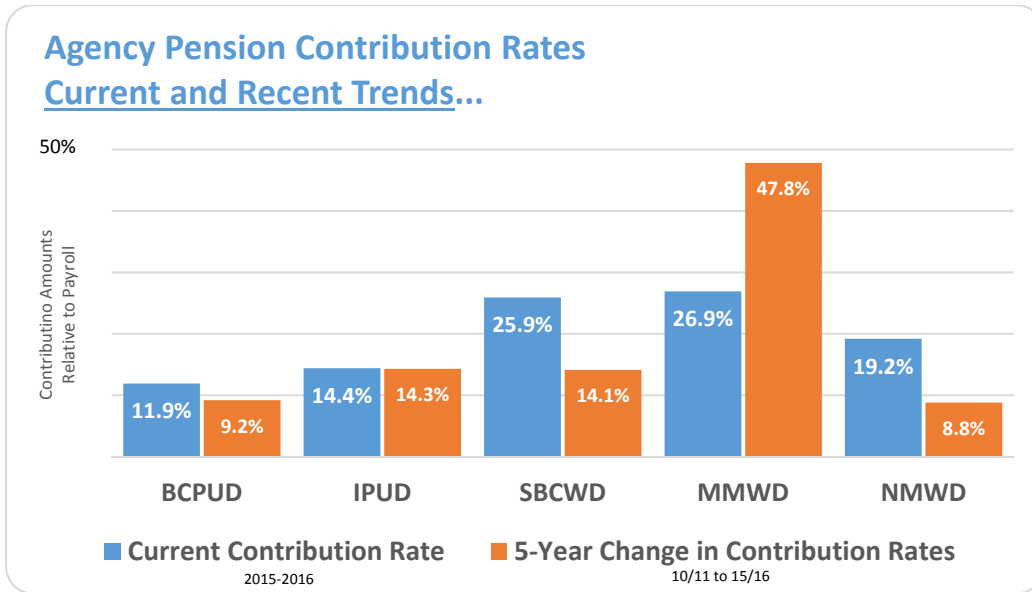


3.0 Pension Obligations

Five of the six affected agencies have contractual pension obligations with the lone exception involving MBCSD. All existing pension contracts for the five subject agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – are with the California Public Employees' Retirement System (CalPERS) and provide relatively similar benefits to their employees. This includes providing eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries based on the terms of the agency contracts with CalPERS. Agency funding contributions are non-discretionary and based on employee salary totals and determined each year by CalPERS through actuarial updates. All mandatory contribution rates – which are separate from any cost-sharing arraignments between the agencies and its employees – have increased between 2010 and 2015 fiscal years by an average of 18.2% and exceeds the corresponding inflation change for the region by nearly one-half with the single largest increase occurring for MMWD at 47.8%.⁴⁵

Five of the six affected agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – have existing pension obligations through separate contracts with CalPERS. These contracts include mandatory contributions based on annual actuarial reports prepared by CalPERS with the corresponding rate collectively increasing over the most recent five-year period (2010-2015) by an approximate 20% average.

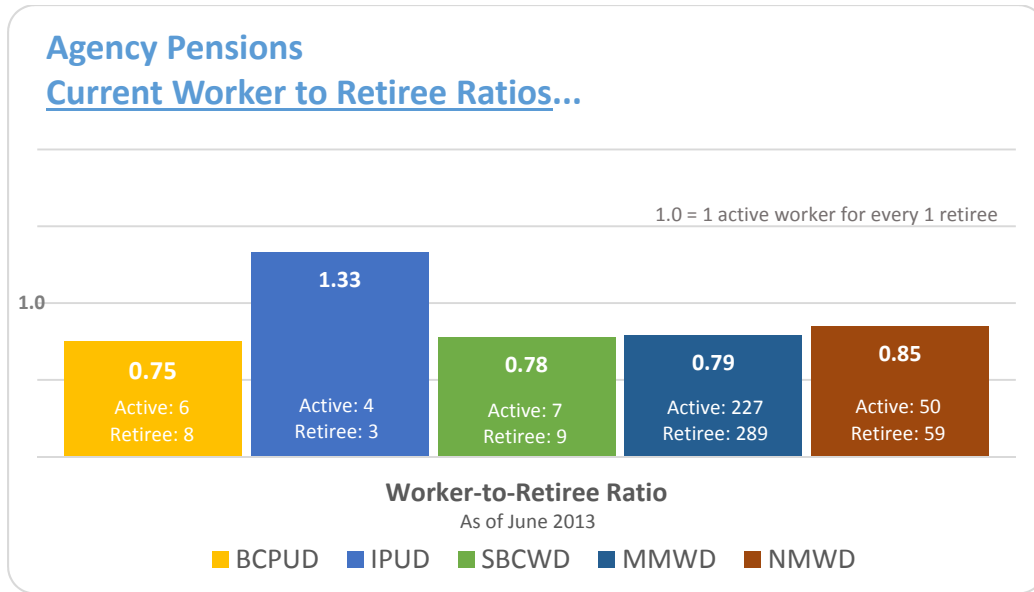
⁴⁵ The consumer price index from 2009 and 2014 increased by 12.3% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.



All agencies maintain at least two contract tiers with CalPERS that range in defined benefits from a high of 2.7 at 55 to a low and now standard allowance byway of new State law for nearly all public agencies of 2.0 at 62; the latter providing an eligible retiree with 20 years of total service credit 40% of their highest average salary over a three year period beginning at age 62. The total number of vested employees (i.e., those with at least five years of service credit) combined between the five subject agencies is 788 with over three-fourths tied to MMWD along with a combined active-to-retiree ratio of 0.79 to 1:00 as of the end of the study period; the latter producing an overall imbalance with approximately four active employees currently contributing to the pension system for every five retired employees.⁴⁶

The combined active-to-retiree ratio between the five subject agencies is 0.79 to 1:00 as of the end of the study period; an amount meaning there are approximately four active employees contributing to the pension system for every five retired employees.

⁴⁶ Participant information is as of June 2013 and represents the most recent information available from CalPERS.



Actual pension contribution have increased for four of the five subject agencies based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS as of date. The combined increase over this most recent three-year period for the four subject agencies that experienced rises in pension costs – BCPUD, IPUD, SBCWD, and NMWD – totaled 19.0% or \$0.206 million and nearly three times greater than the corresponding inflation rate for the San Francisco Bay Area region with the lowest individual rise equaling 13.5% (BCPUD).⁴⁷ The remaining agency – MMWD – was the only of the five experiencing an actual decrease in pension contributions over the three-year period by (9.4%) or \$2.1 million due despite a parallel rise in liability as noted below and tied to an overall decrease in wages.

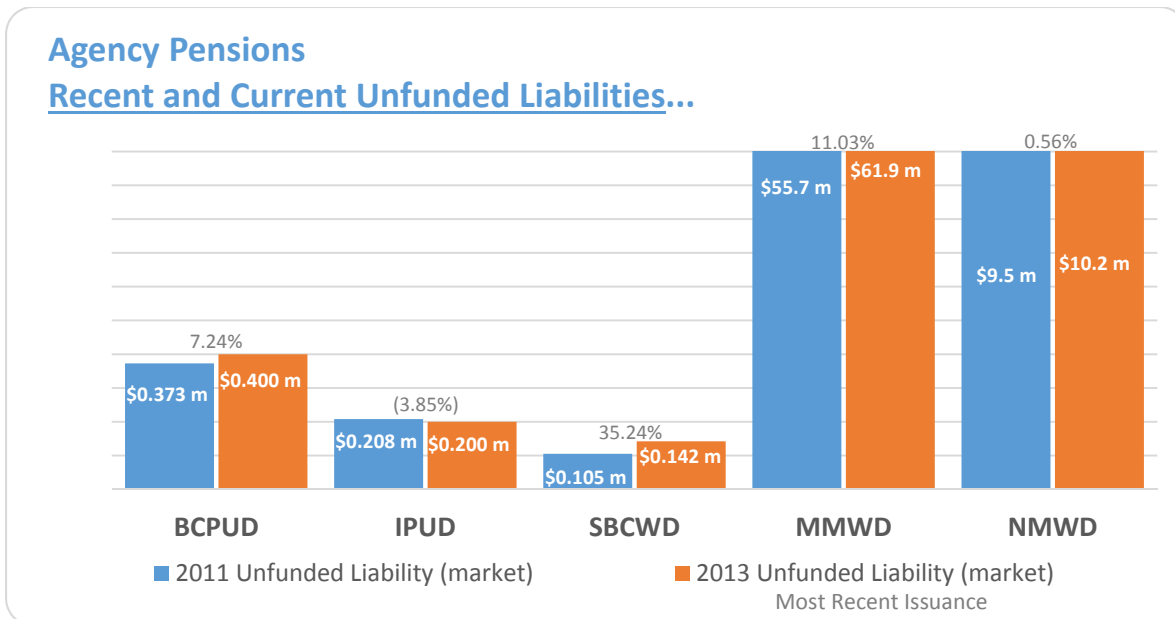
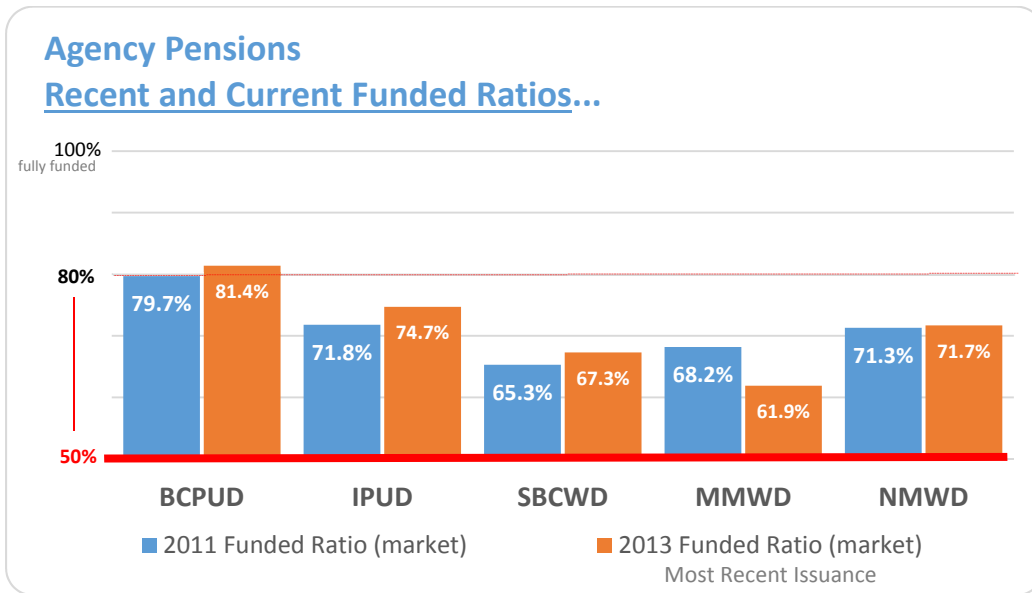
Four of the five subject agencies – BCPUD, IPUD, SBCWD, and NMWD – have experienced no less than a 13.5% increase in the actual pension costs over the last three available years of documentation (2011-2013); a change that is nearly three times greater than the corresponding inflation rate for the region.

None of the five subject agencies with pension obligations are fully funded. Four of the five agencies funded status – the difference between the pension plan’s assets and liabilities – also fell below the 80% standard threshold used in identifying relatively stable pension plans as of the last CalPERS report. The referenced increases in recent contributions for BCPUD, IPUD, SBCWD, and NMWD have improved these four agencies’ funded status over the three-year review window, albeit modestly and proportionally less

Only BCPUD has a funded status above 80% as of the last report issuance by CalPERS; the standard threshold used in identifying relatively stable pension plans.

⁴⁷ The consumer price index from 2010 and 2013 increased by 5.0% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.

than the rise in contributions between 0.5% to 4.0%. The most recent funded ratios for these four agencies based on market calculations ranges from a low of 67% for SBCWD to a high of 81% BCPUD.⁴⁸ MMWD’s funded ratio has decreased in step with its lower contributions over the three-year window by (9.2%) and finished at 62%. The overall unfunded liability – pension monies owed that are not covered by assets – combined among all five subject agencies has increased by 10.4% or \$6.8 million between 2011 and 2013 with 90% belonging to MMWD.



⁴⁸ CalPERS no longer provide actuarial calculations for funded status or unfunded liability for reporting purposes due to changes in accounting standards. Nonetheless, and as a standard planning tool based on prior estimates, it is reasonable to project actuarial calculations generally provide a five to seven point increase over market calculations.

Bolinas Community Public Utility District

BCPUD's total annual pension contributions have risen by 13.5% from \$0.037 million to \$0.042 million over the most recent three-year review window (2011-2013). These raised contributions have helped to modestly improve BCPUD's funded ratio by 2.1% and ended the period at 81.4% (market); the highest ratio among all five subject agencies. However, BCPUD's unfunded liability, however, also increased by 7.2% from \$0.373 million to \$0.400 million; an amount equal to 24.1% of the District's undesignated fund balance as of the start of 2013-2014. BCPUD's worker-to-retiree ratio finished the period at 0.75 to 1.0.

BCPUD's funded ratio has improved by 2.1% over the last three reported years finishing at 81.4%; the highest ratio among the five subject agencies.

BCPUD's Pension Obligations

Table 3-24 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	\$0.037 million	\$0.042 million	13.5%
Funded Ratio - Market	79.7%	81.4%	2.1%
Unfunded Liability - Market	\$0.373 million	\$0.400 million	7.2%
Active to Retiree Ratio	0.54	0.75	38.9

Inverness Public Utility District

IPUD's total annual pension contributions have risen by 33.3% from \$0.027 million to \$0.036 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to moderately improve IPUD's funded ratio by 4.0% and ended the period at 74.7% (market). IPUD's unfunded liability has also correspondingly decreased by (3.8%) from \$0.208 million to \$0.200 million; an amount equal to 83.0% of the District's undesignated fund balance as of the start of 2013-14. IPUD's worker-to-retiree ratio finished the period at 1.3 to 1.0.

IPUD's funded ratio has improved by 4.0% over the last three reported years finishing at 74.7%; the second highest ratio among the five subject agencies.

IPUD's Pension Obligations

Table 3-25 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	\$0.027 million	\$0.036million	33.3%
Funded Ratio - Market	71.8%	74.7%	4.0%
Unfunded Liability - Market	\$0.208 million	\$0.200 million	(3.8%)
Active to Retiree Ratio	1.7	1.3	(23.5%)

Stinson Beach County Water District

SBCWD's total annual pension contributions have risen by 35.2% from \$0.105 million to \$0.142 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to moderately improve SBCWD's funded ratio by 3.1% and ended the period at 67.3%. SBCWD's unfunded liability nonetheless also increased by 6.5% from \$1.086 million to \$1.157 million; an amount equal to 87.0% of the District's undesignated fund balance as of the start of 2013-2014. SBCWD's worker-to-retiree ratio finished the period at 0.77 to 1.00.

SBCWD's funded ratio has improved by 3.1% over the last three reported years finishing at 67.3%; the lowest ratio among the five subject agencies.

SBCWD's Pension Obligations

Table 3-26 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	\$0.105 million	\$0.142 million	35.2%
Funded Ratio - Market	65.3%	67.3%	3.1%
Unfunded Liability - Market	\$1.086 million	\$1.157 million	6.5%
Active to Retiree Ratio	1.0	0.77	(23.0%)

Marin Municipal Water District

MMWD's total annual pension contributions have decreased by (9.4%) from \$22.3 million to \$20.2 million over the most recent three-year review window (2011-2013). This decrease in contributions has contributed to MMWD's funded ratio slightly lowering by (0.9%) and ended the period at 67.6%. MMWD's unfunded liability also increased by 10.9% from \$55.7 million to \$61.9 million; an amount equal to 159% of the District's undesignated fund balance as of the start of 2013-2014. MMWD's worker-to-retiree ratio finished the period at 0.78 to 1.00.

MMWD's funded ratio has declined by (0.9%) over the last three reported years finishing at 67.6%; the second lowest ratio among the five subject agencies.

MMWD's Pension Obligations

Table 3-27 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	\$22.3 million	\$20.2 million	(9.4%)
Funded Ratio - Market	68.2%	67.6%	(0.9%)
Unfunded Liability - Market	\$55.7 million	\$61.9 million	10.9%
Active to Retiree Ratio	0.93	0.78	(16.1%)

North Marin Water District

NMWD's total annual pension contributions have increased by 17% from \$0.913 million to \$1.068 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to slightly improve NMWD's funded ratio by 0.6% and ended the period at 71.7%. NMWD's unfunded liability, however, continued to increase by 7.4% from \$9.5 million to \$10.2 million; an amount equal to 78% of the District's undesignated fund balance as of the start of 2013-2014. NMWD's worker-to-retiree ratio finished the period at 0.84 to 1.00.

NMWD's funded ratio has improved by 0.6% over the last three reported years finishing at 71.7%; the lowest ratio among the five subject agencies.

NMWD's Pension Obligations

Table 3-28 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	\$0.9 million	\$1.0 million	17.0%
Funded Ratio - Market	71.3%	71.7%	0.6%
Unfunded Liability - Market	\$9.5 million	\$10.2 million	7.4%
Active to Retiree Ratio	1.0	0.84	(16.0%)

CHAPTER FOUR

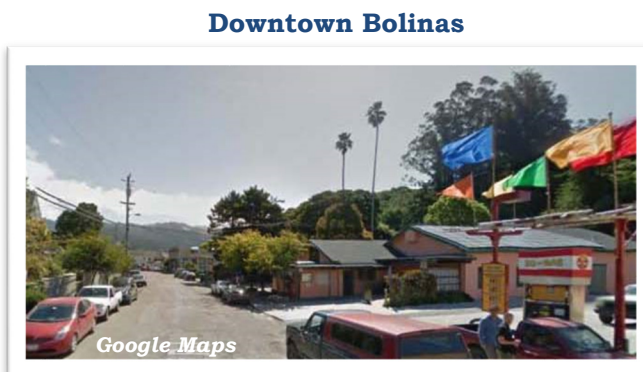
AGENCY PROFILES

4.1 WEST MARIN REGION

A. BOLINAS COMMUNITY PUBLIC UTILITY DISTRICT

1.0 Overview

The Bolinas Community Public Utility District (BCPUD) was formed in 1967 and encompasses an approximate 2.6 square mile jurisdictional boundary along Marin County’s western shoreline and set upon a short peninsula. Governance is provided by a five-person board with members directly elected by registered voters and serve staggered



four-year terms. Access to BCPUD’s jurisdictional boundary is limited to Olema-Bolinas Road located off of State Highway 1. The community is approximately 18 miles from the nearest incorporated community, Mill Valley, and lies in the Bolinas-Stinson Beach Elementary and Tamalpais Union High School Districts with students assigned absent of transfer to Tamalpais High.

BCPUD is organized as a multi-purpose agency and provides five distinct services: (a) potable water; (b) wastewater; (c) solid waste; (d) drainage; and (e) parks and recreation. Existing development is concentrated within two southern areas that make up close to one-half of BCPUD and termed “Big Mesa” and “Little Mesa.” The remaining one-half of the jurisdictional boundary in the north is largely undeveloped and/or underdeveloped with a considerable portion in the Point Reyes National Seashore. Markedly, and since 1971, BCPUD

Bolinas CPUD

Formation Date	1967
Enabling Legislation	Public Utilities Code Section 15501 et. seq.
Service Categories	Potable Water Solid Waste Wastewater Drainage Parks and Recreation
Population	1,574
Registered Voters	838
Current Buildout Population Estimate	1,784

has maintained a moratorium on new water service connections following the Board’s declaration of a shortage. All potable water supplies are locally drawn with Arroyo Hondo Creek serving as BCPUD’s primary source. The average annual water demand for BCPUD over the study period has been 37.8 million gallons or 115.9 acre-feet and represents a daily capita use of 66 gallons.⁴⁹

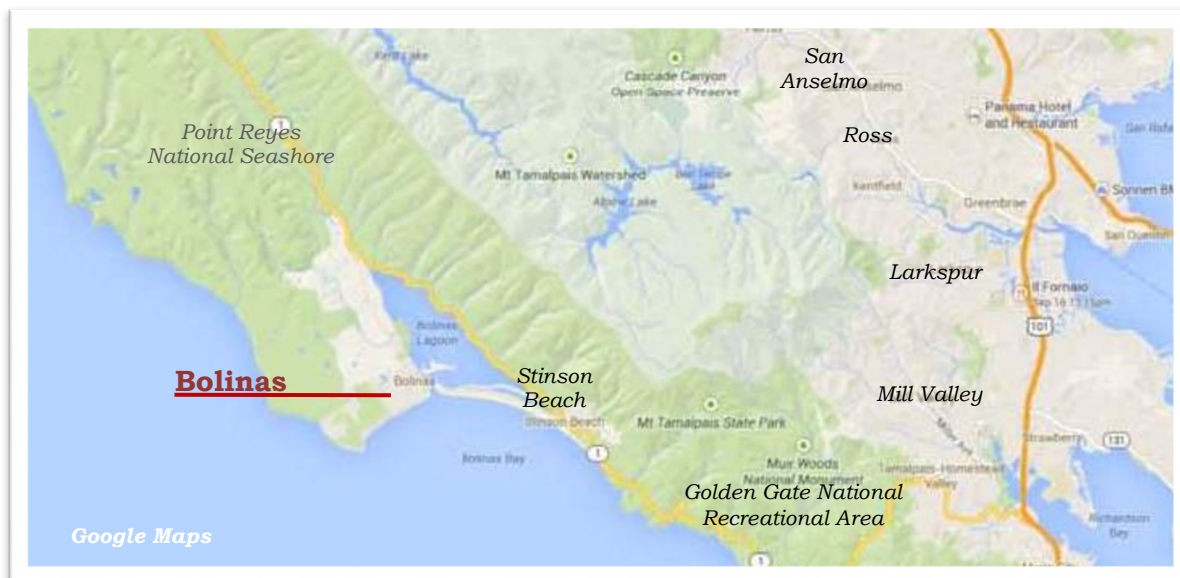
⁴⁹ This amount is drawn from total water production between 2009 and 2013 and calculated using the Commission’s own resident population projections for BCPUD.

BCPUD’s service area – collectively referenced to as “Bolinás” – is one of 20 formally defined unincorporated communities in Marin County. The estimated resident total within BCPUD counting both fulltime (935) and part-time (639) is estimated by the Commission at 1,574 as of the term of this study period. The projected buildout population as calculated by the Commission and based on current planning policies of the County of Marin within BCPUD is estimated at 1,784.⁵⁰ Registered voters currently total 838 and represents 53% of the estimated population. The adopted operating budget at the term of the study period was \$1.488 million with funding for the equivalent of 5.0 employees. The unrestricted fund balance was \$0.921 million and sufficient to cover seven months of general operating expenses based on the 2013-2014 budget.

2.0 Background

2.1 Community Development

Bolinás’ present-day service area began developing in 1840s in step with its western neighbor Stinson Beach with the inclusion of the coastal area in an approximate 9,000-acre land grant – Rancho Baulines – from Mexico to local Gregorio Briones.⁵¹ The community’s initial development was fast-tracked by logging activities in and around the area as the native redwood trees proved profitable in the aid of San Francisco’s development. Lumber mills were established with make-shift housing going into logged areas and the early-makings of a commercial district along the shoreline were underway by the 1850s; the latter marked by the opening of the Ocean House Hotel in 1853. It was also at this time the name Bolinás was used for the area.



⁵⁰ Current and projected service populations – including buildout – are detailed in Section 4.1.

⁵¹ Background information is principally drawn from prior LAFCO reports and substantively supplemented from Imagine of America’s *Bolinás and Stinson Beach* (Bolinás Museum and the Stinson Beach Historical Society).

Bolinas' early development evolved by the 1860s to accommodate an increasing number of year-round residents and included the construction of churches, schools, and permanent residential structures. The first residential subdivision map – “Granda Vista” and later termed Little Mesa – was filed in 1872 by Frank Waterhouse and created approximately 70 lots on the eastside near the developing downtown area along Brighton Avenue. Eventually, and in concert with the construction of the first year-round road connecting to Mill Valley, a second and larger subdivision map – Big Mesa or “Gridded Mesa” – was filed in 1927 and involved the creation of over 5,000 2,000-square foot lots (each 20 feet wide by 100 feet long) along the westside and highlighted by a conventional street grid pattern.

Organized community services within Bolinas commenced with the establishment of Sanitary District No. 3 in 1908 to provide wastewater collection and disposal for Little Mesa and the surrounding downtown/harbor areas. Water services were initially organized by a private company in the late 1920s as part of the Big Mesa subdivision and marked by building a dam on nearby Arroyo Hondo Creek. Water services for the community were subsequently assumed by two voter-approved districts: Bolinas Beach Public Utility District in 1927 to serve Big Mesa and the Bolinas Public Utility District in 1935 to serve Little Mesa and the downtown/harbor areas. The formation of the Bolinas Public Utility District also involved the merger and acquisition of wastewater services from Sanitation District No. 3.

By the 1950s, Bolinas' development began to accelerate as vacant lots within Big Mesa provided a ready supply for the growing demand for single-family homes in West Marin. The resulting influx of year-round residents to Bolinas promoted the conversion of the volunteer fire company into the Bolinas Fire Protection District in 1954 and engendered plans by the County of Marin for new development to respond to the area's increasing popularity. These plans were highlighted by the targeted development of a mixed residential, commercial, and recreation project for the Bolinas Lagoon; an approximate 1,000 acre inlet bordered west and east by Bolinas and Stinson Beach, respectively. The development was memorialized as part of “Bolinas-Stinson Beach Master Plan” approved by the County along with the formation of the area-wide Bolinas Harbor District in 1957. However, after a specific project was filed by a developer under the auspice of the plan, widespread pushback from many stakeholders proved significant and the application to develop Bolinas Lagoon was withdrawn by the mid-1960s.

2.2 Formation Proceedings

The formation of BCPUD was completed in 1967 as the successor agency to the merger of the Bolinas Beach Public Utility District and the Bolinas Public Utility District. The Commission approved the formation at the joint request of the two agencies to consolidate municipal services within Bolinas under one governing body with the expectation a second reorganization involving the Bolinas Fire Protection District would

occur thereafter. Approval coincided with LAFCO authorizing BCPUD with five specific service powers: (a) domestic water; (b) wastewater; (c) solid waste; (d) drainage; and (e) parks and recreation.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by BCPUD and/or affecting the District's service area following formation in 1967 is provided below.

- 1960s • LAFCO approved a joint consolidation application by BCPUD and the Bolinas Fire Protection District in 1968. The consolidation – which would have dissolved the Bolinas Fire Protection District and transferred all assets and liabilities to BCPUD – was later terminated as conditions lapsed after an apparent disagreement emerged between LAFCO and BCPUD involving the allocation of property taxes.
- LAFCO approved an application by the County of Marin to dissolve the Bolinas Harbor District in 1969. The dissolution of Bolinas Harbor District – which included all of BCPUD – was approved by voters and marked a prominent change in land use and service planning by the County and effectively terminated the Bolinas-Stinson Beach Master Plan by eliminating the conduit to finance and operate the necessary public work improvements for the 22,000 acre project site.
- 1970s • An oil spill in the San Francisco Bay in January 1971 resulting from two tankers colliding reached the Bolinas shoreline and is attributed with cementing the community's outward orientation towards environmental and natural habit protection.
- BCPUD approved a moratorium on new water connections in November 1971 following an assessment of its water supply and a declaration of a water shortage emergency. The moratorium subsequently was upheld against several legal challenges, including a suit filed by the Pacific Legal Foundation wherein the reviewing court denied the merits of the plaintiffs' claims and found the District had a "solid factual basis for declaring the emergency."
- BCPUD responded to an order from the State of California to cease disposing of wastewater effluent in the Bolinas Lagoon by completing work on a lift station, force main, and wastewater treatment facility along with disposal spray-fields in 1975. This project included the acquisition of 90 acres of land for a pond system and funded by a 1973 voter approved \$0.144 million bond. The new treatment facility included the construction of an intergraded pond system premised on biological aeration and the use of no chemicals.

- The County adopted the Bolinas Community Plan in December 1975. The Community Plan was updated in 1983 and again in 1997 and serves as the key visioning document in prescribing desired land use and related management policies. The document anticipates a build out of 815 total dwelling units with most of the future development occurring among vacant lots in Big Mesa. It also includes explicit policy statements that Bolinas “remain off the beaten track” and that “all living organisms and land forms exist in rare form in Bolinas and the planning process shall attempt to understand, protect, and engender these elements of community.”
1970s
- BCPUD completed construction on a new water treatment plant with microfiltration technology to reduce the need for chemical treatment of the water in 1996. The construction of the plant was funded by a low interest loan by the State of California.
1990s

2.4 Previous Municipal Service Review

The Commission’s inaugural municipal service review of the BCPUD was completed in October 2007 as part of a regional study on the Bolinas area.⁵² This initial municipal service review provided a baseline evaluation of BCPUD and its water and sewer services and concluded the District appeared to be operating in a fiscally sound manner relative to local conditions. The initial municipal service review did note BCPUD continued to be in a water shortage emergency due to a limited supply. The initial municipal service review also briefly examined the potential for consolidating BCPUD and the Bolinas Fire Protection District noting certain governance advantages, but ultimately did not recommend a consolidation deference to additional review in a future study.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

BCPUD’s jurisdictional boundary is approximately 2.6 square miles in size and covers 1,649 unincorporated acres with close to one-fifth (350 acres) included in the Point-Reyes National Seashore. Overall there are 1,168 legal parcels within BCPUD based on County Assessor records. Ownership of these parcels is divided between 94.3% private and 5.7% public/non-profit titleholders with the latter category accounting for three-fifths of all jurisdictional acres (including public right-of-ways). Total assessed value (land and structures) within BCPUD is presently \$278.4 million as of January 2015.

BCPUD’s jurisdictional boundary spans 2.6 square miles with a current total assessed value of \$278.4 million; the latter of which represents an estimated per capita value of \$0.176 million.

⁵² The other agency in the municipal service review was the Bolinas Fire Protection District.

The portion of BCPUD’s jurisdictional boundary under private ownership is close to three-fifths built-out with 589 of the 1,102 affected parcels already developed according to County Assessor records. Remaining development potential within BCPUD appears limited to 116 un-built parcels that are at least 0.23 acres in size and meet the County’s lowest and most prevalent minimum density requirement under the County within BCPUD. The County has separately tallied a total buildout potential under existing zoning of 75 new residential units – an amount that takes into account second units as well as setback and other access limitations – in BCPUD as part of their 2015-2023 Housing Element.

BCPUD’s Jurisdictional Boundary Characteristics	
Table West Marin C-1 (Source: Marin LAFCO)	
Total Jurisdictional Acreage.....	1,649
Total Jurisdictional Parcels.....	1,168
- Number of Parcels Under Private Ownership / Total Acres.....	1,102 / 957.5
- Number of Parcels Under Public – Non Profit Ownership / Total Acres.....	66 / 509.5
- Total Number of Public Right-of-Way Acreage.....	181.9
- Percentage of Parcels Under Private Ownership Developed.....	55.1
- Percentage of Parcels Under Private Ownership Undeveloped.....	44.9
Total Number of Registered Voters.....	838
Total Assessed Value.....	\$278.478 m

Notes to Boundary Characteristics Table:

- 1) There are 51 parcels within BCPUD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

BCPUD’s jurisdictional boundary has remained unchanged with no recorded boundary changes since the District’s formation in 1967.

3.3 Sphere of Influence

BCPUD’s sphere of influence was established by the Commission in December 1984. The established sphere was purposely set to match BCPUD’s entire 1,649 acre jurisdictional boundary with no additional lands.⁵³ (This includes the purposeful exclusion approximately 310 acres of land owned by the United States and assigned to the Point Reyes National Seashore that lies in the middle of BCPUD’s jurisdictional boundary.) The Commission also included a policy statement in its 1984 review recommending for the consolidation of BCPUD with the Bolinas Fire Protection District.

BCPUD’s sphere is coterminous with the District’s jurisdictional boundary; i.e., this baseline suggests no expansion of the jurisdictional boundary is expected as of the last update in 2007.

⁵³ BCPUD’s established sphere of influence was approved by the Commission three-to-two with both county members casting the dissenting votes given the inclusion of the referenced recommendation to consolidate BCPUD and BFPD.

The Commission updated the sphere in October 2007 consistent with CKH and its regular review requirement, but no recommendations for consolidation were included.

3.4 Outside Services

BCPUD reports it does not provide any services – and specifically water – outside its existing jurisdictional boundary.

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

BCPUD’s current total resident population (fulltime and part-time) within its jurisdictional boundary is estimated by the Commission at 1,574 as of the term of study period.⁵⁴ This projection also indicates BCPUD is at

LAFCO estimates there are 1,574 total residents within BCPUD as of the term of this study and means the District is at 89% resident buildout.

⁵⁴ California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid combining the second and third options is appropriate for purposes of this review and involves the number of BCPUD residential service connections - 562 - multiplied by 2.8 to produce 1,574.

88.8% with regard to its projected resident buildout total of 1,784.⁵⁵ The current resident population estimate is based on a modified calculation provided under State law specific to public water systems. County records show there have been five “new” residential units constructed within BCPUD over the study period. BCPUD contends these new units are presumably replacement residences given the existing moratorium on water connections. BCPUD also contends there have been no substantive changes in the District’s service population over the study period.

With respect to making projections going forward, and for purposes of this review, it is reasonable to assume BCPUD’s resident population will remain stagnant at 1,574 through 2023. This assumption is predicated on the existing moratorium on new water service connections holding and is irrespective of potential population changes tied to younger families moving into the community. This assumption also means BCPUD will remain at 88% relative to the current planned buildout of its service area. These collective projections – past, current, and future – are summarized below.

LAFCO Population Estimates for BCPUD				
Table 4-1 (Marin LAFCO)				
2009	2013	2018	2023	Annual Trend
1,574	1,574	1,574	1,574	0.0%

* Given the current moratorium, future population increases are likely limited to the addition of second units and/or construction of new homes with private wells.

4.2 Residency Type



The Commission projects BCPUD’s current estimated residential total of 1,574 is divided between 935 fulltime and 639 part-time residences as of the term of the study period.⁵⁶ This projection – which is premised on the assumption of limited rental properties in BCPUD – indicates 59% of the District’s residents are year-round and increases by two-thirds during peak weekend and summer periods. BCPUD also reports this referenced split between fulltime and part-time residences is expected to narrow as the majority of home sales in recent years have been to persons seeking second homes.

⁵⁵ The current buildout projection for BCPUD of 1,784 is drawn from identifying the number of new units – 75 – that could be accommodated within the District based on the current County of Marin Housing Element and multiplied by a factor of 2.8. Actual construction is subject to external factors and highlighted by the status of the moratorium on water service connections and permit approvals from the County.

⁵⁶ This projection has been calculated by the Commission and based on multiplying the total number of units assigned to all developed residential lots within BCPUD with local ownership mailing addresses – 334 – by an occupancy factor of 2.8 to produce 935; the latter amount producing a 59.4% to 41.6% split between fulltime and part-time residents.

4.3 Social and Economic Indicators

A review of recent demographic information for the Bolinas community covering the study period indicates fulltime residents are relatively older and with significantly lower incomes compared to countywide averages. This information is drawn from census data collected between 2005 and 2012 and shows Bolinas residents have experienced a notable decline in their economic standing with close to a one-tenth decrease in the median household income along with – and most striking – a one-half rise in the percent of persons living under the poverty rate during this period. Moreover, the community’s poverty rate of 26.7% as of the last census issuance is more than three times higher than the average percent for the entire county.

Bolinas’ fulltime residents are generally at an economic disadvantage compared to countywide averages based on median household income and poverty rate discrepancies. The rate of these discrepancies is also escalating and marked by a one-half increase in the number of persons living under the poverty rate over the last several years.

BCPUD’s Resident Trends in Social and Economic Indicators				
Table 4-2 (Marin LAFCO / American Community Surveys)				
Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Avg.
Median Household Income	\$60,096	\$54,635	(9.1%)	\$90,962
Median Age	49.3	48.3	(2.0%)	44.6
Prime Working Age (25-64)	73.8%	76.9%	4.2%	56.6%
Unemployment Rate (Labor Force)	9.8%	7.4%	(2.4%)	4.5%
Persons Living Below Poverty Rate	16.8%	26.7%	58.9%	7.5%
Mean Travel to Work	30.7 minutes	31.1 minutes	1.3%	28.4 minutes
Adults with Bachelor Degrees or Higher	55.0%	27.2%	(50.5%)	54.6%
Male	59.6%	48.7%	(18.3%)	49.2%
Female	40.4%	51.3%	27.0%	50.8%
White / Non Hispanic	86.0%	86.6%	0.01%	73.1%
Hispanic	7.4%	2.3%	(69.1%)	15.3%
Other	6.6%	11.1%	68.2%	11.6%

5.0 Organizational Structure

5.1 Governance

BCPUD’s governance authority is codified under the Public Utilities Act of 1913 (“principal act”) and empowers the District to provide a moderate range of municipal services upon approval by LAFCO. BCPUD – which is currently one of 54 public utility districts operating currently in California – is presently authorized to provide six specific services within its jurisdictional boundary: (a) potable water; (b) non-potable; (c) wastewater; (d) parks and recreation; (e) drainage; and (f) solid waste (garbage). All other

latent powers enumerated under the principal act would need to be activated by LAFCO before BCPUD would be allowed to initiate.

BCPUD’s governance authority is codified under the Public Utilities Act of 1913 (“principal act”) and empowers the District to provide a moderate range of municipal services upon approval by LAFCO. BCPUD – which is currently one of 54 public utility districts operating currently in California – is presently authorized to provide five specific services within its jurisdictional boundary: (a) potable water; (b) wastewater; (c) parks and recreation; (c) drainage; and (e) solid waste (garbage).⁵⁷ All other latent powers enumerated under the principal act would need to be activated by LAFCO before BCPUD would be allowed to initiate.

LAFCO approval is needed for BCPUD to activate a latent power or divest itself from an existing service power.

A list of active and latent power authorities under the principal act for BCPUD follows.

Active Service Powers

- potable water services
- wastewater services
- solid waste/garbage
- parks/recreation
- drainage

Latent Service Powers

- transportation
- power (light and heat)
- fire protection
- telephone/communication
- street lighting

BCPUD has been governed since its formation in 1967 as an independent special district with five registered voters comprising a five-member governing board. Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating president system and receive a \$250 monthly director fee. The Board currently meets on the third Wednesday of each month at 7:30 P.M. at the District’s Administrative Office located at 270 Elm Road in Bolinas. A listing of Board members as of January 2015 along with respective backgrounds and years served follows.

BCPUD Board Roster			
Table 4-3 (BCPUD)			
Member	Position	Background	Years on Board
Jack Siedman	President	attorney	22
Victor Amoroso	Vice President	business owner	31
Lyndon Comstock	Member	community banker (ret)	1
Grace Godino	Member	family therapist/librarian	1
Don Smith	Member	chemical engineer (ret)	10
Average Years of Board Experience			13

⁵⁷ BCPUD also provides non-retail non-potable water for irrigation purposes and bathroom use at Mesa Park. Formal LAFCO approval would be needed for BCPUD to being providing retail non-potable water services.

5.2 Administration

BCPUD appoints an at-will General Manager to oversee all District activities. The current General Manager – Jennifer Blackman – was appointed by the Board in 2005 and is presently budgeted for 40 hours per week and generally works out of BCPUD’s Administrative Office. The General Manager presently oversees four equivalent fulltime employees including a Chief Operator and two Shift Operations dedicated to overseeing the water and wastewater systems. The General Manager is supported by an Administrative Assistant. Legal services are provided by contract with County Counsel for routine matters and supplemented by private firms as needed.

BCPUD Administrative Offices



BCPUD Administration

Table 4-4 (BCPUD)

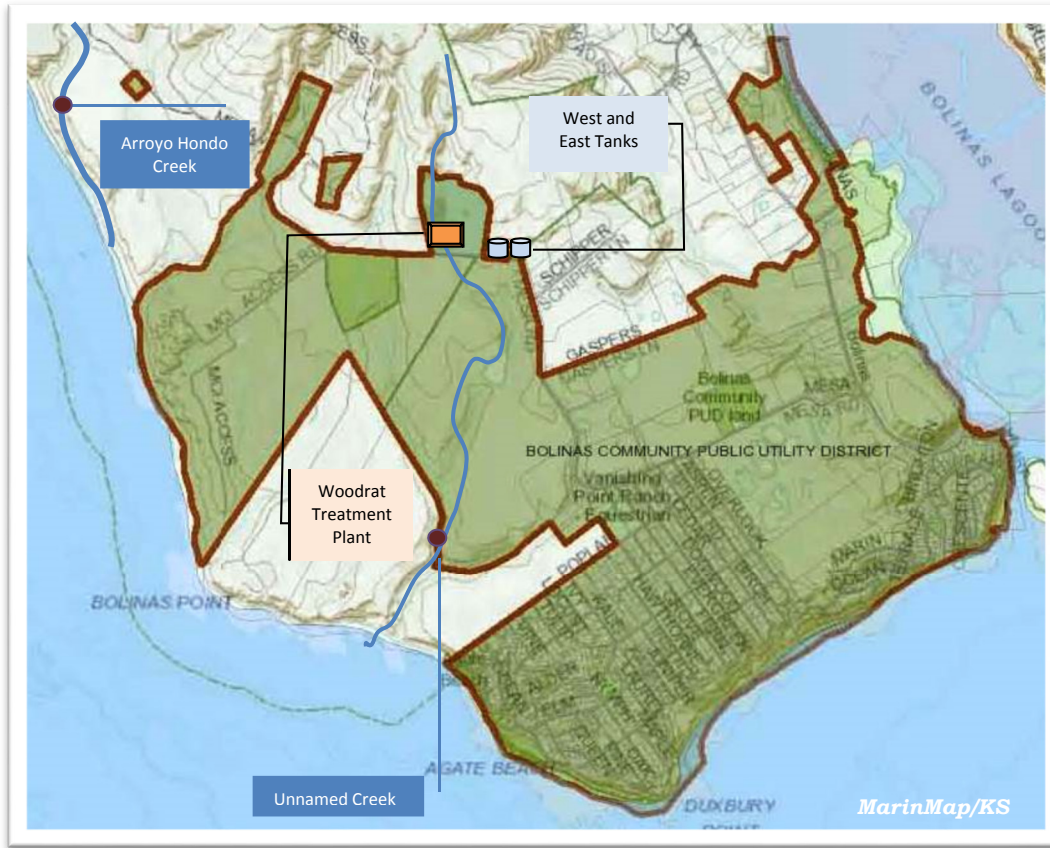
General Manager.....	Jennifer Blackman
Legal Counsel.....	County Counsel
Water System Operator.....	Bill Pierce

6.0 Potable Water Services

6.1 Service Overview

BCPUD directly provides retail domestic/potable water services through its own supply, treatment, storage, and distribution facilities. These facilities were originally constructed beginning in the 1920s by the Bolinas Beach Public Utility District (Big Mesa) and later the Bolinas Public Utility District (Little Mesa and Downtown/Harbor areas) before their approved consolidation as BCPUD in 1967. The distribution system spans approximately 19.0 miles, and on average is being replaced 1,000 linear feet or 0.2 miles per year based on work completed by BCPUD over the last 10 years. The water system itself spans close to BCPUD’s entire jurisdictional boundary and the District reports no areas experience low pressure at this time.

An overview of BCPUD’s water system in terms of key infrastructure is shown below.



6.2 Water Supplies

BCPUD’s potable water supplies are all locally sourced and drawn from surface sources lying within an approximate 2.0 square mile watershed section of the Point Reyes National Seashore. These surface sources collectively provide BCPUD with access to an estimated *maximum* available annual yield of 167 acre-feet based on applicable permit and flow capacities (emphasis). A summary of BCPUD’s primary and supplemental water source supplies follows.

BCPUD’s maximum annual potable water supply yield is estimated at 167 acre feet and is based on applicable flow, pump, and permit capacities.

Primary Source

Direct surface diversions from the Arroyo Hondo Creek - a tributary of the Pacific Ocean - serve as BCPUD’s principal potable water source. BCPUD maintains four separate post 1914 appropriated permit rights with the State Water Resources Control Board dating back as far as 1927 to draw water from Arroyo Hondo Creek at different diversion points and with four different usage

BCPUD’s potable supplies are all local surface sources with the majority drawn from the Arroyo Hondo Creek. An unnamed area stream provides emergency water supplies as needed.

allowances. These allowances, which also prescribe maximum daily and monthly amounts, permit BCPUD to collectively divert and use up to 113 acre-feet each year directly from the Arroyo Hondo Creek to its water treatment plant for immediate use. These allowances also authorize BCPUD to divert an additional 30 acre-feet annual from Arroyo Hondo Creek to storage in the District’s Woodrat Reservoir No. 2.

Secondary Source(s)

BCPUD’s remaining available potable water supplies are drawn from an unnamed area stream that also lies within the Point Reyes National Seashore. Water diverted and used from this stream is facilitated through two separate permit licenses that collectively authorize BCPUD to take up to 54.0 acre-feet annually for storage at the District’s Woodrat Reservoir No. 1 and 2 and is inclusive of any diversions to storage from the Arroyo Hondo Creek. It is the general practice of BCPUD to access water from this source for only emergencies, or when it is not possible for operational reasons for the District to divert water directly from the Arroyo Hondo Creek.⁵⁸

Supply Average

BCPUD’s average yield drawn over the study period from the District’s two potable surface sources has been 37.2 million gallons or 114.0 acre-feet.⁵⁹ The single-highest year-end use of these surface sources over the study period occurred in 2013 when BCPUD collectively drew 41.5 million gallons or 127.3 acre-feet; an amount that exceeded the average annual take during the study period by more than 10%.⁶⁰ (BCPUD notes the 2013 use was highly unusual and the result of extensive flushing needed as part of the installation of a major water main replacement project as well as several significant leaks on the distribution system; all of which the District reports were addressed by the end of 2013.)

BCPUD’s average annual water yield over the study period from Arroyo Hondo Creek and the unnamed streams has been 114.0 acre-feet.

Supply Reliability

Like other public water service providers in West Marin the reliability of BCPUD’s potable water supplies is relatively safe from external restrictions given they are entirely locally sourced. BCPUD also benefits from its surface sources lying within a protected

⁵⁸ BCPUD established a groundwater well through its joint-powers agency – Firehouse Community Park Agency) in 2009 and primarily used to irrigate with non-treated water Mesa Park and its playing fields and public restrooms. (The well is also used to providing non-treated water to an onsite green-waste composting facility and a small community farm.) The well is approximately 200 feet below surface and outfitted with a pump with the estimated (not rated) capacity to draw up to 15,000 gallons or 0.05 acre-feet per day. (BCPUD limits maximum pumping to 3,400 daily gallons.) BCPUD continues to study whether the well and surrounding groundwater basin is a viable resource to transition into a supplemental potable supply.

⁵⁹ Statement reflects BCPUD filings with the State Resources Control Board between 2013 and 2009. It is also pertinent to note BCPUD diverted only 29.6 million gallons or 90.9 acre-feet from its surface water sources in 2014, which represents a more than 20% reduction from its average annual draw.

⁶⁰ Water diversions in 2013 as reported to the State Water Resources Control Board by BCPUD totaled 107.41 from the Arroyo Hondo and 19.89 ⁶⁰

watershed that is shielded from intensive development activities and lying at elevation to allow for gravity conveyance to the District’s treatment facility; the latter of which mitigates the need for pumping. There are also no other licensed claims or permits of its two supply sources. The lone – albeit significant – restrictions to BCPUD’s water supplies involve the unknown consequence of climate change with primary concerns tied to changes in rainfall patterns and salt intrusion.

No formal analysis has been performed by BCPUD with respect to quantifying the District’s potable water supply reliability during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to BCPUD. With this in mind, the Commission projects BCPUD’s water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought.⁶¹ The substantive effect of applying this drought projection is BCPUD’s annual water supply being reduced from its normal/maximum level of 167 acre-feet to 103.5 acre-feet; a difference of (20.694) million gallons or (63.5) acre-feet.

LAFCO projects BCPUD’s water supplies will decrease up to 38% during and result in an annual supply curtailment to 103.5 acre-feet during significant droughts based on 1976-1977 conditions.

The following table summarizes BCPUD’s water supply sources relative to right/permit allowance, normal year conditions, and dry/drought year conditions.

BCPUD’s Water Supply Availability with LAFCO Projections						
Listed in Acre-Feet Table 4-5 (Marin LAFCO / BCPUD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To BCPUD	Convey Year Max To BCPUD	76-77 Drought Day Max To BCPUD	76-77 Drought Year Max To BCPUD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
Arroyo Hondo (09466)	0.38	70.00	0.38	70.00	0.24	43.40
Arroyo Hondo (11945)	0.46	30.00	0.46	30.00	0.29	18.60
Arroyo Hondo (11013)	0.18	43.00	0.18	43.00	0.11	26.66
Unnamed (11716)	0.07	24.00	0.07	26.00	0.04	16.12
Total Yield	1.09	167.00	1.09	167.00	0.68	103.5

LAFCO Calculation
To Parallel 1976-77
Drought Conditions

⁶¹ State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 76% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale BCPUDs supplies are permitted and already incorporate a baseline reduction in total flows in Arroyo Hondo Creek and the unnamed streams.

Notes to Water Supply Table:

- 1) BCPUD’s licenses for surface diversions are all post 1914 appropriative rights and subject to external oversight.
- 2) Permit No. 11013 incorporates a second permit – No. 06344 – and jointly allows BCPUD to divert up to 43 acre-feet of water from Arroyo Hondo Creek each year.
- 3) Permits No. 11945, 11944, and 11716 restrict water diversions between November 1st and April 30th. These sources are also stored in two reservoirs, Woodrat No. 1 and Woodrat No. 2. BCPUD is permitted to store a total of up to 56 acre feet of water under these licenses, and it is permitted to use up to 54 acre-feet.
- 4) No pumps are needed to convey water directly from the water sources to the WTP; therefore there is no distinction between legal and accessibility allowances under normal/max conditions.
- 5) Drought year conditions have been calculated by LAFCO and reflect a 38% reduction in water supplies compared to normal/max conditions for BCPUD’s permitted right to divert water from the Arroyo Hondo Creek and the unnamed area streams, and is based on a modified version of the Department of Water Resources’ calculation for surface supply curtailment for conditions mirroring the 1976-77 drought.

6.3 Water Treatment Facilities

BCPUD treats raw water received from both surface sources (Arroyo Hondo Creek and Unnamed Area Stream) at its Woodrat Water Treatment Plant (“Woodrat Plant”). The Woodrat Plant was constructed in 1995 and later upgraded in 2007 and provides low-pressure micro-filtering of raw water to separate organic/inorganic materials; no chemicals are used to assist in coagulation. Chlorine is added to filtered water before settling into an adjacent 0.004 million gallon clearwell tank. The daily treatment capacity at the Woodrat Plant is 160 gallons a minute and *if* run continuously results in a daily maximum total of 0.230 million gallons or 0.70 acre-feet (emphasis). This daily capacity equals 64% of the 1.09 acre-feet of permitted water accessibility BCPUD can draw from its licensed sources. It also accommodates – though at capacity – the current peak-day demand of 0.68 acre-feet.

BCPUD treats all raw water sources at the District’s Woodrat Treatment Plant. This facility was upgraded in 2007 and has a daily treatment capacity of 0.230 gallons or 0.70 acre feet

BCPUD’s Water Treatment Facilities		
Table 4-6 (BCPUD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Woodrat Treatment Plant	hypochlorite (chlorine)	230,400 gallons / 0.70 acre-feet

6.4 Water Quality

BCPUD’s most recent water quality report issued in during the study period was issued in June 2014 and covers sample testing for 2013 with a majority performed in September. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the State Water Resources Control Board (SWRCB); the former addressing public

BCPUD’s last water quality report for the study period shows exceeding levels for primary containments trihalomethanes and haloacetic acids in water samples tested in 2013.

health and the latter addressing taste and appearance. The testing identified primary contaminant violations for exceeding levels of trihalomentanes and haloacetic acids over multiple sample tests; both of which are byproducts of chlorine contact with certain organic/inorganic materials. BCPUD is working with SWRCB on an action plan to lower trihalomenthanes and haloacetic acid levels going forward; results of these efforts are not known at this time. No excessive secondary contaminants were found.⁶²

6.5 Water Distribution System and Storage Facilities

BCPUD’s distribution system consists of approximately 19.0 miles of mains and overlays two connected pressures zones that jointly cover a 300 foot range in elevation between service connections. The main pressure zone is gravity-fed from BCPUD’s two water storage tanks on Mesa Road that collectively hold 0.860 million gallons or 2.68 acre-feet of treated water and trigger production at the Woodrat Plant when levels drop below a designated level. This main pressure zone currently accounts for four-fifths of all active connections. The other pressure zone – “Downtown” – lies below Mesa and includes the remaining one-fifth of connections within Little Mesa and commercial waterfront area; the pressure in the Downtown zone is regulated and lessened through a series of pressure reducing valve stations.

BCPUD’s storage capacity within the distribution system totals 2.68 acre-feet and can accommodate up to 3.7 days of average peak-day demand totals over the study period.

BCPUD’s Treated Storage Tanks			
Table 4-7 (Marin LAFCO / BCPUD)			
Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Mesa	82%	Big Mesa	860,000 gallons/2.68 acre-feet
Downtown	18%	Little Mesa and Downtown	above
		Total:	860,000 gallons / 2.68 acre-feet

6.6 Water Service Connections

BCPUD serves 587 active potable water service connections as of the study period term, and divided between 562 residential and 25 non-residential customers; the latter of which includes 20 commercial users. BCPUD’s connection total has not changed since 1971 when the District declared a water shortage emergency and adopted a moratorium on new connections. BCPUD reports none of the current water connections lie outside its jurisdictional boundary.

Trends in BCPUD’s Potable Water Connections						
Table 4-8 (BCPUD)						
Category	2009	2010	2011	2012	2013	5-Year Change
Non Residential	25	25	25	25	25	0.0%
Residential	562	562	562	562	562	0.0%
	587	587	587	587	587	0.0%

⁶² Moderate levels of chloride and sulfate were detected in 2013, but below the maximum contaminant levels.

6.7 System Demands

BCPUD’s average annual potable water production demand over the **study period** has been 37.804 million gallons or 115.9 acre-feet. The most recent completed year showed total demand/production at 41.5 million gallons or 127.4 acre-feet (see footnote 37). This most recent amount represents an average daily water demand for the entire distribution system of 0.113 million gallons or 0.35 acre-feet; an amount that is further broken down to 194 gallons per day for every service connection. Per capita use has similarly increased with a study period average of 66 gallons. The peak-day demand – the highest one day sum for the affected year (2013) – totaled 0.217 million gallons or 0.68 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.92.

BCPUD’s average annual potable water production demand over the study period has been 116 acre-feet and translates to 176 gallons per day for every active connection. The average daily water demand per resident during this period is 66 gallons. Overall water demand production has increased on average by 2.3% annually and surpasses the corresponding percentage change in estimated population growth.

With respect to overall trends, BCPUD has experienced a total increase of 11.4% in water demand production over the study period or 2.3% annually and largely attributed to a sharp rise in usage between 2012 and 2013; demands over the preceding four-year period were largely stagnant from one year to the next. BCPUD reports the spike in usage in 2013 was largely the result of the significant amount of water needed for flushing during a major pipeline improvement project. Usage between 2009 and 2012 is consistent with this latter statement and identifies demands were relatively flat with three of the four years coming in at approximately 37 million gallons or 114 acre-feet. Peak-day demands, though, increased on a more consistent and phased basis and suggests there is some level of increasingly use intensification is occurring and highlighted by single-day usage rising by nearly one-third over the five year period. The overall peak day factor during this period is 2.0, and increases to 2.39 when excluding water production from 2013. The following table summarizes overall system demands over the study period.

Study Period Trends in BCPUD’s Water Demand Production							
Table 4-9 (Marin LAFCO / BCPUD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	114.4	108.8	114.2	114.2	127.4	115.8	11.4%
Average Day	0.31	0.30	0.31	0.31	0.35	0.36	12.9%
Connections	587	587	587	587	587	584	0.0%
Per Day Connection	174g	165g	174g	174g	194g	176 gallons	11.5%
Per Day Resident	65g	62g	65g	65g	72g	66 gallons	10.8%
Peak Day	0.52	0.73	0.88	0.81	0.68	0.72	31.8%
Peaking Factor	1.67p	2.43p	2.84p	2.61p	1.94p	2.0 peaking	16.2%

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Projecting forward it appears reasonable to assume BCPUD’s water demands will revert back to pre 2013 levels in the short term and remain relatively stagnant going forward through 2023. Specifically, and for purposes of this review, it is assumed BCPUD’s annual water demand will hold at 37.1 million gallons or 114.2 acre-feet with an annual peak-day factor of 2.39. These assumptions appear justified given the existing moratorium on new water service connections will presumably continue through 2023 and – although not necessarily exclusively – curb any new population growth. The following table summarizes Commission projected demands over the next 10 years.

LAFCO Projected Trends in BCPUD’s Water Demands							
Table 4-10 (Marin LAFCO)							
Category	Baseline	2015	2017	2019	2021	2023	10-Year Change
Annual Total	127.4	114.2	114.2	114.2	114.2	114.2	(10.4%)
Average Day	0.36	0.31	0.31	0.31	0.31	0.31	(13.9%)
Peak Day	0.68	0.75	0.75	0.75	0.75	0.75	10.3%
Connections	587	587	587	587	587	587	0.0%
Per Day Connection	194g	193g	193g	193g	193g	193g	(0.5%)
Residents	1,574	1,574	1,574	1,574	1,574	1,574	0.0%
Per Day Resident	72g	65g	65g	65g	65g	65g	(9.7%)

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Notes to LAFCO Projected Trends in Water Demands:

- 1) Peak day demands assume a flat 2.39 ratio over average day demands based on 2009 to 2012 data.

6.8 Infrastructure Capacities to Demands

BCPUD’s water infrastructure is currently operating with available capacity in supply, storage, and treatment relative to existing demands during normal and non-peak conditions. The water system, however and pertinently, requires improvements and/or adjustments in usage to address present and projected capacity deficiencies in supply and treatment during drought periods and high-day usage periods. This specifically includes the need to either expand supplies and/or reduce per capita usage to meet existing and future demands when water sources are curtailed due to low rainfall runoff charging BCPUD’s surface supplies. Similar needs are also present with respect to having sufficient treatment capacity to meet peak-day demands to help protect against outages and low pressure. BCPUD also requires improvements to the District’s treatment process to mitigate and reduce the byproduct containments tied to chlorine disinfection; a process currently underway by District management.

The following statements summarize and quantify existing and projected relationships between BCPUD’s capacities and demands now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Water Supply:

Annual Ratios

- Average annual water production demands generated over the study period represent 69% of BCPUD’s projected accessible sources under normal conditions. No substantive change in this ratio is expected through 2023
- Average annual water production demands generated over the study period represent 112% of BCPUD’s projected accessible sources under projected single dry-year conditions – or a (12%) deficit. This ratio is expected hold to 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 66% of the new daily supply available to BCPUD under normal conditions. This ratio is expected to rise to 69% by 2023.
- Average peak-day water production demands over the study period represent 106% of the new daily supply available to BCPUD under projected single dry-year conditions – or a (6%) deficit. This ratio is expected to rise to a deficit of (10%) by 2023.

Water Treatment:

- BCPUD’s treatment supplies are at capacity in meeting average peak-day demands over the study period with high-day usage equaling 103% of available processing or a (3%) deficit. This demand-to-treatment ratio is expected to increase and generate a peak-day deficit of (7%) by 2023.

Water Storage:

- Overall potable storage supplies adequately meet BCPUD’s average peak-day demands over the study period with the latter (demands) equaling 27% of the former (storage supplies). This demand-to-storage surplus is expected to hold without much significant change going forward to 2023.
- Both pressure zones within BCPUD’s distribution system have adequate dedicated potable storage in meeting their proportional share of the District’s peak day demand average over the study period. No substantive change in these storage ratios is projected going forward to 2023.
- BCPUD’s potable storage capacity would allow the District to accommodate up to 3.7 consecutive days of average peak-day demands during the study period without recharge. This capacity is projected to decrease to 3.6 days going forward to 2023.

Water Conservation / Mitigation:

- BCPUD declared a water shortage emergency in November 1971 and placed a prohibition on issuing new water connections. The Board has periodically reviewed and affirmed this declaration and there is no expectation of BCPUD lifting the moratorium on new water connections in the near future.

A summary table assessing supply, storage, and treatment capacities relative to current and projected demands within BCPUD to 2023 is provided below.

BCPUD’s Capacity Relative to <u>Current</u> Average System Demands			
Table 4-11 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply ..normal conditions	✓		
..single dry-year conditions			✓
Water Treatment			✓
Water Storage	✓		

BCPUD’s Capacity Relative to <u>Projected</u> System Demands by 2023			
Table 4-12 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply ..normal conditions	✓		
..single dry-year conditions			✓
Water Treatment			✓
Water Storage	✓		

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

BCPUD relies on two separate charges to fund the District’s potable water system in terms of operating and improvements: (a) user and (b) availability charges. Both charges are set by Board resolution. The user charge was last updated in 2009 and is in tier format to apply an escalating rate based on consumption with current average meter uses producing a quarterly bill of \$30.⁶³ The availability fee was last updated in 2011 and is an annual flat rate service charge of \$1,018 and collected on the property tax bill. There are no voter

The current average residential customer in BCPUD is paying \$1,138 annually in direct water charges based on a daily use of 174 gallons. This produces an approximate ratio of \$1.79 for every 100 gallons.

⁶³ Average quarterly usage charge based on 174 gallons per day or 15,876 gallons per quarter and reflects the average day usage in 2011 and 2012.

approved special assessments tied to the operation and improvement of BCPUD’s water system. The cumulative cost for most BCPUD customers is \$1,138 annually and results in a per 100 gallon equivalent charge of \$1.79 based on rates as of January 2015 and average uses during the study period.

BPUCD also does not have an adopted connection fee to establish water service due to the standing moratorium.

7.0 Agency Finances

7.1 Financial Statements

BCPUD contracts with an outside accounting firm (Doran & Associates) to prepare an annual report for each fiscal year to review the District’s financial statements in accordance with established governmental accounting standards. This includes, most notably, vetting BCPUD’s statements with respect to verifying overall assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing BCPUD’s short and long-term fiscal health.

BCPUD’s most recent financial statements for the study period were issued for 2012-2013 and shows the District experienced a modest and positive change over the prior fiscal year as its overall equity or fund balance increased by 2.9% from \$5.075 to \$5.223 million. This includes appears primarily attributed to investments in capital infrastructure, including replacing fire hydrants off of the distribution system. A summary of year-end totals and corresponding trends over the last five years follows.

2012-2013 Financial Statements	
Assets	\$6.787 m
Liabilities	\$1.564 m
Equity	\$5.223 m

Agency Assets

BCPUD’s audited assets at the end of 2012-2013 totaled \$6.787 million and have increased during the last five years by nearly one-fourth. Assets classified as current with the expectation they could be liquidated within a year represented nearly one-third of the total amount with the majority tied to cash and investments and have nearly doubled over the last five reported years. Assets classified as non-current represented the remaining two-thirds with the largest portion associated with buildings and utility infrastructure.

BCPUD Assets Study Period						
Table 4-13 (BCPUD)						
BCPUD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Assets	1.067	2.249	2.082	2.019	2.103	97.2%
Non-Current Assets	4.417	4.359	4.448	4.358	4.683	6.0%
	\$5.484	\$6.608	\$6.531	\$6.377	\$6.787	23.8%

amounts in millions

Agency Liabilities

BCPUD’s audited liabilities at the end of 2012-2013 totaled \$1.564 million and have decreased by nearly one-fifth – (18.8%) – over the last five reported years. Current liabilities representing obligations owed in the near-term account for close to one-third of the total and generally tied to accounts payable and debt payments. Non-current liabilities represented the remaining two-thirds and tied to two outstanding loan obligations totaling \$0.519 million for recent installation of solar panels on BCPUD’s treatment plant facilities along with remaining bond payments for water and sewer upgrades from the late 1970s.

BCPUD Liabilities Study Period						
Table 4-14 (BCPUD)						
BCPUD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Liabilities	0.258	0.254	0.279	0.219	0.599	132.2%
Non-Current Liabilities	1.667	1.491	1.204	1.081	0.965	(42.1%)
	\$1.926	\$1.746	\$1.484	\$1.301	\$1.564	(18.8%)

amounts in millions

Agency Equity / Net Assets

BCPUD’s audited equity / net assets at the end of 2012-2013 totaled \$5.223 million and represent the difference between the District’s total assets and total liabilities. This amount has increased by nearly one-half over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with the aforementioned reduction in liabilities and resulting increase in capital assets. The end of year equity amount includes a \$1.633 million in unrestricted funds.

BCPUD’s unrestricted fund balance total of \$1.633 million equates to a per capita amount of \$1,037 as of the study period term.

BCPUD Equity Study Period						
Table 4-15 (BCPUD)						
BCPUD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Unrestricted	0.946	2.158	2.102	2.104	1.633	72.5%
Restricted	.002	0.009	0.010	0.025	0.025	1002.4%
Capital	2.609	2.694	2.934	2.945	3.564	36.6%
	\$3.558	\$4.862	\$5.047	\$5.075	\$5.223	46.8%

amounts in millions

7.2 Liquidity, Capital, and Margin

A review of the last five audited financial statement issuances by BCPUD covering the study period and fiscal years 2008-2009 through 2012-2013 shows the District generally finished each year in strong financial position and highlighted by positive operating margins in four of the five year. BCPUD has also improved its capital standing over the five year period by reducing its long term indebtedness by over one-half and ending with a relatively low debt-to-net asset ratio of 18%. BCPUD’s liquidity levels, in contrast, did decrease by 15% over the five year period as a result of escalating short-term debt obligations, but the District still finished 2012-2013 with current assets outpacing current liabilities by 3 to 1. A summary of year-end liquidity, capital, and operating margin ratios are show in the following table.

BCPUD Liquidity, Capital, and Margin Study Period			
Table 4-16 (Marin LAFCO / BCPUD)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	4.1 to 1	47%	60.0%
2009-2010	8.8 to 1	31%	(5.29%)
2010-2011	7.4 to 1	24%	15.3%
2011-2012	9.1 to 1	21%	4.0%
2012-2013	3.5 to 1	18%	12.2%
Average	6.6 to 1	28%	17.2%
5-Year Trend	(15.0%)	(60.1%)	(79.6%)

7.3 Pension Obligations

BCPUD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. BCPUD maintains two contract packages – termed “Tier One” and “Tier Two” – for employee pensions based on the date of hire. Tier One is based on a 2.0% at 60 formula and would provide an eligible retiree with 20 years of total service credit 40% of their highest year salary beginning at age 60 and continuing each year thereafter until death. Tier Two is based on a 2.0% at 62 formula and would also provide an eligible retiree with 20 years of total service credit 40% of their highest three years of salary beginning though not until age 62.

BCPUD’s Defined Pension Benefit Packages	
Table 4-17 (Marin LAFCO / CalPERS)	
Category	Miscellaneous
Tier One (Pre January 2013).....	2.0% at 60
Tier Two (Post January 2013).....	2.0% at 62

Note:

All tiers provide up to a 2.0% annual cost-of-living adjustment

Funding contributions for BCPUD are based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arrangements between the District and its employees. A listing of recent and planned contribution rates for BCPUD as determined by CalPERS along with enrollee information follows.

BCPUD's Contribution Rates to CalPERS					
Table 4-18 (Marin LAFCO / CalPERS)					
11-12	12-13	13-14	14-15	15-16	5-Yr Change
10.90%	11.03%	11.18%	11.26%	11.90%	9.2%

Projected

BCPUD's Pension Enrollee Information	
Table 4-19 (Marin LAFCO / CalPERS)	
Enrollee Type	As of June 30, 2013
Active.....	6
Transferred.....	0
Separated.....	2
Retired.....	8

BCPUD's total annual pension contributions are on the rise in step with increasing liability based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. Overall BCPUD has increased its total annual pension contributions by 13.5% from \$0.037 million to \$0.042 million over the last three reported years; a change that exceeds the corresponding inflation factor for the San Francisco Bay area region during this period of 5.0% by over twofold. The increase in contributions has helped to improve BCPUD's funded ratio – the market difference between the pension plan's assets and liabilities – by 2.1% and ended the period at 81.4%. However, BCPUD's unfunded liability – pension monies owed that are not covered by assets – also increased by 7.2% from \$0.373 million to \$0.400 million; an amount that equals 24.1% of the District's undesignated fund balance as of the start of 2013-2014.⁶⁴ BCPUD's worker-to-retiree ratio finished the period at 0.75 despite an improvement of over one-third; all of which means it is reasonable to assume employer and employee contributions will need to increase to simply maintain existing debt levels.

BCPUD's unfunded pension liability has increased over the last three reported years by 2.1% and currently totals \$0.400 million; an amount that equals 24% of the District's undesignated fund balance as of the start of 2013-2014.

⁶⁴ BCPUD's undesignated fund balance (audited) as of June 30, 2013 totaled \$1.663 million.

BCPUD Trends in Pension Measurements

Table 4-20 (Marin LAFCO / CalPERS)

Category	2010-2011	2011-2012	2012-2013	Difference
BCPUD Annual Contribution	\$0.037 million	\$0.040 million	\$0.042 million	13.5%
Funded Ratio – Market	79.7%	76.5%	81.4%	2.1%
Unfunded Liability - Market	\$0.373 million	\$0.465 million	\$0.400 million	7.2%
Funded Ratio – Actuarial	89.1%	91.0%	n/a	-
Unfunded Liability -Actuarial	\$0.201 million	\$0.179 million	n/a	-
Active to Retiree Ratio - active employees for every retiree	0.54	0.75	0.75	38.9

Notes:

- 1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now).
- 2) Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.) CalPERS no longer calculates AVA measurements as of the 2012-2013 fiscal year.

7.4 Revenue and Expense Trends

BCPUD has maintained positive revenue to expense differences in four of the five fiscal years covering the study period and through 2008-2009 to 2012-2013 with a year-end average net of \$0.314 million. Average year-end revenues over this period have totaled \$1.592 million with over one-half drawn from utility charges (54.7%) and one-fifth from property taxes and assessments (20.2%). Average year-end expenses over the same period have totaled \$1.278 million with personnel expenses – salary and benefits – accounting for slightly more than one-half (50.5%). Notably, BCPUD’s operational relationship has improved with revenue gains at the end of the five year period exceeding expense gains by 14 to 1 and led by a 22% rise in utility charges. A summary of actual averages in both revenue and expense ledgers follows.

BCPUD has maintained positive year-end operating balances in four of the five years covering the study period with an average net of 24.6% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than triple.

Actual Trends in BCPUD Revenues | Study Period

Table 4-21 (Marin LAFCO / BCPUD)

Category	Five Year Average (2008-09 to 2012-13)	Five Year Average Portion of Total	Five Year Trend (2008-09 to 2012-13)
Property Taxes/Assessments	303,180	20.2	4.0%
Water/Sewer Charges	806,031	54.7	22.4%
Resource Recovery *	89,020	6.0	28.6%
Interest/Investments	11,907	0.8	(88.6%)
Other	382,951	18.3	2.0%
Trends	\$1,592,951	100%	14.3%

* Involves BCPUD’s green waste disposal program and includes composting sales.

Actual Trends in BCPUD Expenses | Study Period

Table 4-22 (Marin LAFCO / BCPUD)

Category	Five Year Average (2008-09 to 2012-13)	Portion of Total	Five Year Trend (2008-09 to 2012-13)
Salaries	451,108	35.6	22.8%
Benefits	190,496	14.9	27.2%
Insurance	23,645	1.9	4.1%
Plant Expenses	155,519	12.1	(33.5)%
Power/Fuel	25,916	2.0	(57.8)%
Office	35,530	2.8	15.2%
Professional Services	37,767	3.0	(12.9)%
Other / Depreciation	358,715	28.0	(14.4)%
Trends	\$1,278,700	100%	0.7%

B. INVERNESS PUBLIC UTILITY DISTRICT

1.0 Overview

The Inverness Public Utility District (IPUD) was formed in 1948 and encompasses an approximate 2.2 square mile jurisdictional boundary along the western shore of Tomales Bay. Governance is provided by a five-person board whose members are directly elected by registered voters and who serve staggered four year terms. Access to IPUD’s jurisdictional boundary is primarily limited to Sir Francis Drake Boulevard. The community is approximately 31 miles from the nearest incorporated community, Fairfax, and lies within the Shoreline Unified School District with students assigned absent of transfer to Tomales High.



IPUD is organized as a limited-purpose agency and provides two distinct services: (a) potable water and (b) fire protection. Existing development within IPUD is divided between three planning areas or subdivisions termed in order of their establishment as “Old Inverness,” “Seahaven,” and “Pinehill.” The remainder of IPUD – approximately 13% – is on the western perimeter of the District and lies in the Tomales Bay State Park. All potable water supplies established by IPUD are locally drawn from surface and groundwater sources with the primary supplies tied to First, Second, and Third Creeks. The average annual water demand for IPUD over the study period has been 23.2 million gallons or 71.2 acre-feet and represents a daily capita use of 45 gallons.⁶⁵

IPUD’s service area – collectively referenced in this review as “North Inverness” – represents the northern half of Inverness; one of 20 formally defined unincorporated communities in Marin County. The estimated resident total within IPUD counting both fulltime (583) and part-time (792) is estimated by the Commission at 1,375 as of the term of this study period.⁶⁶ This total amount represents an increase of 0.7% over the

Inverness PUD

Formation Date	1948
Enabling Legislation	Public Utilities Code Section 15501 et. seq.
Service Categories	Potable Water Fire Protection
Population	1,375
Registered Voters	506
Current Buildout Population Estimate	1,582

study period and is slightly above the countywide growth rate of 0.6% over the same period. The projected buildout population as calculated by the Commission and based on current planning policies of the land use authority (County of Marin) within IPUD is

⁶⁵ The average daily water demand per resident is drawn from total water production between 2009 and 2013 and calculated using the Commission’s own resident population projections for IPUD.

⁶⁶ The resident population estimate is specific to IPUD’s water service area; the population within the District’s fire service area is likely to be slightly larger. The projected fulltime/part-time resident ratio of 42% to 58% has been calculated by the Commission for informational purposes only and does not incorporate the potential for non-owner fulltime residents in IPUD. The actual calculation is detailed in Section No. 4.1.

estimated at 1,582.⁶⁷ Registered voters total 506 and represents 37% of the estimated population. The operating budget at the term of the study period was \$0.815 million with funding for the equivalent of 4.0 employees. The unrestricted fund balance was \$0.241 million and sufficient to cover three months of general expenses based on adopted expenditures in 2013-2014.⁶⁸

2.0 Background

2.1 Community Development

North Inverness' present-day service area began its initial development in the 1880s following decades of ownership changes dating back to 1836 when the area was conveyed as part of an approximate 35,000-acre land grant – Ranchos Punta de los Reyes – from Mexico to James Berry.⁶⁹ Ownership eventually fell to former State Assemblyman James Shafter and his brother Oscar and they began marketing the then dairy ranch lands as an upscale planned community with the expectation of anchoring development to a future resort to reportedly rival the Del Monte Hotel in Monterey. These efforts promulgated the area's first formal subdivision (to be known as "Old Inverness") in 1889 consisting of residential and commercial uses along present-day Sir Francis Drake Boulevard. The name "Inverness" itself appears to have been given by Scotsman Captain Alexander Bail, the first fulltime European resident believed to have settled in the area.



⁶⁷ The buildout projection for IPUD has been calculated by the Commission with assistance from IPUD staff and based on the potential development of 55 new lots within the District that after subdivision could produce up to 74 total residential units and multiplied by a resident factor of 2.8 per unit to generate 207 new residents.

⁶⁸ IPUD also maintains a restricted fund balance for emergencies totaling \$0.750 million.

⁶⁹ Background information is principally drawn from prior LAFCO reports and substantively supplemented from Imagine of America's *Point Reyes Peninsula* (Carola DeRooy and Dewey Livingston).

Initial development of North Inverness continued slowly into the early 1900s with most of the original lots being constructed on Edgemont and Hawthornden Ways. Records show approximately 40 residential lots – albeit mostly seasonal – were built in Old Inverness by 1906 with several needing to be rebuilt following that year’s earthquake involving the nearby San Andreas fault line. Construction of seasonal residences in Old Inverness proved particularly popular with faculty members of the University of California and marked by a Berkeley-led contingency establishing the Inverness Yacht Club in 1912; a members-only boating club that continues to operate today. Development gradually expanded out of Old Inverness by the 1930s in step with additional land holdings of the Shafter family being sold and subdivided to accommodate increasing interest for housing in West Marin. This outward expansion also marked a gradual transition in land use trends in which more permanent residences were being built beginning with the north-end Seahaven Subdivision in the 1940s and later the central Pinehill Subdivision in the 1960s.

2.2 Formation Proceedings

The formation of IPUD was completed in 1948 with the County of Marin’s Boundary Change Commission approving the official service area of the District followed by a successful vote of residents. The underlying priority in forming IPUD was to facilitate the purchase of the private water company (Inverness Water Works) and assume its service responsibilities thereafter. Three subsequent votes to fund the purchase of the private water system, however, failed between 1949 and 1950 for various reasons. As such, and as detailed in the succeeding section, IPUD remained largely dormant following its formation and until 1951. Other services authorized under the principal act – and specifically fire protection and parks/recreation – were not activated at the time of formation.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by IPUD and/or affecting the District’s service area following formation in 1948 is provided below.

- 1950s • IPUD activated its fire protection services through a vote of the District Board in 1951 and assumed all service responsibilities therein of the County supported Inverness Volunteer Fire Department.
- The Tomales State Park was established in 1952 at the urging of locals to create an open-space preserve covering several popular recreational sites around Tomales Bay – including Shell Beach and Millerton Point. The establishment of the Tomales State Park ultimately involved the State purchasing close to 1,000 acres and eventually included close to 13% of IPUD’s jurisdiction as well as lands immediately to the north of the District.

- 1950s • The two private water systems previously established to serve the Old Inverness (1890s) and Seahaven (1930s) Subdivisions eventually fell under common ownership in 1959.
- 1970s • The County adopted the Inverness Ridge Communities Plan in March 1979 and covers North Inverness and extends as far south as Inverness Park. The Communities Plan was updated in 1983 and serves as the key visioning document in prescribing desired land use and related management policies. This includes allowing for “reasonable” opportunities for further residential development as well as commercial uses within existing retail corridors with minimum lot requirements for North Inverness ranging between one and three acres for development purposes. It also legalized existing second units – which had become pervasive – and recognized the regional importance of allowing cottage services (i.e., bed and breakfast inns) to continue.
- IPUD received voter approval in June 1979 to authorize the issuance of up to \$7.5 million in bonds for the acquisition, startup, and rehabilitation of the two privately-owned water systems in the area. This approval coincided with the Board activating its latent power to provide domestic water service. (This action predates legislation requiring latent powers to be approved by LAFCO.)
- 1980s • IPUD’s water system experienced significant damage as a result of landslides tied to the January 3-5, 1982 storms affecting the entire San Francisco Bay Area region. Road access to North Inverness was also blocked for several days thereafter and resulted in extensive damage to private property.
- IPUD considered a purchase agreement for supplemental water supplies from the North Marin Water District – service provider for Inverness Park – in early 1988. However, and as an immediate response, concerned constituents circulated a petition forbidding IPUD to negotiate an agreement without prior voter approval. The resulting vote to authorize IPUD to negotiate an agreement with North Marin for additional water supplies was defeated by more than a 2-1 ratio in November 1988.
- 1990s • IPUD remodeled the District’s original firehouse in 1994 to expand and provide formal offices for administration services through the addition of a second floor along with needed storage space.
- The Vision Fire in October 1995 burned approximately 12,000 acres in the Paradise Estates Subdivision of Inverness Park and in the Point Reyes National Seashore, and encroached from the southwest into IPUD’s watershed. None of the 45 homes destroyed were located in the District.

2.4 Previous Municipal Service Review

The Commission’s inaugural municipal service review on IPUD was completed in June 2007 as part of an agency-specific study. This initial municipal service review provided a baseline evaluation of IPUD and its water and fire protection services and concluded the District’s water system was operating at capacity and additional supplies would be needed to accommodate any significant new uses; the latter of which LAFCO reported IPUD was disinterested in pursuing given the community’s desire to rely solely on local resources to meet development demands. No governmental reorganization options were identified for additional review.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

IPUD’s existing jurisdictional boundary is approximately 2.2 square miles in size and covers 1,410 unincorporated acres with over one-tenth (196 acres) owned by the State and included in the Tomales Bay State Park. There are overall 755 legal parcels within IPUD based on County Assessor’s Office records. Ownership of these parcels is divided between 92.8% private and 7.2% public/non-profit titleholders with the latter category accounting for over one-third of all jurisdictional acres. Total assessed value (land and structures) within IPUD is set at \$244.8 million as of January 2015.

IPUD’s jurisdictional boundary spans 2.2 square miles with a current total assessed value of \$244.8 million; the latter of which represents an estimated per capita assessed value of \$0.178 million.

The portion of IPUD’s jurisdictional boundary under private ownership is nearly built-out with 532 of the 701 – or 75.9% – affected parcels already developed. Remaining development potential in IPUD appears limited to the eventual building of 55 vacant parcels that meet the minimum development size under existing County zoning standards and appear relatively unencumbered by topography and other constraints.⁷⁰

IPUD’s Jurisdictional Boundary Characteristics

Table 4-23 (Marin LAFCO / MarinMap)

Total Jurisdictional Acreage.....	1,410
Total Jurisdictional Parcels.....	755
- Number of Parcels Under Private Ownership / Total Acres.....	708 / 858.6
- Number of Parcels Under Public – Non Profit Ownership / Total Acres.....	54 / 481.4
- Total Number of Public Right-of-Way Acreage.....	70.0
- Percentage of Parcels Under Private Ownership Developed.....	75.9
- Percentage of Parcels Under Private Ownership Undeveloped.....	24.1
Total Number of Registered Voters.....	506
Total Assessed Value.....	\$244.841 m

⁷⁰ In consultation with IPUD, the development of these 55 vacant lots within the District is likely to generate up to 74 residential units.

Notes to Boundary Characteristics Table:

- 1) There are 47 parcels within IPUD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

IPUD’s jurisdictional boundary has remained entirely unchanged with no recorded boundary changes since LAFCOs were created in 1963.

3.3 Sphere of Influence

IPUD’s sphere of influence was established by the Commission in November 1984. The established sphere was purposely set to match IPUD’s entire 1,410 acre jurisdictional boundary with no additional lands.⁷¹ No specific policy statements regarding future governance or boundary change issues for IPUD were included in the adopted resolution. The Commission updated the sphere in June 2007 consistent with CKH and its regular review requirement with no immediate changes. The update noted, though and pertinently, there are overlapping spheres and boundaries of IPUD and the North Marin Water District as a result of the latter annexing IPUD’s jurisdictional boundary in 1967 in anticipation of purchasing the private water systems in the area. These planned purchases were made by IPUD, but was not followed by detachment proceedings or an adjustment to North Marin Water District’s sphere. As a result, the update in 2007 directed the Commission to revisit and address as appropriate these overlaps as part of this study.

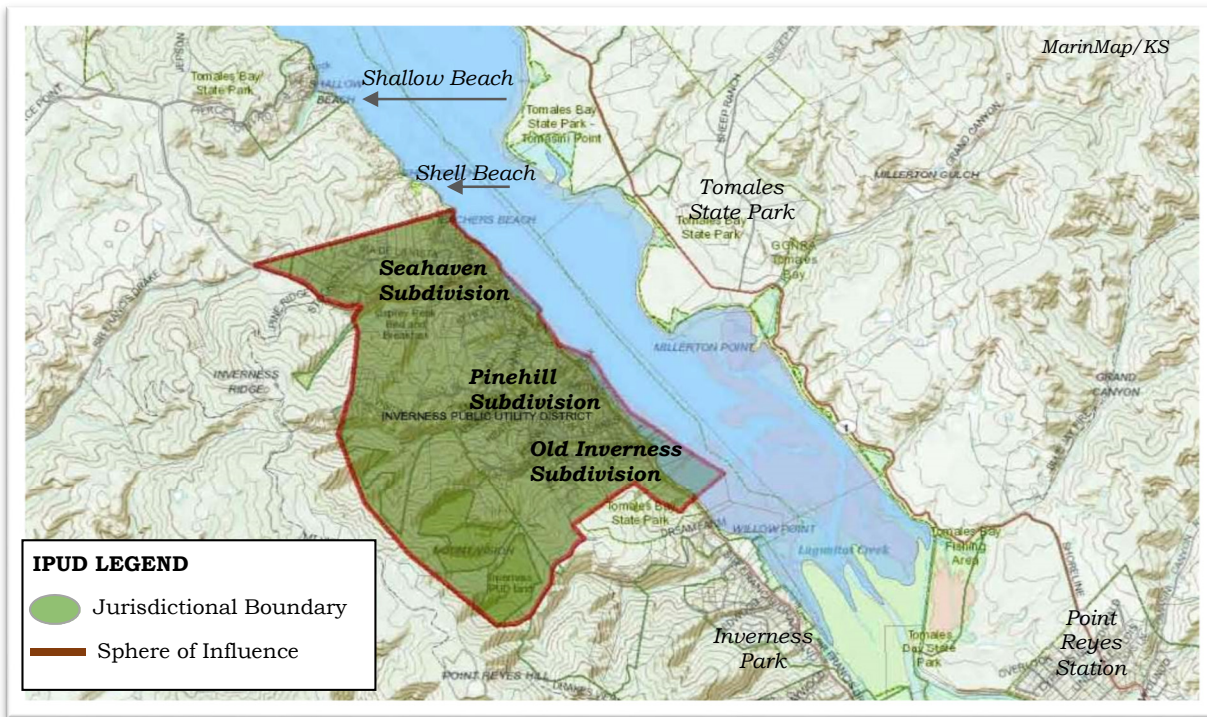
IPUD’s sphere is coterminous with its jurisdictional boundary; i.e., this baseline suggests no expansion of the jurisdictional boundary is expected as of the last update in 2007.

3.4 Outside Services

IPUD reports it does not provide any regular services – and specifically water – outside its existing jurisdictional boundary.

⁷¹ The established sphere of influence was unanimously approved by the Commission.

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

IPUD’s total resident population (fulltime and part-time) within its jurisdictional boundary’s service area is estimated by the Commission at 1,375 as of the term of the study period.⁷² This projection also indicates IPUD is at 86.9% with respect to its estimated resident buildout total of 1,582.⁷³ The current resident estimate, which is based on a modified calculation provided under State law specific to public water systems, represents a projected total population growth rate of 0.7% over the study period or 0.12% annually and tied to County records showing the construction/connection of three new single-family residences within IPUD since 2008. This projected growth rate is slightly above the annual

LAFCO estimates there are 1,375 total residents within IPUD that are explicitly served by the District’s potable water system as of the term of this study. This means IPUD is at 86.9% of its resident buildout, and not expected to reach buildout until 2130.

⁷² California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid combining the second and third options is appropriate for purposes of this review and involves multiplying the number of IPUD residential service connections – 491- by 2.8 to produce 1,375.

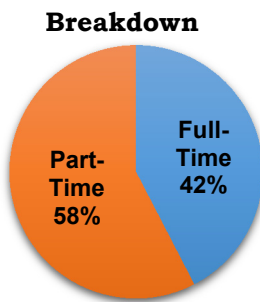
⁷³ The current buildout projection for IPUD of 1,582 is drawn from identifying the number of new units – 55 – that could be accommodated within the District based existing County of Marin land use policies coupled with topography and service limitations identified by District staff – 55 – and multiplied by a factor of 2.8. Actual construction is subject to external factors and highlighted by market demands and permit approvals from the County.

rate for the entire county over the same five year stretch – 0.6% - with the current population total in the District representing 0.5% of the countywide total.⁷⁴

With respect to forwarding projections, and for purposes of this review, it is reasonable to assume the annual growth rate in IPUD will match the study period with an overall yearly change of 0.12%. The substantive result of this assumption would be an overall increase in IPUD’s resident population of 17 to total 1,391 by 2023. It also indicates – and if this growth rate were to hold thereafter – IPUD will reach its estimated resident buildout of 1,582 until the year 2,130. These collective projections – past, current, and future – are summarized below.

LAFCO Population Estimates for IPUD				
Table 4-24 (Marin LAFCO)				
2008	2013	2018	2023	Annual Trend
1,366	1,375	1,383	1,392	0.12%

4.2 Residency Type



The Commission projects for the purposes of this review that IPUD’s estimated residential total of 1,375 is divided between 583 fulltime and 792 part-time residences as of the term of the study period.⁷⁵ This projection – which is premised on the assumption of limited rental properties in IPUD – is based on a review of current Assessor records and indicates less than one-half of the District’s population is present during normal weekdays and increases by over 100% during peak weekend and summer periods.

4.3 Social and Economic Indicators

A review of demographic information covering the study period for the Inverness community indicates IPUD’s fulltime residents are relatively older – and getting older – compared to countywide averages.⁷⁶ This information is based on census data covering the 2005 to 2012 period and shows IPUD’s residents have experienced a notable decline in their economic standing with close to a one-fourth decrease in the median household income along poverty rates more than doubling from

IPUD’s fulltime constituents are and increasingly economically disadvantaged compared to county averages based on median household income and poverty rate discrepancies.

⁷⁴ Countywide total population is estimated at 254,007 as of February 2014.

⁷⁵ LAFCO calculated this estimate based on mailing address information for all IPUD landowners and the associated 580 assigned living units within the District from the County of Marin Assessor’s Office. The resulting percentages – 42.4% of units with local landowner mailing addresses versus 57.6% of units with non-local landowner mailing addresses – were then applied to the separately calculated resident service population amount of 1,375 to show 583 fulltime and 792 part-time residents.

⁷⁶ The census data used by LAFCO applies to the entire Inverness community and includes IPUD’s service area (Northern Inverness) as well as Inverness Park and Paradise Estates (Southern Inverness).

6.6% to 15.1%; the latter amount also equaling more than double the countywide poverty rate. The following table summarizes trends in selected social and economic indicators specific to residents within IPUD’s jurisdictional boundary.

IPUD Resident Trends in Social and Economic Indicators				
Table 4-25 (Marin LAFCO / American Community Surveys)				
Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Avg.
Median Household Income	\$62,071	\$52,135	(16.0%)	\$90,962
Median Age	55.3	60.0	8.5%	44.6
Prime Working Age (25-64)	58.0%	58.1%	0.1%	56.6%
Unemployment Rate (Labor Force)	0.0	2.0%	--%	4.5%
Persons Living Below Poverty Rate	6.6%	15.1%	128%	7.5%
Mean Travel to Work	30.8 minutes	29.9 minutes	(2.9%)	28.4 minutes
Adults with Bachelor Degrees or Higher	55.0%	53.2%	(3.3%)	54.6%
Male	36.5%	45.3%	24.1%	49.2%
Female	63.5%	57.7%	(14.1%)	50.8%
White / Non-Hispanic	95.6%	88.6%	(7.3%)	73.1%
Hispanic	4.4%	8.0%	81.8%	15.3%
Other	0.0%	3.4%	--%	11.6%

5.0 Organizational Structure

5.1 Governance

IPUD’s governance authority is codified under the Public Utilities Act of 1913 (“principal act”) and empowers the District to provide a moderate range of municipal services upon approval by LAFCO. IPUD – which is currently one of 54 public utility districts operating currently in California – is presently authorized to provide two specific services within its jurisdictional boundary: (a) potable water and (b) fire protection. All other latent powers enumerated under the principal act would need to be activated by the Commission before IPUD would be allowed to initiate. A list comparing active and latent power authorities under the principal act for IPUD follows.

LAFCO approval is needed for IPUD to activate a latent power or divest itself from an existing service.

Active Service Powers

- potable water
- fire protection

Latent Service Powers

- drainage
- transportation
- power (light and heat)
- wastewater services
- telephone/communication
- street lighting
- solid waste/garbage
- parks/recreation

IPUD has been governed since its formation in 1948 as an independent special district with registered voters within the District serving on the Board. The Board initially consisted of three members and later expanded to five in the mid-1970s. Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating president system and currently choose to receive no per diems. The Board currently meets on the fourth Wednesday at 9:00 A.M. of each month at the IPUD’s Administrative Office located at 50 Inverness Way.

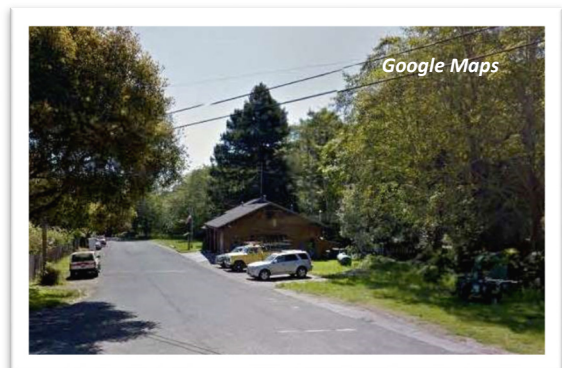
A listing of Board members as of January 2015 along with respective backgrounds and continuous years of current service follows.

IPUD Board Roster			
Table 4-26 (IPUD)			
Member	Position	Background	Years on Board
Kenneth Emanuels	President	public agency analyst	9
Dakota Whitney	Vice President	attorney	1
Laura Alderdice	Member	music teacher	10
Brent Johnson	Member	civil engineer	1
James Laws	Member	medical doctor	1
Average Years of Board Experience			4.4

5.2 Administration

IPUD appoints an at-will General Manager to oversee all District activities. The current General Manager – Scott McMorrow – was appointed by the Board in 2009 and is presently budgeted for 40 hours per week and generally works out of IPUD’s Administrative Office. The General Manager presently oversees four equivalent fulltime employees that include an operations manager that coordinates and oversees both the water system and fire protection duties. Legal services are provided by contract with County of Marin County Counsel.

IPUD Administrative Offices



Current IPUD Administration

Table 4-27 (IPUD)

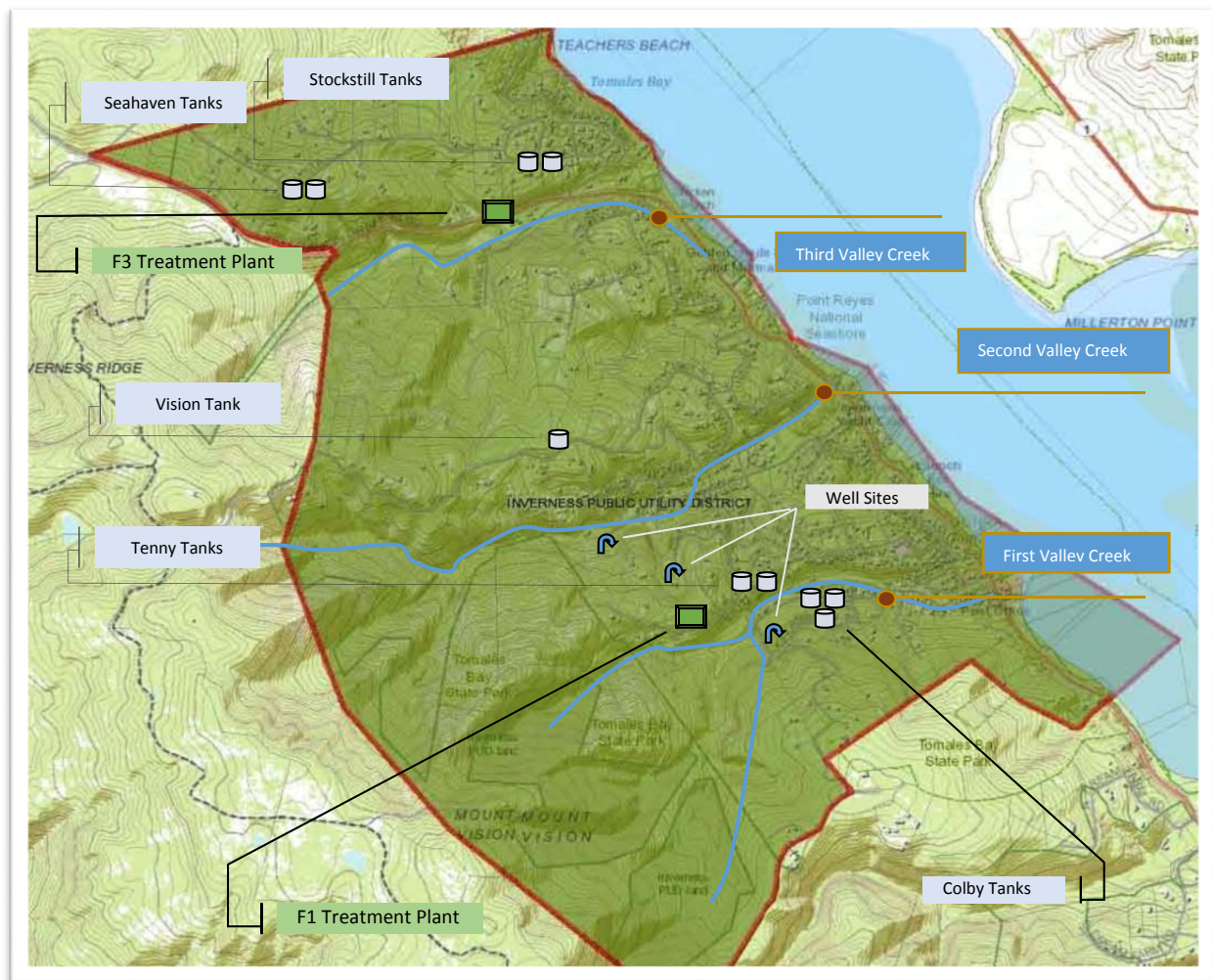
General Manager.....	Scott McMorrow
Legal Counsel.....	County Counsel
Water System Operator.....	James Fox

6.0 Potable Water Services

6.1 Service Overview

IPUD directly provides retail potable water services through its own supply, treatment, storage, and distribution facilities. These facilities were originally constructed through private means beginning in the 1890s by the Inverness Water Works Company and later the Inverness Water Company. IPUD purchased and assumed responsibility for the water system in 1980. The distribution system presently spans approximately 10.5 miles with close to 40% having been replaced following damage caused by the 1982 storm event. IPUD reports additional improvements made through the end 1980s have left the distribution system in good shape with no current replacement needs. The water system itself spans close to four-fifths of IPUD's jurisdictional boundary with the notable absence residences off of Highland Way and Upper Vision Road due to topography.

An overview of IPUD's water system in terms of key infrastructure is shown below.



6.2 Supplies

IPUD's potable water supplies are all locally sourced and drawn from surface and groundwater sites lying within the approximate 400 square mile Tomales Bay watershed. These local sources collectively provide IPUD with potential access to an estimated *maximum* available annual yield of 526.2 acre-feet based on applicable flow and conveyance capacities. A summary of IPUD's primary and supplemental water source supplies follows.

IPUD's potable water supplies are all locally sourced and drawn from surface and groundwater sites within the District. The majority of IPUD's supplies are drawn from pre-1914 rights to First, Second and Third Valley Creeks.

Primary Sources

Surface supplies collectively serve as IPUD's principal water source and are primarily drawn from eight diversion points tied to three perennial creeks that bisect the District and termed "First," "Second," and "Third Valley"; all of which are tributaries to Tomales Bay. These surface diversions are permitted with the State Water Resources Control Board and categorized as pre-1914 appropriative rights and available to IPUD throughout the year and not subject to any external limitations. All eight of these diversion points are located at higher elevation to the remainder of the water system and convey water directly and by gravity to IPUD's treatment facilities. The total *maximum* annual yield tied to these eight pre-1914 surface diversion points if entirely accessed is estimated at 508 acre-feet with these sources accounting for 85% of IPUD's water supplies drawn at the term of the study period (emphasis).⁷⁷

IPUD's maximum annual potable water supply yield is estimated at 526.2 acre-feet based on applicable flow capacities.

Secondary Source(s)

IPUD maintains permits to two other surface diversions to First and Second Valley Creeks that are used as needed. These permits are categorized as post-1914 appropriative rights and can be accessed year-round subject to certain restrictions. Water captured from these two diversion points are located at lower elevation and require pumping stations to convey to IPUD's treatment facilities. IPUD accesses these two lower elevation sources usually during the summer months as needed and they provide a combined *maximum* monthly yield of 22 acre-feet between June and November (emphasis).⁷⁸ IPUD also operates three shallow groundwater well sites to supplement

⁷⁷ Total maximum annual water yield for the eight pre-1914 surface sources is based on IPUD calculating the maximum flow and capture rate at each diversion point with the latter ranging from 35 to 70 gallons per minute.

⁷⁸ Total maximum annual water yield for the two post-1914 surface sources is based on the permit restrictions that limit withdraws from the two lower diversion sources to 30 gallons per minute and only between June 1st and November 15th. IPUD is authorized to take up to 50% of available flows thereafter as needed

the District’s surface supplies as needed. All three wells are located at lower elevation and require pumping to convey to IPUD’s treatment facilities. Use of the wells is limited by practice to summer months and the combined *maximum* annual yield if run continuously is 11.3 acre-feet (emphasis).⁷⁹

Supply Average

IPUD’s average yield drawn over the study period from the District’s eight primary surface diversions along First, Second, and Third Valley Creeks has been 23.927 million gallons or 73.42 acre-feet.⁸⁰ The single-highest year use of these surface sources over the study period occurred in 2012 when IPUD collectively drew 24.716 million gallons or 75.8 acre-feet; an amount that exceeded the average annual take by close to one-twentieth.⁸¹ IPUD has also exercised its annual permit right over the same five year period to draw close one-quarter or 6.0 acre-feet of its allocation from its two lower elevation diversion points along First and Second Valley while groundwater extraction has been limited.

IPUD’s average annual potable water yield over the study period from its surface and groundwater sources has been 79.4 acre-feet.

Supply Reliability

Similar to other public water service providers in West Marin the reliability of IPUD’s water supply is relatively safe from external restrictions given they are entirely locally sourced. IPUD also benefits from its surface sources lying within a relatively secure watershed – less the risk of wildfire – that is protected from future intensive development activities given its inclusion within the Point Reyes National Seashore. The principal supply is also generated at elevation and allows for gravity conveyance to the District’s treatment facility; the latter of which mitigates the need for pumping. There are also no other significant licensed claims or permits on the surface supplies.⁸² The lone – albeit significant – restrictions to IPUD’s water supplies are climate patterns affecting rainfall for runoff and salinity intrusion into the creeks and groundwater sources from Tomales Bay.

⁷⁹ Two of the three wells have a capacity of 1.5 gallons per minute; a third well rates at 4.0 gallons per minute.
⁸⁰ Statement reflects IPUD filings with the State Resources Control Board between 2013 and 2009.
⁸¹ IPUD reports annual production from these primary water sources exceeded 90 acre-feet in the 1990s and primarily as a result of high usage tied to two specific users. IPUD worked with both users to facilitate plumbing and conservation efforts and successfully lowered their demands going forward on the system.
⁸² There is one other appropriative right tied to any of the three surface sources (First, Second, and Third Valley Creeks) as allowed by the State Resources Control Board. This post-1914 right has been issued to a private party and authorizes the annual withdraw of 3.2 acre-feet.

IPUD performed an assessment of its water supplies in 1982 following the year's earlier storm event and as part of a system needs evaluation.⁸³ No update to this analysis has been performed to date. Accordingly, and for purposes of this planning document, it appears reasonable to assume some significant level of curtailment will occur during dry periods reducing the overall supply available to IPUD. With this in mind, the Commission projects IPUD's primary water supply sources and groundwater being curtailed up to 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought.⁸⁴ The remainder of IPUD's supply sources are also curtailed, though at a lesser extent – up to 38% – based on a modified calculation as described in the accompanying footnote.⁸⁵ The substantive effect of applying this drought curtailment projection is IPUD's annual water supply being reduced from its normal/maximum level of 526.2 acre feet to 135.98 acre-feet.

LAFCO calculates IPUD's maximum annual potable water supply during a severe drought curtailing to 136 acre-feet and based on applying aggregate weather conditions as experienced during the 1976-1977 drought.

The following table summarizes IPUD's water supply sources relative to right/permit allowance, normal/max year conditions, and drought year conditions.

IPUD's Potable Water Supply Availability						
Listed in Acre-Feet Table 4-28 (Marin LAFCO / IPUD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To IPUD	Convey Year Max To IPUD	76-77 Drought To IPUD	76-77 Drought Year Max To IPUD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
First Valley Creek (8927)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
First Valley Creek (8928)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
First Valley Creek (8929)	-- pre 1914 --	-- pre 1914 --	0.30	109.5	0.07	26.28
Second Valley Creek (8930)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
Second Valley Creek (8931)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
Second Valley Creek (8944)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
Third Valley Creek (8945)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
Third Valley Creek (8946)	-- pre 1914 --	-- pre 1914 --	0.15	54.75	0.04	13.14
Lower Elevation: First	0.79	13.30	0.79	13.30	0.49	5.80
Lower Elevation: Second	0.53	8.87	0.53	8.87	0.38	9.21
Groundwater Sites	-- overlying --	-- overlying --	0.03	11.29	0.00	2.71
	Total Yield		2.70	526.2	1.22	135.98

⁸³ IPUD prepared an assessment of the District's water system in 1982 and in response to earlier in the year. This assessment was prepared by outside engineering consultant. These flow projections remain in use and were utilized by IPUD most recently in a 2011 Engineer Report in successfully renewing the District's domestic water supply permit.

⁸⁴ State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies to 24% of normal/maximum.

⁸⁵ LAFCO has adjusted this curtailment upwardly to 38% for IPUD's permitted water supplies given these sources already incorporate a baseline reduction in total flows through a permit process managed by the State Water Resources Control Board.

LAFCO Calculation
To Parallel 1976-77
Drought Conditions

Notes for Water Supply Table:

- 1) Water supply totals for IPUD's two lower elevation diversion points only show permitted allowances during summer months (June 1st to November 15th). IPUD is allowed to draw water the remainder of the year from these sources to equal no more than 50% of the flow, but without reservoirs it is not utilized.
- 2) Pre 1914 water appropriative rights are not subject to external limitations on the amount of water diverted from the affected source and can only be lost through no-use or abandonment.
- 3) Overlying groundwater rights allow for the unrestricted use of water for the beneficial use to lands that are located over the affected aquifer and can only be lost through judicial action.
- 4) Drought year conditions for IPUD's primary water sources and groundwater – all of which are not subject to external permitting - reflect a 76% reduction compared to normal/max year conditions and based on matching the Department of Water Resources' calculation for surface supply curtailment in California during the 76-77 drought. The remaining supplies at lower elevation points are reflect a 38% reduction based on a modification to the referenced calculation made by the Department of Water Resources.

6.3 Water Treatment Facilities

IPUD provides chlorine disinfectant treatment of its local raw water sources at one of its two treatment facilities termed "F1" and "F3." The combined treatment capacity of the two facilities is 0.172 million gallons or 0.53 acre feet *if* run continuously (emphasis). This latter amount equals 19.6% of the righted/permitted water supplies potentially available to IPUD under maximum conditions.

IPUD's combined treatment capacity totals 120 gallons per minute and if run continuously equals a daily production of 0.53 acre-fee; an amount that is currently two-thirds greater than average peak-day water demand - 0.37 acre-feet – within the District over the course of the study period.

F1 is the main facility and runs year-round to serve Old Inverness and surrounding areas and treats raw water conveyed by gravity from six of the eight main diversion points off of First and Second Valley Creeks; it also treats water drawn by pump from the two lower elevation diversion points as well as from the three groundwater sites. F1 was constructed in 1983 and equipped with two membrane sediment filters to separate organic/inorganic materials; no chemicals are used to assist in coagulation. Chlorine is added to filtered water before being pumped into the storage/clearwell tanks and gravity fed into the distribution system. Chlorine contact is achieved in the transmission line. The daily treatment capacity at F1 is 100 gallons a minute and *if* run continuously results in a daily maximum total of 0.144 million gallons or 0.44 acre-feet (emphasis). This daily capacity at F1 equals 18.3% of the 2.40 acre-feet of righted/permitted water from the associated water sources.

F3 is operated as needed to serve Seahaven and treats raw water conveyed by gravity from the remaining two main diversion points tied to the Third Valley Creek. F3 was constructed in 1980 and its treatment process mirrors F1 with one notable distinction: the daily treatment capacity is 20 gallons per minute. This latter feature translates into a daily maximum capacity *if* run continuously of 0.021 million gallons or 0.06 acre-feet (emphasis). This daily capacity at F3 equals 20.0% of the 0.30 acre-feet of righted/permitted water from the associated water sources.

IPUD's Water Treatment Facilities		
Table 4-29 (Marin LAFCO / IPUD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Facility One "F1"	sodium hypochlorite (chlorine)	144,000 gallons / 0.44 acre-feet
Facility Three "F3"	sodium hypochlorite (chlorine)	28,800 gallons / 0.09 acre-feet
Total		172,800 gallons / 0.53 acre-feet

6.4 Water Quality

IPUD's most recent water quality report was issued in June 2015 and covers sample testing for 2014 with a majority performed in October. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the State Water Resources Control Board (SWRCB); the former addressing public health and the latter addressing taste and appearance. The testing identified primary contaminant violations for exceeding levels of haloacetic acids over multiple sample tests and attributed to excessive chlorine contact with certain organic/inorganic materials. Testing also identified secondary violations for exceeding levels of iron and color. IPUD is working with SWRCB on an action plan to lower the haloacetic acid levels going forward; results of these efforts are not known at this time.

IPUD's last water quality report shows exceeding levels for the primary containment haloacetic acids and secondary containments iron and color in water samples tested in 2014.

6.5 Water Distribution System and Storage Facilities

IPUD's potable distribution system consists of approximately 10.5 miles of mains and overlays seven connected pressures zones that collectively cover a 300 foot range in elevation between service connections. The system relies on both gravity and pumping for recharge. Though ultimately connected, the distribution system itself comprises two distinct subsections based on receiving treated water directly from either F1 or F3 that has a combined and total storage capacity of 425,000 gallons or 1.30 acre-feet; the latter amount equal to 16.9% of the current average day demand.

IPUD's potable storage capacity within the distribution system totals 1.3 acre-feet and provides 3.5 days of coverage in meeting the average peak-day demand generated during the study period.

The portion of the distribution system directly tied to F1 begins with treated water pumped to the "Tenny Zone" and thereafter charging the "Colby Zone" (gravity), "Lindeim Zone" (pump), and "Vision Zone" (pump); the former two, notably serving as the main customer base and representing three-fourths of all IPUD connections. Storage within the F1 portion of the distribution system is tied to seven tanks with a combined holding capacity of 0.300 million gallons or 0.92 acre-feet. The portion of the distribution system directly tied to F3 begins with treated water from Third Valley Sources pumped to the "Seahaven Zone" and thereafter charging the "Seavhaven Zone 2" (gravity) and

“Stockstill Zone” (pump). Storage within the F3 portion of the distribution system is tied to four tanks with a combined holding capacity of 0.125 million gallons or 0.38 acre-feet.

IPUD’s Potable Storage Tanks			
Table 4-30 (Marin LAFCO / IPUD)			
Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Tenny	31.0		70,000 gallons / 0.21 acre-feet
Colby	43.0		130,000 gallons / 0.40 acre-feet
Lindhheim	1.0		above
Vision	1.4		100,000 gallons / 0.31 acre-feet
Seahaven	8.0		85,000 gallons / 0.26 acre-feet
Seahaven 2	3.6		above
Stockstill	12.0		40,000 gallons / 0.12 acre-feet
Total:		425,000 gallons / 1.30 acre-feet	

6.6 Service Connections

IPUD serves 509 active potable water service connections as of the study period term and divided between 491 residential and 18 non-residential customers; the latter of which includes all commercial users. IPUD’s connection total has been relatively unchanged over the last several years and highlighted by the addition of only three new water connections over the past five year period; all of which are tied to new residential construction in the Vision area. IPUD reports none of the current water connections lie outside its jurisdictional boundary.

Trends in IPUD’s Potable Water Connections						
Table 4-31 (IPUD)						
Category	2009	2010	2011	2012	2013	5-Year Change
Non Residential	18	18	18	18	18	0.0%
Residential	488	489	490	490	491	0.6%
	506	507	508	508	509	0.6%

6.7 System Demands

IPUD’s average annual water production demand over the **study period** has been 23.204 million gallons or 71.2 acre-feet (see footnote 37). The most recent completed year showed total demand at 26.0 million gallons or 79.78 acre-feet. This recent amount represents an average daily water demand for the entire distribution system of 0.071 million gallons or 0.22 acre-feet; an amount that is further broken down to 139 gallons per day for every service connection. Per capita use has similarly increased relative to per connections with a five year average of 45 gallons. The peak-day

IPUD’s average annual potable water production demand over the study period has been 71.2 acre-feet and translates to 125 gallons per day for every active connection. The average daily water demand per resident during this period is 45 gallons. Overall water demand production has increased on average by 1.7% annually and surpasses the corresponding percentage change in population by more than fourteen-fold.

demand – the highest one day sum for the affected year – totaled 0.137 million gallons or 0.42 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.91.

With respect to recent trends, IPUD has experienced an overall increase of 8.4% in water demands over the last five year period or 1.7% annually and largely attributed to a sharp rise in usage between 2012 and 2013. It is also noted IPUD experienced a sharp decrease in annual use in 2010 and is attributed to concerted conservation efforts led by IPUD and followed through by constituents in response to dry conditions. The overall increase in water demand, nonetheless, exceeds the estimated population growth within IPUD by over a factor of two and suggests land use intensification is driving new usage given actual new development has been limited to three new connected residences.

Study Period Trends in IPUD’s Water Demand Production							
Table 4-32 (Marin LAFCO / IPUD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	73.6	64.3	67.5	70.6	79.8	71.2	8.4%
Average Day	0.20	0.18	0.18	0.19	0.22	0.19	8.4%
Connections	506	507	508	508	509	508	0.6%
Per Day Connection	130g	113g	119g	124g	139g	125 gallons	6.9%
Per Day Resident	48g	43g	43g	45g	52g	45 gallons	8.3%
Peak Day	0.40	0.33	0.36	0.36	.42	0.37	5.0%
Peaking Factor	2.0p	1.83p	2.0p	1.89p	1.91p	1.95 peaking	(4.5%)

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Projecting forward – and specifically for purposes of this study – it appears reasonable to assume IPUD’s water demands within its existing jurisdictional boundary will continue to increase and largely as a result of the continued intensification of water uses among existing service connections paired with a small amount of new development. It is estimated, accordingly and using linear regression to control for large variances in the most recent year-end totals, the system will experience an overall increase in water demand of 6.5 acre-feet over the next 10 years to 2023; a difference of 8.1% or 0.8% annually and a deceleration of more than two-fold relative to the overall rise in the last five year tracked period.⁸⁶ It is also estimated the system’s peak-day demands will trend consistent with recent amounts and the current four year average peaking factor of 1.95 – which incorporates recent variances as is – will hold and produce a high-day usage demand of 0.46 acre-feet by 2023. The following table summarizes projected demands in IPUD over the next ten years.

LAFCO projects IPUD’s annual water demands will increase by 6.5 acre-feet or 0.8% annually by 2023; an intensity decrease in use of one-third compared to usage over the last five tracked years. The anticipated daily usage is expected to modestly rise from 52 to 55 gallons per resident by 2023.

⁸⁶ The calculated difference between annual usage change over the last five years – (.34%) – and the projected annual usage change over the next 10 years – 0.26% – is 176.5%.

LAFCO Projected Trends in IPUD’s Water Demands
 Table 4-33 (Marin LAFCO)

Category	Baseline	2015	2017	2019	2021	2023	10-Year Change
Annual Total	79.8	76.1	78.1	82.2	84.2	86.3	8.1%
Average Day	0.22	0.21	0.21	0.23	0.23	0.24	9.1%
Peak Day	0.42	0.41	0.42	0.44	0.45	0.46	9.5%
Connections	509	510	511	513	514	515	1.2%
Per Day Connection	125g	133g	136g	143g	146g	150g	20.0%
Residents	1,375	1,378	1,382	1,385	1,388	1,392	1.2%
Per Day Resident	52g	49g	50g	53g	54g	55g	5.8%

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Notes to LAFCO Projected Trends in Water Demands:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2009 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 1.95 ratio over average day demands based on 2009 to 2013 data.

6.8 Infrastructure Capacities to Demands

IPUD’s water infrastructure is currently operating with available capacity in supply, storage, and treatment as it relates to accommodating existing average demands generated during the study period. These capacities are also expected to sufficiently accommodate anticipated demands over the next 10 years with one possible exception; IPUD’s projected peak-day demand is approaching the District’s daily treatment capacity and expected to effectively equal production by 2023. Improvements therein are needed to expand treatment capacity to ensure adequate supplies and pressure is available during high demand periods, which can be further exacerbated in a fire event as has occurred in the recent past, and/or reduce peak usage.

The following statements summarize and quantify existing and projected relationships between IPUD’s capacities and demands now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Water Supply:

- Average annual water production demands generated over the study period represent 14% of IPUD’s projected accessible sources under normal conditions. No substantive change in this ratio is expected through 2023.
- Average annual water production demands generated over the study period represent 52% of IPUD’s projected accessible sources under projected single dry-year conditions. This ratio is expected to rise by one-fifth to 63% by 2023.

Peak-Day
Ratios

- Average peak-day water production demands generated over the study period represent 14% of the new daily supply available to IPUD under normal conditions. This ratio is expected to rise to 17% by 2023.
- Average peak-day water production demands over the study period represent 30% of the new daily supply available to IPUD under projected single dry-year conditions. This ratio is expected to rise to 38% by 2023.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 70% of IPUD's existing potable treatment capacity. This ratio is expected to approach closer to capacity at 87% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 29% of IPUD's existing potable storage capacity. This ratio is expected to rise to 35% by 2023.
- All seven pressure zones within IPUD's distribution system have adequate dedicated potable storage in meeting their proportional share of the District's current-peak day demands. No substantive change in these storage ratios is projected going forward through 2023.
- IPUD's potable storage capacity can accommodate up to 3.5 consecutive days of average peak-day demands generated over the study period without recharge. This capacity is projected to decrease to 2.8 days by 2023.

Water Conservation / Mitigation:

- IPUD's administration has proven effective in soliciting reductions in demands to match supplies in prior dry year conditions as evident most recently in 2010 when use declined by 12.6% over the prior year usage.
- IPUD reports the water system was successfully stress-tested during the 1976-1977 drought as supplies were sufficient in meeting constituent demands. This prior stress-test suggests – albeit in the absence of 40 years of subsequent environmental changes and demand increases - the water supply may be more resilient and outperform the projections in this study in drought conditions.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 is provided below.

IPUD's Capacity Relative to <u>Current</u> Average Demands			
Table 4-34 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply	✓		
...normal conditions	✓		
...single dry-year conditions	✓		
Water Storage	✓		
Water Treatment	✓		

IPUD's Capacity Relative to <u>Projected</u> Demands by 2023			
Table 4-35 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply	✓		
...normal conditions	✓		
...single dry-year conditions	✓		
Water Storage	✓		
Water Treatment		✓	

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

IPUD relies on two separate charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) basic charges. The user charge is set by Board ordinance and applied bimonthly and is intended to fund basic operations of the water system. The user charge was last updated during the course of the study period in July 2009 and is in tier format to apply an escalating rate based on consumption tiers per billing period with current average meter uses producing a bimonthly charge of \$25.94.⁸⁷ The basic charge serves as an availability fee and applied to all IPUD parcels irrespective of active or inactive status and applied bimonthly at a flat \$100.00 amount. There are no voter approved special assessments tied to the water system. The cumulative cost for most IPUD customers is \$755.64 annually and results in a per 100 gallon equivalent charge of \$1.48 based on rates as of January 2015 and average uses generated during the study period.

The current average residential customer based on study period totals in IPUD is paying \$755.64 annually in direct water charges based on a daily usage of 140 gallons. This produces an approximate ratio of \$1.48 for every 100 gallons.

⁸⁷ Average bimonthly usage charge based on 139 gallons per day or 8,459 gallons every two months.

7.0 Agency Finances

7.1 Financial Statements

IPUD currently contracts with an outside accounting firm (Doran and Associates) to prepare an annual report for each fiscal year to review the District’s financial statements in accordance with established governmental accounting standards. This includes, most notably, assessing IPUD’s statements with respect to verifying overall assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing IPUD’s short and long-term fiscal health.

IPUD’s most recent financial statements for the study period were issued for 2012-2013 and shows the District experienced a modest and positive change over the prior fiscal year as its overall equity or fund balance increased by 5.4% from \$2.980 to \$3.141 million and generally tied to an operating surplus of \$0.164 million. A summary of year-end totals and corresponding trends in assets, liabilities, and equity over the study period are show in the following subsections.

2012-2013 Financial Statements	
Assets	\$3.250 m
Liabilities	\$0.105 m
Equity	\$3.141 m

Agency Assets

IPUD’s audited assets at the end of 2012-2013 totaled \$3.250 million and have increased during the last five years by nearly one-tenth. Assets classified as current with the expectation they could be liquidated have remained relatively stagnant over the last five reported years and presently represent 55% of the total amount with the majority tied to cash and investments. Assets classified as non-current have increased by nearly one-fifth over the last five reported years and present represented the remaining 45% of the total and generally split between buildings/infrastructure and prepaid other post-employment benefits.

IPUD Assets Study Period						
Table 4-36 (IPUD)						
Category	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current	1.749	1.685	1.629	1.723	1.791	2.4%
Non-Current	1.263	1.516	1.421	1.395	1.459	15.5%
	\$3.012	\$3.201	\$3.051	\$3.118	\$3.250	7.9%

amounts in millions

Agency Liabilities

IPUD’s audited liabilities at the end of 2012-2013 totaled \$0.105 million and have decreased by nearly four-fifths – (80%) – over the last five reported years. Current liabilities representing obligations owed in the near-term account for less than 10% of the total and mostly tied to accounts payable. Non-current liabilities represented the remaining amount and closely tied to compensated absences and deferred revenue sources involving yet-to-be provided services.

IPUD Liabilities Study Period						
Table 4-37 (Marin LAFCO)						
Category	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current	0.195	0.080	0.060	0.066	0.007	(96.0%)
Non-Current	0.334	0.347	0.122	0.071	0.097	(70.7%)
	\$0.530	\$0.428	\$0.183	\$0.138	\$0.105	(80.0%)

amounts in millions

Agency Equity / Net Assets

IPUD’s audited equity / net assets at the end of 2012-2013 totaled \$3.141 million and represent the difference between the District’s total assets and total liabilities. This amount has increased by slightly over one-fourth over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with the aforementioned reduction in liabilities. The end of year equity amount includes a \$0.241 million in unrestricted funds that can be used for any purpose.

IPUD’s unrestricted fund balance total of \$0.241 million equates to a per capita amount of \$175 as of the term of the study period.

IPUD Equity Study Period						
Table 4-38 (IPUD)						
Category	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Unrestricted	1.518	1.535	1.446	0.023	0.241	(84.1%)
Restricted	-	-	-	1.586	1.594	0.5%
Capital	0.964	1.238	1.421	1.370	1.305	35.5%
	\$2.482	\$2.773	\$2.868	\$2.980	\$3.141	26.5%

amounts in millions

* IPUD established a new designation within its fund balance termed “restricted” beginning in 2011-2012. This designation provides funding resources for various administrative expenses as well as allocating \$0.750 million for Board declared emergencies.

7.2 Liquidity, Capital, and Margin

A review of the last five audited financial statement issuances by IPUD covering the study period shows the District generally finished each year in strong financial position and highlighted by persistent and increasing gains in profitability with a near triple gain in operating margin. IPUD has also improved its capital standing over the study period by reducing its long term obligations by four-fifths and ending with a notably low debt-to-net asset ratio of 3%. IPUD’s liquidity levels have also stayed relatively stagnant over the first four years of the five year period before skyrocketing in the final year byway of the reduction in short-term dues and finishing with current assets outpacing current liabilities by 227 to 1. A summary of year-end liquidity, capital, and operating margin ratios and trends therein follows.

Recent Trends in IPUD Liquidity, Capital, and Margin Study Period			
Table 4-39 (Marin LAFCO / IPUD)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	8.9 to 1	13.5%	6.3%
2009-2010	20.8 to 1	12.5%	24.2%
2010-2011	26.8 to 1	4.3%	10.4%
2011-2012	25.8 to 1	2.4%	12.7%
2012-2013	226.9 to 1	3.1%	18.0%
Averages	61.68 to 1	7.2%	14.3%
5-Year Trend	24.4%	(77.0%)	186.7%

7.3 Pension Obligations

IPUD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. IPUD maintains two distinct contract packages – one for public safety (fire) and one for non-public safety (water); the latter of which is the focus of this study. The contract for non-public safety employees is divided between allowances – “Tier One” and “Tier Two.” Tier One for non-public safety is based on a 2.0% at 60 formula and would provide an eligible retiree with 20 years of total service credit 40% of their highest average three year salary range beginning at age 60 and continuing each year thereafter until death. Tier Two is for employees hired after January 1, 2013 and is based on a 2.0% at 62.

IPUD’s Defined Pension Benefit Tiers – Non Public Safety	
Table 4-40 (Marin LAFCO / CalPERS)	
Category	Miscellaneous
Tier One (Pre January 2013).....	2.0% at 60
Tier Two (Post January 2013).....	2.0% at 62

Funding contributions for IPUD is based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arraignments between the District and its employees. A listing of recent and planned contribution rates for IPUD’s non-public safety employees as determined by CalPERS along with enrollee information follows.

IPUD’s Minimum Contribution Rates to CalPERS – Non Public Safety					
Table 4-41 (Marin LAFCO / CalPERS)					
11-12	12-13	13-14	14-15	15-16	Trend
12.66%	14.96%	14.51%	13.75%	14.40%	14.3%

Projected

IPUD’s Pension Enrollee Information	
Table 4-42 (Marin LAFCO / CalPERS)	
Enrollee Type	As of June 30, 2013
Active.....	4
Transferred.....	1
Separated.....	1
Retired.....	3

IPUD’s total annual pension contributions are on the rise in step with increasing liability based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. Overall IPUD has increased its total annual pension contributions by 33.3% from \$0.027 million to \$0.036 million over the last three reported years; a change that exceeds the corresponding inflation factor for the San Francisco Bay area region during this period of 5.0% by over six-fold. This increase in contributions has helped to improve IPUD’s funded ratio – the market difference between the pension plan’s assets and liabilities – by 4.0% and ended the period at 74.7%. IPUD’s unfunded liability – pension monies owed that are not covered by assets – has also correspondingly decreased by (3.8%) from \$0.208 million to \$0.200 million; an amount that equals 83.0% of the District’s undesignated fund balance as of the start of 2013-2014.⁸⁸ IPUD’s worker-to-retiree ratio has also decreased by nearly one-fourth over the three-year period from 1.7 to 1.3.

IPUD’s unfunded pension liability has decreased over the last three reported years and currently totals \$0.2000 million; an amount that equals 83.0% of the District’s undesignated fund balance as of the start of 2013-2014.

IPUD Trends in Pension Measurements				
Table 4-43 (Marin LAFCO / CalPERS)				
Category	2010-2011	2011-2012	2012-2013	Difference
IPUD Annual Contribution	\$0.027 million	\$0.031 million	\$0.036 million	33.3%
Funded Ratio – Market	71.8%	69.6%	74.7%	4.0%
Unfunded Liability - Market	\$0.208 million	\$0.232 million	\$0.200 million	(3.8%)
Funded Ratio – Actuarial	80.3%	82.7%	-	-
Unfunded Liability -Actuarial	\$0.146 million	\$0.132 million	-	-
Active to Retiree Ratio - active employees for every retiree	1.7	1.3	1.3	(23.5%)

Notes:

- 1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now).
- 2) Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.) CalPERS no longer calculates AVA measurements as of the 2012-2013 fiscal year.

⁸⁸ IPUD’s undesignated fund balance (audited) as of June 30, 2013 totaled \$0.241 million.

7.4 Revenue and Expense Trends

IPUD has maintained positive revenue to expense differences in each of the five years covering the study period. These ongoing surpluses have resulted in a year-end average operating net of \$0.143 million. Average year-end revenues over this period have totaled \$0.955 million with four-fifths of this amount equally divided between water utility charges (42.0%) and property taxes (40.8%). Average year-end expenses over the same period have totaled \$0.812 million with general administration (36.6%) expenses averaging the single largest expenditure followed by salary and benefits (24.2%). With respect to trends, IPUD enjoys a positive operational relationship in which revenues are outperforming expenses with the former rising overall by 5.6% and the latter falling overall by (7.6%) over the five year period. The positive trend is primarily tied to consistent and annual gains in IPUD’s two main income categories - property taxes and water utility charges – while nearly all of the District’s expense categories have decreased with one notable exception: salaries and benefits. A summary of actual averages in both revenue and expense ledgers follows.

IPUD has maintained positive year-end operating balances during the study period with an average net of 17.6% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than double.

Recent Actual Trends in IPUD Revenues Study Period			
Table 4-44 (Marin LAFCO / IPUD)			
Category	Five Year Average (2008-09 to 2012-13)	Five Year Average Portion of Total	Five Year Trend (2008-09 to 2012-13)
Water Service Charges	395,104	42.0	12.4%
Property Taxes	382,592	40.8	11.3%
Grants	23,527	2.6	(100%)
Interest/Investments	11,130	1.2	(57.7%)
Other	143,183	15.0	n/a
Trends	\$955,536	100%	5.6%

* Rounding Applied

Recent Actual Trends in IPUD Expenses Study Period			
Table 4-45 (Marin LAFCO / IPUD)			
Category	Five Year Average (2008-09 to 2012-13)	Five Year Average Portion of Total	Five Year Trend (2008-09 to 2012-13)
General Administrative	290,781	35.9	(8.2%)
Salaries and Benefits	270,159	33.7	80.3%
Fire Dispatch	24,084	3.0	(6.1%)
Water Collection/Treatment	15,671	1.9	8.4%
Water Storage/Distribution	14,845	1.9	(2.0%)
Laboratory Work	8,661	1.1	(11.7%)
Repairs/Maintenance	6,432	0.8	(89.6%)
Other	181,651	22.4	n/a
Trends	\$812,284	100%	(7.6%)

* Rounding Applied

C. MUIR BEACH COMMUNITY SERVICES DISTRICT

1.0 Overview

The Muir Beach Community Services District (MBCSD) was formed in 1958 and encompasses an approximate 1.3 square mile jurisdictional boundary along the southwest coast to the Pacific Ocean. Governance is provided by a five-person board whose members are registered voters elected at large to staggered four-year terms. Access to MBCSD’s jurisdictional boundary is primarily tied to Pacific Coast Highway (1). The community itself is approximately six miles from the nearest incorporated community, Mill Valley, and lies within the Tamalpais Union School District and assigns students absent of transfer to Tamalpais High.

Seascape Subdivision



MBCSD is currently organized as a multi-purpose agency and provides four distinct services: (a) potable water; (b) roads; (c) fire protection; and (d) park and recreation. Existing development in MBCSD is anchored by two residential subdivisions, Muir Beach and Seacape. Non-residential uses are limited, but include the Pelican Inn and the Green Gulch Farm and Zen Center. Close to two-thirds of MBCSD also lies within the Golden Gate National Recreational Area and includes two

Muir Beach CSD

Formation Date	1958
Enabling Legislation	Government Code Section 61000 et. seq.
Service Categories	Potable Water Fire Protection Parks and Recreation Roads
Service Population	431
Registered Voters	270
Current Buildout Population Estimate	459

prominent visitor sites: Slide Ranch and Muir Beach; the latter of which is connected to the District’s potable water system. All potable water supplies are locally drawn from Redwood Creek and secured through a permit with the State Water Resources Control Board. The average annual water demand for MBCSD over the study period has been 8.2 million gallons or 25.3 acre-feet and represents a daily capita use of 53 gallons.⁸⁹

MBCSD’s service area – collectively referenced to as “Muir Beach” – is one of 20 formally defined unincorporated communities in Marin County. The current resident total within MBCSD counting both fulltime (300) and part-time (131) is estimated by the Commission at 431 as of the term of this study period. It is also estimated MBCSD’s service population – and specifically those served directly by the District’s potable water system – has increased by 2.0% over the study period and three times higher than the

⁸⁹ This amount is drawn from total water production between 2009 and 2013 and calculated using the Commission’s own resident population projections for MBCSD.

countywide growth rate average of 0.6% over the same period.⁹⁰ The projected buildout population as calculated by the Commission and based on current planning policies of the land use authority (County of Marin) is estimated at 459.⁹¹ Registered voters total 270 and represents 62% of the estimated population. MBCSD's operating budget at the term of the study period was set at \$0.365 million with funding for the equivalent of 3.0 employees. The unrestricted fund balance was \$0.828 million and sufficient to cover two years of general operating expenses based on the 2013-2014 budget.

2.0 Background

2.1 Community Development

MBCSD's early engineering reports note the District's present-day service area began developing in earnest in the early 1920s.⁹² This initial development was tied to the division and selling of private lots near the community's lower coastline along Pacific and Sunset Ways by the area's modern-day patriarch, Antonio Bello. The development of the lower coastline – and specifically the approximate 40-acre Muir Beach Subdivision (formerly titled Bello Beach) – appears to have been relatively modest at first with cabins serving as the dominant construction type and primarily tied to accommodating mostly seasonal housing for vacationing urbanites.



⁹⁰ The resident population is specific to MBCSD's water service area; the population within the District's fire service area is likely to be slightly larger. The projected fulltime/part-time resident ratio of 70% to 30% has been calculated by LAFCO and is for informational purposes only and does not incorporate the potential for non-owner fulltime residents in MBCSD. The actual calculation is detailed in Section No. 4.1.

⁹¹ Current and projected service populations are detailed in Section 4.1.

⁹² Background information is principally drawn from prior LAFCO reports and substantially supplemented by MBCSD information posted on the agency's website: www.muirbeachcsd.com.

Organized water service within the community was established in step with the referenced lot divisions with the creation of the Muir Beach Company in 1928, and the subsequent creation of the Muir Beach Water Company. Water was sourced from groundwater wells and was generally low quality but adequate for the modest seaside community. The initial baseline – specifically incremental development of cabins for vacationing upper class as well as blue-collar dairy workers – eventually gave way to more permanent housing being constructed by the 1950s. Notably, this included plans for a second residential subdivision along the higher coastline to be known as Seacape to accommodate an increasing influx of new residents highlighted by an emerging artist community.

Muir Beach’s transformation towards becoming a fulltime community by the middle of the 1950s proved pivotal for water service as demands within the developing area began to outpace capacities for the Muir Beach Water Company and its lower elevation well sites. Many residents reportedly began trucking in potable water as the wells operated by the Muir Beach Water Company were becoming increasingly prone to poor water quality (brackish and poor aesthetics) and outright outages due to longer recharge periods coupled with limited funding to make improvements. This dynamic led to the formal submittal of a landowner petition in 1957 to the County of Marin Board of Supervisors – then the acting authority to approve such a request – for the formation of a new community services district.

2.2 Formation Proceedings

The formation of MBCSD was completed in 1958 with the County of Marin’s Boundary Change Commission approving the official service area of the District followed by a successful vote of residents.⁹³ The original boundary included approximately 790 acres of unincorporated territory comprising most of the current jurisdictional boundary and anchored by the Muir Beach Subdivision as well as the then-planned Seacape Subdivision. The remaining and majority of the jurisdictional boundary – close to 85% was either undeveloped or in agriculture use with the expectation these surrounding lands would develop as demand for housing and commercial supporting businesses in the community intensified. An initial five-member Board of Directors was also elected along with a special assessment to fund MBCSD’s purchase of the Muir Beach Mutual Water Company and its facilities, and to make needed improvements, including drilling new well sites. Markedly, at the time of its formation, MBCSD was only tasked with providing domestic water services; fire protection, roads, and parks and recreation were later authorized as part of subsequent actions.

⁹³ The County Boundary Commission was a technical governing body tasked with officially designating the jurisdictional boundary of all boundary changes prior to LAFCO’s creation in 1963. The boundary commissions included four distinct members of county government, supervisor chairperson, assessor, auditor, and surveyor.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by MBCSD and/or affecting the District's service area following formation in 1958 is provided below.

- 1960s • MBCSD's residents authorized the District to expand its service powers to include roads and recreation in 1969 as allowed under the agency's principal act. Roads services to date have involved maintaining a limited number of non-County maintained roadways and pedestrian easements within the District's jurisdictional boundary. Funding for road services is provided from property taxes. Recreation services to date have been primarily tied to building and operating a community facility/meeting hall as well as maintaining a community park. Funding recreation services is primarily covered by rental and class fees and supplemented as needed by property taxes.
- 1970s • MBCSD added a second water system with the purchase of the Seacape Mutual Water Company in 1970 through a voter-approved assessment and assumed service responsibilities for the then-developing 60-acre Seacape Subdivision. Construction of the subdivision, pertinently, had been initiated in the mid 1960s and only after the developer (Miwok Corporation) formed the Seacape Mutual Water Company and established a separate supply and transmission system given the capacity limitations tied to MBCSD. The Seacape Mutual Water Company, further, had developed a reliable and high quality well source in Frank Valley and soon after the purchase by MBCSD served as the supply for the entire District.
- MBCSD's residents authorized the District to expand its service powers once again in 1971 to include fire protection and as a successor to the Bello Beach Volunteer Fire Department (VFD). Upon expansion, MBCSD purchased the fire protection equipment of the Bello Beach VFD – which had been operating previously for several years – and created the Muir Beach VFD. In 1994, fundraising and grant-writing activities for Muir Beach VFD were delegated to a new organization, the Muir Beach Volunteer Fireman's Association, a non-profit public benefit corporation.⁹⁴ Funding was later supplemented beginning in 2008 and affirmed in 2012 when MBCSD voters approved a special assessment to apply an annual \$200 levy on each jurisdictional parcel through 2016.⁹⁵

⁹⁴ Muir Beach Volunteer Fireman's Association is a 501(c)(3) as classified as the Internal Revenue Service.

⁹⁵ Measure "E" was passed by MBCSD voters on a 86.9% (127) to 13.1% (19) count on June 5, 2012.

1970s

- The Golden Gate National Recreational Area (GGNRA) was established by Congress in 1972 and covers close to two-thirds of MBCSD’s jurisdictional boundary and includes a portion of Green Valley Gulch and all of Muir Beach and Slide Ranch. The establishment of the GGNRA also effectively locked-in and limited land uses immediately outside MBCSD and memorialized a new service dynamic for the District going forward involving the introduction of day-time visitors. This includes day-time visitors to Muir Woods, the beach at Muir Beach, Muir Beach Overlook, and nearby public trails leading to Muir Woods.⁹⁶
- The County of Marin adopted the Muir Beach Community Plan in 1978. Current guidelines and visioning for the community appear in the Land Use Plan of the Marin County Local Coastal Program, which was adopted by the Board of Supervisors in July 2013 and superseding the Muir Beach Community Plan. The Land Use Plan includes an explicit statement to “maintain the small-scale character of Muir Beach as a primarily residential community with recreational, small scale visitor, and limited agricultural use.” The Pelican Inn site is the only commercially-zoned parcel in MBCSD.

1980s

- MBCSD accepted a formal water service plan for the District in 1987. The service plan was prepared on contract by Harris Consultants and concluded MBCSD’s existing water supply drawn from three shallow wells in Frank Valley provided sufficient resources through the expected build-out of the service area to accommodate 175 connections with a per average daily demand of 100 gallons. The service plan did note storage supplies need to be addressed and in particular the immediate replacement of a 50,000 gallon redwood tank serving the lower pressure zone and the Muir Beach Subdivision.⁹⁷ (A replacement 100,000 gallon tank was constructed the following year, and much later in 2010, a 200,000 gallon tank was constructed to supplement and eventually replace an existing 150,000 gallon tank.)

1990s

- MBCSD’s water supply transitioned from “groundwater” to “underflow” of Redwood Creek based on a determination by the State Water Resources Control Board in 1998. The substantive result was a MBCSD’s supply now being subject to a permit and set allowance as determined by the Board.

2010s

- MBCSD declared a water shortage emergency in August 2014 to prohibit general water waste as well as prescribe certain use requirements therein, including limiting landscape irrigation to no more than twice a week and only on Wednesday and Friday nights. The declaration remains active.

⁹⁶ GGNRA estimates Muir Woods draws approximately 950,000 visitors annually, many of whom pass through Muir Beach. It is also estimated the beach at Muir Beach draws approximately 260,000 visitors annually.

⁹⁷ A replacement 100,000 gallon tank was constructed the following year, and much later in 2010, a 200,000 gallon tank was constructed to supplement and eventually replace an existing 150,000 gallon tank.

2.4 Previous Municipal Service Review

The Commission’s inaugural municipal service review on MBCSD was completed in October 2007 as part of an agency-specific study. This initial municipal service review provided a baseline evaluation of MBCSD and its entire service operations. The review concluded MBCSD appeared to be operating efficiently and in a fiscally sound manner with no significant infrastructure needs or deficiencies identified.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

MBCSD’s existing jurisdictional boundary is approximately 1.3 square miles in size and covers 834 unincorporated acres with almost two-thirds (525 acres) included in the Golden Gate National Recreational Area. Overall there are 187 legal parcels within MBCSD based on County Assessor’s Office records with a current combined assessed value of \$121.4 million. Ownership of these parcels is divided between 89% private/individual and 11% public/non-profit titleholders with the latter category accounting for nine-tenths (738) of all jurisdictional acres (including public right-of-way acreage). Total assessed value (land and structures) within MBCSD is set at \$121.4 million as of January 2015.

MBCSD’s jurisdictional boundary spans 1.3 square miles with a current total assessed value of \$121.4 million; the latter of which represents an estimated per capita assessed value of \$0.276 million.

As for key characteristics, the portion of the jurisdictional boundary under private ownership is nearly built-out with 146 of the 166 – or 88.0% - of the affected parcels already developed. This existing development, notably, includes 157 residential units.⁹⁸ Projected future development of the remaining privately owned and undeveloped lots within MBCSD is estimated by the Commission to include the future construction of 10 new residential units based on the County of Marin’s existing land use policies and zoning allowances and entirely tied to single-family structures.⁹⁹

MBCSD’s Jurisdictional Boundary Characteristics	
Table 4-46 (Marin LAFCO / MarinMap)	
Total Jurisdictional Acreage.....	834.5
Total Jurisdictional Parcels.....	187
- Number of Parcels Under Public or Non Profit Ownership / Total Acres.....	21 / 606.7
- Number of Parcels Under Private Ownership / Total Acres.....	166 / 95.8
- Total Number of Public Right-of-Way Acreage.....	132.0
- Percentage of Parcels Under Private Ownership Developed.....	88.5
- Percentage of Parcels Under Private Ownership Undeveloped.....	11.5
Total Number of Registered Voters.....	270
Total Assessed Value.....	\$121.422 m

⁹⁸ Two of the 157 residential units located within MBCSD are assigned to the San Francisco Zen Center – Green Gulch Farm and not presently served by the District’s potable water system.

⁹⁹ There are four additional vacant residential parcels of minimum building size located within MBCSD, but due to topography and other constraints do not appear buildable based on consultation with the District. The projection of 10 buildable new lots within MBCSD also matches the County of Marin’s Housing Element estimate.

Notes to Boundary Characteristics Table:

- 1) There are 14 parcels within MBCSD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

MBCSD’s jurisdictional boundary has been relatively unchanged with only two recorded boundary changes.¹⁰⁰ Both recorded changes involved annexations approved by the Commission in 1971 and collectively added approximately 35 acres of undeveloped land along the coastline to MBCSD.¹⁰¹ The annexations were expected to facilitate new residential and commercial development, but were soon thereafter purchased by the United States and subsequently added to the GGNRA. No subsequent boundary change proposals have been filed with the Commission to date.

3.3 Sphere of Influence

MBCSD’s sphere of influence was established by the Commission in 1984. The established sphere of influence was purposely set to match MBCSD’s entire 834.5 acre jurisdictional boundary. The Commission updated the sphere of influence in 2007 as a result of CKH to include one additional 0.6 acre lot comprising MBCSD’s well-site located in Frank Valley. The substantive result is the referenced 0.6 acre lot is the only non-jurisdictional land within MBCSD’s sphere of influence as of date.

MBCSD’s sphere is nearly coterminous with its jurisdictional boundary; i.e., this baseline suggests minimal expansion of the jurisdictional boundary is expected as of the last update in 2007.

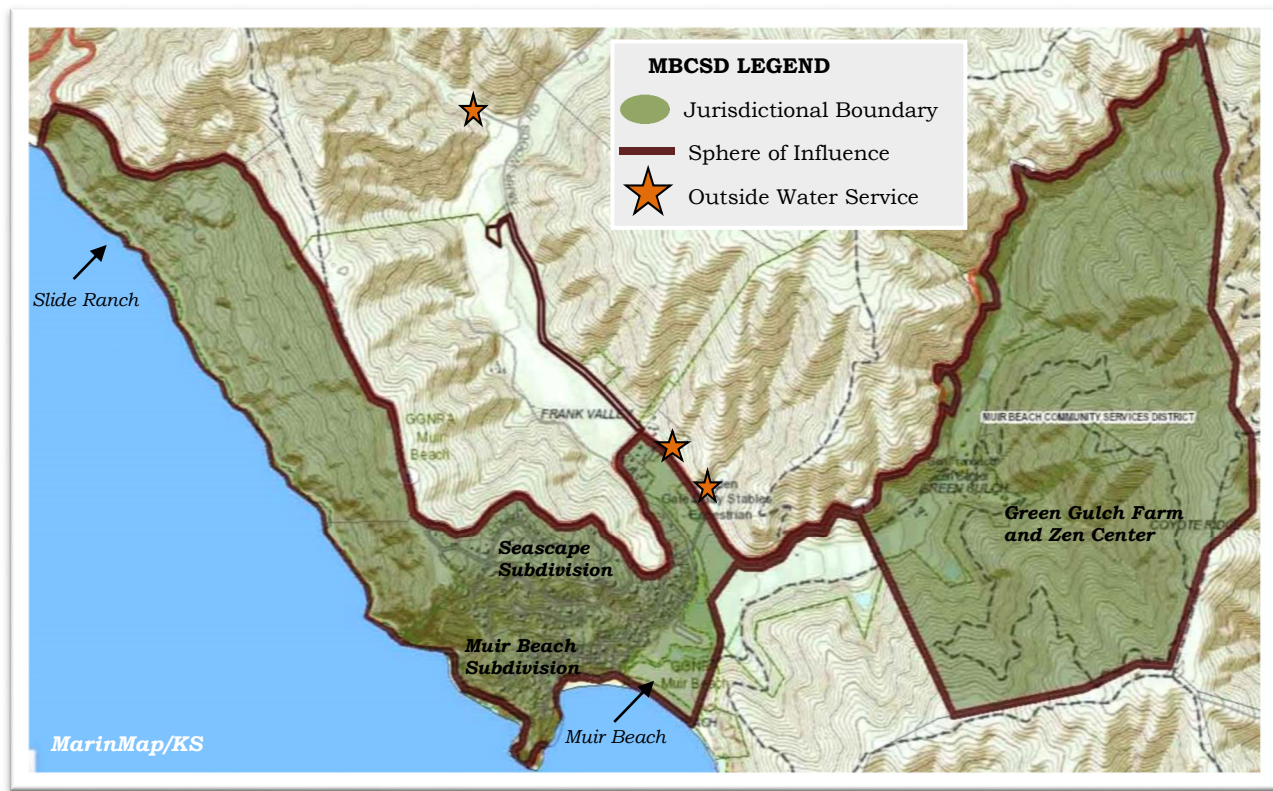
3.4 Outside Services

MBCSD currently reports the District provides water service to three lots lying outside its jurisdictional boundary. Service to all three affected lots – which also lie outside the sphere of influence – was established in the 1970s and before being subject to Commission approval with the 2001 enactment of G.C. Section 56133. Two of the three outside service connections serve GGNRA facilities (horse stables and ranger residences). The third lot serves the Mt. Tamalpais State Park’s Horse Camp.

MBCSD’s Active Outside Water Service Connections		
Table 4-47 (Marin LAFCO / MBCSD)		
Street Address	Assessor Number	Current Use
1760 Shoreline Highway	199-160-07	GGNRA’s Horse Stables
2000 Shoreline Highway	199-182-08	GGNRA’s Ranger Residences
N/A	199-070-18	Mt. Tamalpais State Park Horse Camp

¹⁰⁰ This statement reflects only the status of MBCSD’s jurisdictional boundary since LAFCOs were established in 1963.
¹⁰¹ Referenced boundary changes involved the “Stevenson” (71-33) and “Lopes” (71-53) annexations.

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

MBCSD’s current resident population within its jurisdictional boundary is estimated by the Commission at 431 as of the term of this study period.¹⁰² This estimate also indicates MBCSD is at 93.8% with respect to its meeting its projected buildout total of 459.¹⁰³ This current resident estimate is based on a modified calculation specific to public water systems and represents a total population growth rate of 2.0% over the preceding five year period or 0.43% annually; an amount that is nearly three times higher than the

LAFCO estimates there are 431 total residents within MBCSD that are explicitly served by the District’s potable water system as of term of this study period. This means MBCSD is at 94% of its resident buildout, and not expected to reach buildout until 2028.

¹⁰² California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid combining the second and third options is appropriate for purposes of this review and involves the number of MBCSD residential service connections – 154 - multiplied by 2.8 to produce 431.

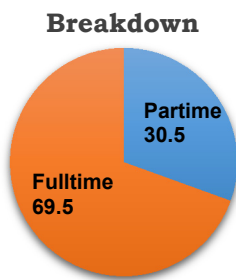
¹⁰³ The current buildout projection for MBCSD of 459 is drawn from identifying the number of new units – 10 – that could be accommodated within the District based on the current County of Marin Housing Element and multiplied by a factor of 2.8. Actual construction is subject to external factors and highlighted by market demand and permit approvals from the County.

annual rate for the entire county over the same period. This growth appears entirely attributed to the construction and occupancy of three new single-family residences since 2009. MBCSD’s estimated resident population equals approximately 1.7% of the countywide population.

With respect to projections going forward, and for purposes of this review, it is reasonable to assume the growth rate within MBCSD will match the study period with an overall yearly change of 0.40%. The substantive result of this assumption would be an overall increase in MBCSD’s resident population of 19 and total 448 by 2023. It also indicates – and if this growth rate were to hold thereafter – MBCSD will reach its estimated resident buildout of 459 in the year 2028. These collective projections – past, current, and future – are summarized below.

LAFCO Population Estimates for MBCSD				
Table 4-48 (Marin LAFCO)				
2009	2013	2018	2023	Annual Trend
422	431	440	450	0.43%

4.2 Residency Type



The Commission projects for the purposes of this review that MBCSD’s estimated residential total of 431 as of the term of the study period is divided between 243 fulltime and 188 part-time residences with the accompanying calculation footnoted.¹⁰⁴ This projection – which is premised on the assumption of limited rental properties in MBCSD – is based on a review of current County Assessor records and indicates 70% of the District’s residents are year-round. This projection also assumes MBCSD’s resident population increases by more than one-quarter during peak periods.

¹⁰⁴ This projection is based on taking the total number of units (151) assigned to all developed residential lots within MBCSD and developing a percentage of those associated units with local ownership addresses (69.5%) versus those with non-local mailing addresses (30.5%) and applied to the projected overall population of 431. The projection also does not take into account the potential for non-owner residents (renters) within MBCSD.

4.3 Social and Economic Indicators

A review of recent demographic information for the Muir Beach community indicates MBCSD serves a relatively older, homogeneous, and wealthier constituent base compared to countywide averages based on census data collected between 2005 and 2012. This census data also shows MBCSD’s residents, notably, have experienced a marked improvement in their social and economic standing. A summary of trends in pertinent demographic information for Muir Beach follows.

MBCSD’s fulltime constituents are generally more affluent, homogeneous, and formally educated compared to countywide averages despite similar ages. Further, the rate of the community’s affluence is escalating with the median household income having recently increased by two-thirds and now standing nearly double the countywide average.

MBCSD Resident Trends in Social and Economic Indicators				
Table 4-49 (Marin LAFCO / American Communities Survey)				
Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Avg.
Median Household Income	\$101,298	\$169,063	66.9%	\$90,962
Median Age	47.1	53.7	14.0%	44.6
Prime Working Age (25-64)	78.9 %	87.4%	10.7%	56.6%
Unemployment Rate (Labor Force)	0.0%	0.0%	0.0%	4.5%
Persons Living Below Poverty Rate	0.0%	0.0%	0.0%	7.5%
Mean Travel to Work	40.5 minutes	36.1 minutes	(10.9%)	28.4 minutes
Adults with Bachelor Degrees or Higher	77.3%	82.1%	6.2%	54.6%
Male	67.0%	61.3%	(8.5%)	49.2%
Female	33.0%	38.7%	17.3%	50.8%
White / Non-Hispanic	81.7%	94.2%	15.3%	73.1%
Hispanic	18.3%	3.7%	(69.1%)	15.3%
Other	0.0%	2.1%	n/a	11.6%

5.0 Organizational Structure

5.1 Governance

MBCSD’s governance authority is codified under the Community Services District Act of 2006 (“principal act”) and empowers the District to provide a full range of municipal services if authorized by LAFCO with the notable exception of direct land use control.¹⁰⁵ MBCSD – which is one of 317 CSDs operating currently in California – is presently authorized to provide four specific services within its jurisdictional boundary: a) potable water; (b) roads; (c) fire protection; and (d) recreation services. All other latent powers would need to be activated by the Commission before MBCSD would be allowed to initiate under Government Code Section 56824.10.

LAFCO approval is needed for MBCSD to activate a latent power or divest itself from an existing service.

¹⁰⁵ Senate Bill 135 (Kehoe) provided a comprehensive update to CSD law in 2006 and was the byproduct of a 19-member working group that included participation by CALAFCO.

A list comparing active and latent power authorities under the principal act follows.

Active Service Powers

- potable water services
- fire protection services
- road, bridge, curb, etc. services
- park and recreation services

Latent Service Powers

- police protection services
- street lighting services
- street landscaping services
- street cleaning services
- wastewater services
- reclamation services
- solid waste services
- vector control services
- animal control services
- broadband facility services
- television/radio facility services
- library services
- underground electric facilities
- underground communication facilities
- abate weeds and rubbish
- hydroelectric services
- security services
- cemetery services
- finance area planning commissions
- finance municipal advisory councils
- mailbox services

MBCSD has been governed since its formation in 1958 as an independent special district with registered voters comprising a five-member governing board.¹⁰⁶ Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating chair system and have voted to forgo receiving a meeting per diem. Contested seats have occurred in approximately half of the last 10 years of elections. The Board currently meets monthly on the fourth Thursday at 7:00 P.M. at the Community Center located at 19 Seacape Drive in Muir Beach.

A listing of Board members as of January 2015 along with respective backgrounds and continuous years served follows.

MBCSD Board Roster			
Table 4-50 (MBCSD)			
Member	Position	Background	Years on Board
Steve Shaffer	Chair	real estate investments	28
Scott Bender	Vice Chair	management consultant	5
Gerry Pearlman	Member	non-profit	1
Peter Lambert	Member	finance	3
Paul Jeschke	Member	news journalist	1
Average Years of Board Experience			7.6

¹⁰⁶ Provisions exist within the principal act to make a CSD a dependent entity and governed by the County Board of Supervisors if certain conditions apply.

5.2 Administration

MBCSD appoints an at-will General Manager to oversee all District activities. The General Manager – Leighton Hills – was appointed by the Board in 2005 and is presently budgeted for 40 hours per week and generally works out of a private workspace in Mill Valley.¹⁰⁷ The General Manager oversees two part-time employees that include a water manager and general maintenance assistance.

MBCSD Community Center



MBCSD also contracts with a private accountant to provide billing and prepare financial statements. Legal services are also provided by contract with County Counsel.

MBCSD Administration

Table 4-51 (MBCSD)

General Manager.....	Leighton Hills
Legal Counsel.....	County Counsel
Water System Operator.....	Harvey Pearlman

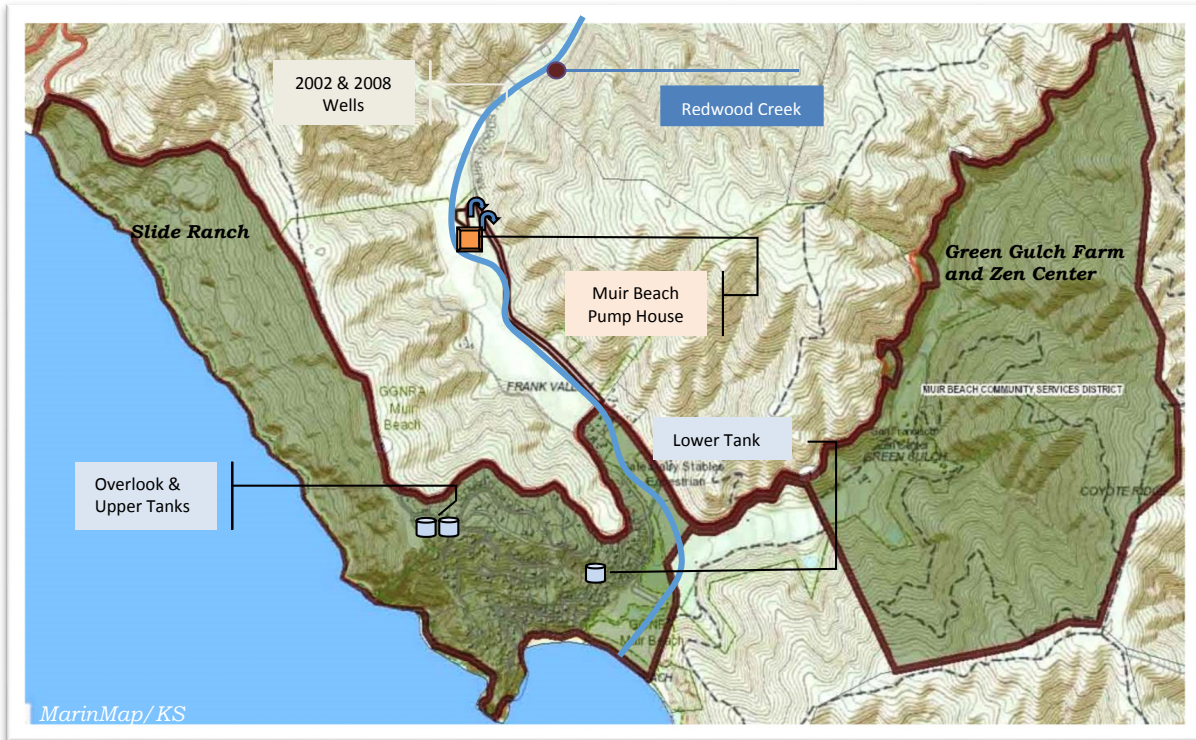
6.0 Potable Water Services

6.1 Service Overview

MBCSD directly provides retail potable water services through its own supply, treatment, storage, and distribution facilities. These facilities were originally constructed and operated by two separate mutual water companies and later purchased and expanded by MBCSD. The first private water provider was the Muir Beach Mutual Water Company and it was created in the 1920s to serve the Muir Beach Subdivision and surrounding area before being purchased by MBCSD at the time of District formation in 1958. The Seacape Mutual Water Company was created in the 1960s to serve the Seacape Subdivision and surrounding area before being annexed and purchased by MBCSD in 1970 at the request of landowners. The distribution system currently spans approximately 2.5 miles with approximately 4,000 feet to be replaced in 2015. The balance of the distribution system is reported by MBCSD to be in generally good condition and does not require immediate replacement or upgrade. The water system itself spans close to one-third of MBCSD’s jurisdictional boundary with the notable absence of excluding the Green Gulch Farm and Zen Center and Slide Ranch.

An overview of MBCSD’s water system in terms of key infrastructure is shown below.

¹⁰⁷ Leighton Hills served as Deputy General Manager for MBCSD between July 2007 and January 2010 while Maury Ostroff served as General Manager.



6.2 Supplies

MBCSD’s potable water supplies are all locally sourced and drawn from two separate groundwater sites that lie within the approximate 8.8 square mile Redwood Creek watershed.¹⁰⁸ These sources coupled with pumping capacities collectively provide MBCSD with access to an estimated available annual supply of 209.7 acre-feet, but reduced to a *maximum* annual yield of 50.60 acre feet based on current permit allowances (emphasis). A more detailed summary of MBCSD’s water sources follows.

MBCSD’s maximum annual potable water yield is estimated at 50.6 acre-feet based on applicable flow, pump, and current permit capacities.

Primary Source

MBCSD’s primary potable water source is a groundwater well lying on District owned land in Frank Valley that is otherwise dedicated as a public picnic area. This “2002 well” – which is drilled to a depth of 60 feet and powered by a submersible pump – draws down on underflow from the Redwood Creek; a tributary to the Pacific Ocean. The 2002 well’s right to access underflow from Redwood

MBCSD’s potable water supply is entirely drawn from underflow of the Redwood Creek with a permitted daily and annual take of up to 0.14 and 50.60 acre-feet,

¹⁰⁸ The Redwood Creek watershed size calculated by County of Marin via MarinMap.

Creek is secured through a post-1914 appropriative permit from the State Water Resources Control Board.¹⁰⁹ The permit allows MBCSD daily and annual maximum yields of 0.14 and 50.60 acre-feet, respectively. The rated capacity of the pump affixed to the 2002 well is 60 gallons per minute and translates to a potential maximum daily yield of 86,400 gallons or 0.27 acre-feet; a stand-alone amount that exceeds the daily 45,000 gallon permit threshold by nearly double.¹¹⁰

A second well – termed “2008 well” – is also utilized as a backup by MBCSD in Frank Valley to draw underflow from the Redwood Creek. The 2008 well is located within 100 feet of the 2002 well and also drilled to approximately 60 feet in depth. The 2008 well is used when the 2002 well is shut down for maintenance or repair. The rated capacity of the pump affixed to the 2008 well is 40 gallons per minute and translates to a potential maximum daily yield of 57,600 gallons or 0.18 acre-feet; a stand-alone amount that exceeds the daily 45,000 gallon permit threshold by over one-fourth.

MBCSD’s pump capacities allow the District to access 100% of its permitted daily use.

MBCSD’s plumbing and control systems preclude operation of both the 2002 and 2008 wells at the same time.

Secondary Source(s)

MBCSD does not have a supplemental or secondary potable source beyond its permitted use of underflow from Redwood Creek. There are also no viable alternatives available to MBCSD other than trucking in water from willing sellers.

Supply Average

MBCSD’s average yield or take over the study period from the District’s permitted right to underflow from the Redwood Creek has been 8.629 million gallons or 26.48 acre-feet. The single-highest year-end use of this underflow source over the study period occurred in 2012 and MBCSD drew 9.408 million gallons or 28.87 acre-feet; an amount that exceeded the average annual take by close to one-tenth.

MBCSD’s average annual potable water yield over the last five years from Redwood Creek underflow has been 26.48 acre-feet.

¹⁰⁹ MBCSD’s permit with the State Water Resources Control Board was originally issued in 1988 and marked an important transition in the way the Board viewed the underlying water source from groundwater to underflow.

¹¹⁰ MBCSD reports the 2002 well’s actual capacity in-and-of-itself is 90 gallons per minute.

Supply Reliability

Like other public water service providers in West Marin the reliability of MBCSD’s potable water supply is relatively safe from external restrictions given it is entirely locally sourced. MBCSD also benefits from its underflow source lying within a relatively secure watershed that is federally protected from future intense development activities given its inclusion within the Golden Gate National Recreational Area.¹¹¹ The lone – albeit significant – constraint on MBCSD’s water supply is climate change effecting runoff needed to charge Redwood Creek as well as salinity intrusion.

LAFCO projects MBCSD’s annual potable water supplies declining by 38% to 31.4 acre-feet during significant droughts based on 1976-1977 conditions.

No formal analysis has been performed by MBCSD in recent years with respect to quantifying the District’s water supply reliability during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to MBCSD. With this in mind, the Commission projects MBCSD’s water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought.¹¹² The substantive effect of applying this drought projection is MBCSD’s annual water supply being reduced from its normal/maximum level of 50.60 acre feet to 31.4 acre-feet.

The following table summarizes MBCSD’s water supply sources relative to right/permit allowance, normal year conditions, and drought year conditions.

MBCSD’s Potable Water Supply Availability with LAFCO Projections						
Listed in Acre-Feet Table 4-52 (Marin LAFCO / MBCSD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To MBCSD	Convey Year Max To MBCSD	76-77 Drought Day Max To MBCSD	76-77 Drought Year Max To MBCSD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
Redwood Creek (21085)	0.14	50.60	0.14	50.60	0.037	31.4
Total Yield	0.14	50.60	0.14	50.60	0.037	31.4

LAFCO Calculation
To Parallel 1976-77
Drought Conditions

¹¹¹ The only other well upstream of MBCSD’s wells serve three small residences for park rangers on State property.
¹¹² State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 74% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale MBCSD’s supplies are permitted and already incorporate a baseline reduction in total flows in Redwood Creek.

Notes to Water Supply Table:

- 1) MBCSD’s license for diversions from Redwood Creek is a post-1914 appropriate right and accessed through two groundwater sites: Wells No. 2002 and 2008.
- 2) Both the 2002 and 2008 wells operate under the same permit from the State Water Resources Control Board with respect to drawing underflow from Redwood Creek. The permit provides a maximum daily and annual allowance of 0.14 and 50.60 acre-feet, respectively.
- 3) MBCSD’s combined pump capacities at the 2002 and 2008 wells (130 gallons per minute) would allow the District to draw up to 209.7 acre-feet annually if allowed by the State Water Resources Control Board.
- 4) Drought year conditions reflect a 38% reduction in water supplies compared to normal/max conditions for MBCSD’s permitted right to underflow from Redwood Creek, and is based on a modified version of the Department of Water Resources’ calculation for surface supply curtailment for conditions similar to the 1976-77 drought as detailed.

6.3 Treatment Facilities

MBCSD provides chlorine disinfectant treatment of the raw water extracted from either of its two well sites in Frank Valley through metered injection of liquid chlorine into its water main at a point housed in a small service building referred to as the “Muir Beach Pump House.”¹¹³

MBCSD treats all raw water collected from its two well sites at the District’s Muir Beach Pump House. This facility has a treatment capacity of 100 gallons a minute, and if run continuously, results in a daily maximum total of 144,000 gallons or 0.44 acre feet.

MBCSD recently supplemented its chemical treatment process to now inject soluble silica at the wellhead, and prior to injection of chlorine, to militate against the effects of copper plumbing in residents’ homes. The well pumps and treatment processes run nightly to replace daytime usage based on storage levels with MBCSD’s initial pressure zone serving Seacape. The daily treatment capacity at the Muir Beach Pump House when both wells are in use is 100 gallons a minute and *if* run continuously results in a daily maximum total of 144,000 gallons or 0.44 acre-feet (emphasis). This daily capacity exceeds the daily accessible yield available to MBCSD of 0.14 acre-feet. It also accommodates MBCSD’s current peak-day demand of 0.12 acre-feet.

MBCSD’s Water Treatment Facility		
Table 4-53 (MBCSD)		
Water Source	Primary Chemicals	Daily Treatment Capacity
Redwood Creek Underflow	Sodium Hypochlorite (Chlorine) Silica (Sand)	144,000 gallons / 0.44 acre-feet
Total		144,000 gallons / 0.44 acre-feet

¹¹³ The chlorine agent used by MBCSD is sodium hypochlorite.

6.4 Water Quality

MBCSD’s most recent water quality report for the study period was issued in June 2013 and covers sample testing for 2012. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the California Department of Public Health (DPH); the former addressing public health and the latter addressing taste and appearance. No excessive primary contaminants were found. A limited number of excessive secondary contaminants were found and involved high readings for manganese and turbidity. No actions were required by DPH.

MBCSD’s last water quality report during the study period shows no excessive primary contaminants and required no actions by DHS.

6.5 Distribution System and Storage Facilities

MBCSD’s potable distribution system consists of approximately 2.5 miles of mains and overlays two connected pressures zones termed “upper” and “lower” that jointly cover a 500 foot range in elevation between service connections. The distribution system was originally built in the 1960s and relies on gravity pressure for recharge from three MBCSD storage tanks that collectively hold 450,000 gallons or 1.38 acre-feet; the latter amount equaling 18 times the average day demand.¹¹⁴ Water is pumped nightly from MBCSD’s well site through treatment and into the system to restore supplies from the previous day. There are no public pump stations connected to the distribution system. There are four residences located near the top of the water system with private pressure booster systems.

MBCSD’s potable storage capacity within the distribution system totals 1.38 acre-feet and can accommodate up to 11.9 days of average peak-day demand totals over the study period.

As referenced, each night MBCSD pumps water from its well site lying at 40 feet above sea level and through treatment and through a 5,500 foot cast-iron main into the “Lower Zone” and its 100,000 gallon or 0.31 acre-feet storage tank lying at 260 feet above sea level. This initial pressure zone provides gravity water pressure to approximately one-half of MBCSD’s service connections lying within the Muir Beach Subdivision and surrounding lands at an estimated 94 psi.¹¹⁵ A booster station also nightly pumps water from the Lower Tank to the upper pressure zone and its two storage tanks – “Upper and Outlook Tanks” – that lie at 477 feet above sea level and collectively hold 350,000 gallons or 1.07 acre-feet. The upper zone serves the remaining one-half of MBCSD connections in the Seacape Subdivision through gravity at an estimated 95 psi. Water from the upper zone can also serve the lower zone through three pressure reducing stations.

¹¹⁴ There are currently 40 fire hydrants connected to the distribution system.

¹¹⁵ The distribution mains in the lower zone consist of high-density polyethylene and polyvinyl chloride and have replaced all of MBCSD’s historic galvanized steel plumbing.

MBCSD's Potable Storage Tanks			
Table 4-54 (Marin LAFCO / MBCSD)			
Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Upper Zone	49.7	Seacape Subdivision	350,000 gallons / 1.07 acre-feet
Lower Zone	50.3	Muir Beach Subdivision	100,000 gallons / 0.31 acre-feet
		Total:	450,000 gallons / 1.38 acre-feet

6.6 Service Connections

MBCSD serves 159 active potable water service connections as of the term of the study period and divided between 154 residential and five non-residential customers; the latter of which include one commercial use at Pelican Inn and four public uses highlighted by the horse stables on GGNRA property and a horse camp on State Parks property.¹¹⁶ Connections have been relatively stagnant over the study period and have increased by only three or 1.9% and all involve new residential hook-ups. Three of MBCSD's current water connections lie outside the District's jurisdictional boundary and are documented in Section 3.4 of this agency profile.

Trends in MBCSD's Potable Water Connections						
Table 4-55 (MBCSD)						
Category	2009	2010	2011	2012	2013	5-Year Change
Non Residential	5	5	5	5	5	0.0%
Residential	151	153	153	153	154	2.0%
	156	158	158	158	159	1.9%

6.7 System Demands

MBCSD's average annual potable water demand production over the **study period** has been 8.268 million gallons or 25.37 acre-feet. The most recent completed year showed total demand at 8.777 million gallons or 26.93 acre-feet (see footnote 37). This most recent amount represents an average daily water demand for the entire system of 24,048 gallons or 0.074 acre-feet; an amount that is further broken down to 151 gallons per day for every service connection.¹¹⁷ Per capita use has similarly increased relative to per connections with a study period average of 53 gallons. The peak-day demand – the highest one day sum for the

MBCSD's average annual water demand over the study period has been 25 acre-feet and translates to 144 gallons per day for ever active connection. The average daily water demand per resident during this period is 53 gallons. Overall water demands during this period have increased by 8.8%; an amount – notably – that is four times greater than the estimated population change in the District.

¹¹⁶ GGNRA also has a water connection at the beach at Muir Beach, but it is currently inactive.

¹¹⁷ MBCSD reads consumer water meters bimonthly and as such daily demand is approximated by the daily pumping records maintained by the District. Due to pump failure, maintenance, or repairs to water mains, all of which occur throughout the year, the system relies upon existing storage for a number of days until repairs or maintenance are finished. Hence, and according to MBCSD, the subsequent pumping may cause the pumping volumes to depart significantly from the actual daily demand.

affected year – totaled 0.122 acre-feet and was nearly two-thirds greater than annualized daily average and results in a peaking factor of 1.66.¹¹⁸

With respect to trends, MBCSD has experienced an overall increase of 8.8% in potable water demands over the study period or 1.76% annually. (Individual changes in year-to-year demand ranged from an increase of 5.0% to a decrease of (3.2%). This overall increase in water demands, notably, outpaces the change in population over the same time period by four-fold. This increase in usage appears largely attributed to the intensification of uses among existing development and supplemented to a degree by new growth and distortions between customer usage and pumping records resulting in catch-up pumping as described in footnote tied to the preceding paragraph. Changes in peak-day demands have also increased over the last five year period from 0.09 to 0.12 acre-feet or 24.5%.

Study Period Trends in MBCSD’s Potable Water Demands							
Table 4-56 (Marin LAFCO / MBCSD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	24.76	25.15	24.36	25.65	26.93	25.37	8.8%
Average Day	0.068	0.069	0.067	0.070	0.074	0.0696	8.8%
Connections	156	158	158	158	159	158	1.9%
Per Day Connection	142g	142g	138g	145g	151g	144 gallons	6.3%
Per Day Resident	52g	52g	51g	54g	56g	53 gallons	7.7%
Peak Day	0.098	0.126	0.127	0.106	0.122	0.116	24.5%
Peaking Factor	1.44p	1.83p	1.90p	1.51p	1.66p	1.67 peaking	15.3%

Year Amounts Shown in Acre Feet Unless Stated Otherwise

Going forward – and specifically for purposes of this study – it appears reasonable to assume MBCSD’s water demands will generally follow trends over the study period. It is estimated, accordingly and using linear regression to control for variances in the most recent year-end totals, the system will experience an overall increase in water demand of 2.6 acre-feet over the next 10 years to 2023; a difference of 9.7% or 0.97% annually. It is also estimated the system’s peak-day demands will remain flat and trend consistent with recent amounts and the current five-year average peaking factor of 1.67 – which incorporates recent variances as is – will hold through 2023.¹¹⁹ The following table summarizes these projections over the next 10 years.

LAFCO independently projects MBCSD’s annual water demands will increase by 2.6 acre-feet or 9.7% by 2023; an intensity increase of nearly one-tenth relative to the study period and will result in daily usage rising to 59 gallons per resident by 2023.

¹¹⁸ The peaking factor varied over the five year period from 1.45 to 1.90.

¹¹⁹ MBCSD reports it has an ability to achieve significant reductions in overall system demand through conservation regulation and through being able to directly contact the small number of large users in the District. MBCSD also notes almost all high usage in the District is attributable to landscape irrigation and is largely optional in the relatively cool coastal environment.

LAFCO Projected Trends in MBCSD’s Potable Water Demands							
Table 4-57 (Marin LAFCO)							
Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	26.93	26.64	27.80	28.38	28.96	29.54	9.7%
Average Day	0.074	0.073	0.076	0.078	0.079	0.081	9.5%
Peak Day	0.122	0.122	0.127	0.130	0.132	0.135	10.7%
Connections	159	160	162	163	164	165	3.6%
Per Day Connection	151g	149g	153g	156g	157g	160g	6.0%
Residents	431	435	438	442	446	450	4.4%
Per Day Resident	56g	55g	56g	58g	58g	59g	5.1%

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Notes to LAFCO Projected Trends in Water Demands:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2009 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 1.67 ratio over average day demands.

6.8 Infrastructure Capacities to Demands

MBCSD’s water infrastructure is currently operating with available capacity in supply, storage, and treatment relative to existing demands generated during the study period under both normal and non-peak conditions. The water system is projected to be under stress, though, in drought-year conditions with current annual demands approaching – but not exceeding - available supply capacities as identified by the Commission. This stress, however, is amplified with current peak-day demands reaching capacity under normal conditions and surpassing capacity during drought conditions with the latter exceeding by more than double as well as intensifying going forward through 2023. These factors emphasize the importance for MBCSD to continue to perfect ongoing conservation efforts to help reduce demands during typical high-use periods given alternatives in increasing supplies do not appear readily available to the District.

The following statements summarize and quantify existing and projected relationships between MBCSD’s capacities and demands now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Water Supply:

- Average annual water production demands generated over the study period represent 56% of MBCSD’s projected accessible sources under normal conditions. This ratio is expected to rise to 58% by 2023.

Annual Ratios

Annual Ratios

- Average annual water production demands generated over the study period represent 86% of MBCSD’s projected accessible sources under projected single dry-year conditions. This ratio is expected to rise to near capacity at 94% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 83% of the new daily supply available to MBCSD under normal conditions. This ratio is expected to rise to near capacity at 96% by 2023.
- Average peak-day water production demands over the study period represent 314% of the new daily supply available to MBCSD under projected single dry-year conditions – or a deficit of (214%). This ratio is expected to rise to a deficit of (265%) by 2023.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 26% of MBCSD’s existing potable treatment capacity. This ratio is expected to rise to 31% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 8% of MBCSD’s existing potable storage capacity. This ratio is expected to rise to 10% by 2023.
- All two pressure zones within MBCSD’s system have adequate dedicated potable storage in meeting their proportional share of the District’s current-peak day demands. No substantive change in these ratios is projected going forward through 2023.
- MBCSD’s surplus potable storage capacity is critical to allow the District to mitigate its existing and projected supply deficits during peak demand usage in single dry-year drought conditions. The existing storage capacity, notably, allows MBCSD to accommodate 11.9 consecutive days of current peak day demands. This capacity is projected to decrease to 10.2 days by 2023.

Water Conservation / Mitigation:

- MBCSD declared a water shortage emergency in August 2014 to prohibit general water waste as well as prescribe certain use requirements therein, including limiting landscape irrigation to no more than twice a week and only on Wednesday and Friday nights.

- MBCSD reports the water system was successfully stress-tested during the 1976-1977 drought as supplies were sufficient in meeting constituent demands. This prior stress-test suggests – albeit in the absence of 40 years of subsequent environmental changes and demand increases - the water supply may be more resilient and outperform the projections in this study in drought conditions.

A summary table assessing supply, storage, and treatment capacities relative to current and projected demands to 2023 is provided below.

MBCSD’s Capacity Relative to <u>Current</u> Average Demands			
Table 4-58 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply			
.. Normal Conditions	✓		
.. Single Dr-Year Conditions			✓
Water Storage	✓		
Water Treatment	✓		

MBCSD’s Capacity Relative to <u>Projected</u> Demands by 2023			
Table 4-59 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply			
.. Normal Conditions	✓		
..Single Dry-Year Conditions			✓
Water Storage	✓		
Water Treatment	✓		

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

MBCSD relies on two distinct charges and fees to fund the District’s water system in terms of operating and improvements: (a) bi-monthly user charge and (b) semi-annual fee for water capital improvements. The user charge is set by Board ordinance and is intended to provide full cost-recovery for the daily operation of the water system and contribute 25% towards capital improvements. The user charge was last updated by the Board in January 2013 and is in tier format to apply an escalating rate based on consumption over the 60-day billing period. The user charge, which applies evenly to inside and outside customers, currently results in the average customer paying \$92.24

The average residential customer in MBCSD is paying \$553.44 annually in direct water charges based on a daily use of 151 gallons. This produces an approximate ratio of \$1.00 for every 100 gallons.

for every two-month billing cycle based on a proportional allocation of daily demands. The semi-annual capital improvement fee collects \$300 and \$3,250 each year on the assessment roll for all residential and non-residential connections, respectively, and used only for capital improvements to the water system. The cumulative cost for most customers is \$533 annually and results in a per 100 gallon equivalent charge of \$1.00 based on rates as of January 2015 and average uses generated during the study period.

MBCSD also collects a connection fee for new customers. The connection fee for a typical single-family residential structure is set at \$6,500.

7.0 Agency Finances

7.1 Financial Statements

MBCSD prepares financial statements for each fiscal year utilizing the services of a bookkeeper who is also a certified public accountant. The financial statements are done at the end of the fiscal year on an accrual accounting basis and identify MBCSD’s total assets, liabilities, and equity. These statements – although unaudited since 2006-2007 – provide quantitative measurements in assessing MBCSD’s short and long-term fiscal health.

2012-2013 Financial Statements	
Assets	\$2.634 m
Liabilities	\$0.023 m
Equity	\$2.611 m

MBCSD’s most recent financial statements for the study period were issued for 2012-2013 and shows the District experienced a positive and significant change to its fiscal standing as its overall equity or fund balance increased by over one-half from \$1.658 to \$2.611. This increase in the overall fund balance is directly tied to growing balances in MBCSD’s water capital improvement fund (restricted fund balance) that is currently targeted to self-fund a major water line replacement project in 2015. A summary of year-end totals and corresponding trends in assets, liabilities, and equity this period are shown in the following tables.

Agency Assets

MBCSD’s unaudited assets at the end of 2012-2013 totaled \$2.634 million and have increased by over one-half due to ongoing operating surpluses and allocation of revenues for water capital improvements. Assets classified as current with the expectation they could be liquidated within a year represented close to one-third of the total amount with the majority tied to cash in savings accounts. Assets classified as non-current represented the remaining two-thirds with the largest portion associated with buildings and lands and includes the recent construction of new water storage tanks.

MBCSD Assets | Study Period
Table 4-60 (Marin LAFCO / MBCSD)

MBCSD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Assets	1.034	0.640	0.475	0.728	0.864	(16.4)
Non-Current Assets	0.651	1.319	1.583	1.733	1.770	171.9
	\$1.686	\$1.959	\$2.059	\$2.461	\$2.634	56.2%

amounts in millions

Agency Liabilities

MBCSD’s unaudited liabilities at the end of 2012-2013 totaled \$0.023 million and have stayed relatively stagnant over the preceding five-year period. Current liabilities representing obligations owed within a year accounted for the entire amount and primarily tied to holding security deposits on new water service accounts. MBCSD reported no non-current liabilities (i.e., loans or notes payable) at the end of the fiscal year.

MBCSD Liabilities | Study Period
Table 4-61 (Marin LAFCO / MBCSD)

MBCSD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Liabilities	0.027	0.125	0.018	0.029	0.023	15.0
Non-Current Liabilities	0.0	0.0	0.0	0.0	0.0	0.0
	\$0.027	\$0.125	\$0.018	\$0.029	\$0.023	15.0%

amounts in millions

Agency Equity / Net Assets

MBCSD’s unaudited equity / net assets at the end of 2012-2013 totaled \$2.611 million and represent the difference between the District’s total assets and total liabilities. This amount has increased by over one-half over the five previous fiscal years and primarily attributed to collection of funds – including nearly \$0.350 in private donations – for water capital improvements. The end of year equity amount incorporates a \$0.759 balance in unrestricted funds.

MBCSD’s unrestricted fund balance total of \$0.759 million equates to a per capita amount of \$1,761 as of the term of the study period.

MBCSD Equity | Study Period
Table 4-62 (Marin LAFCO / MBCSD)

MBCSD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Unrestricted	0.944	0.532	0.394	0.636	0.759	(20.0)
Restricted / Capital	0.714	1.302	1.646	1.796	1.851	159.2
	\$1.658	\$1.834	\$2.040	\$2.432	\$2.611	57.8%

amounts in millions

7.2 Liquidity, Capital, and Margin

A review of the financial statement issuances by MBCSD during the study period covering fiscal years 2008-2009 through 2012-2013 shows the District has generally maintained and/or improved its liquidity, capital, and margin levels. The most recent fiscal year shows MBCSD has maintained exceptionally high liquidity and capital to cover all short-term obligations more than 37 times over as well as avoiding the incurrence of any long-term debt. MBCSD reports the high liquidity levels are tied to growing balances in the capital fund balance and primed to self-fund a major water line replacement in 2015. MBCSD has also markedly improved its profitability by more than doubling its year-end net with most of the last five reported achieving an operating margin of nearly 50%. A summary of year-end liquidity, capital, and operating margin ratios through the study period are shown in the following table.

Study Period Trends in MBCSD Liquidity, Capital, and Margin			
Table 4-63 (Marin LAFCO / MBCSD)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	38.29 to 1	0.0%	20.8%
2009-2010	5.12 to 1	0.0%	41.9%
2010-2011	26.38 to 1	0.0%	34.3%
2011-2012	25.10 to 1	0.0%	45.2%
2012-2013	37.56 to 1	0.0%	48.9%
Averages	26.49 to 1	0.0%	38.2%
5-Year Trend	(0.02%)	0.0%	135%

7.3 Pension Obligations

MBCSD does not have any past or present employee pension obligations. All past and current workers have either been provided a defined contribution towards a private retirement account or served as an independent contractor with no pension benefits.

7.4 Revenue and Expense Trends

MBCSD has maintained positive revenue to expense differences in each of the five fiscal years covered in the financial statements issued for 2008-2009 to 2012-2013. Average year-end revenues over this period have totaled \$0.441 million with nearly two thirds of this amount drawn from property taxes (31%) and water service charges/fees (32%). Average year-end expenses over the same period have totaled \$0.202 million and were led by staffing related expenses (37%). Both revenue and expense totals

MBCSD has experienced revenue surpluses in each year of the study period. MBCSD has also experienced decreases in both ledgers during this period with revenues outperforming expenses by more than one-tenth.

over the five year period have been relatively dynamic as individual account categories have experienced notable movement from one year to the next and resulting in both ledger sides decreasing by nearly one-third. A key factor underlying this movement involves the receipt and application of annual donations by MBCSD.

A summary of the five-year averages within both revenue and expense ledgers follows.

Recent Trends in MBCSD Revenues | Study Period

Table 4-64 (Marin LAFCO / MBCSD)

Category	Five Year Average (2008-09 to 2012-13)	Portion of Total	Five Year Trend (2008-09 to 2012-13)
Property Taxes	136,914	31.0	13.0%
Water Charges/Fees	140,196	31.8	9.5%
Recreation Charges/Fees	13,079	2.7	(33.5)%
Fire Assessment	32,444	7.6	(12.5)%
Donations/Grants	122,807	25.6	(95.7)%
Other	6,081	1.9	(72.5)%
	\$441,523	100%	(30.4)%

Recent Trends in MBCSD Expenses | Study Period

Table 4-65 (Marin LAFCO / MBCSD)

Category	Five Year Average (2008-09 to 2012-13)	Portion of Total	Five Year Trend (2008-09 to 2012-13)
Staff / Payroll	75,300	37.2	(10.0)%
Insurance	8,846	4.8	(38.7)%
Health Insurance	11,602	5.7	(15.1)%
Water Operations	23,734	11.7	(14.7)%
Fire Operations	5,559	2.8	100.0%
Recreation Operations	3,334	1.7	51.9%
Accounting	25,050	12.4	(47.0)%
Utilities	11,554	5.7	2.9%
Other	37,539	18.5	(76.1)%
	\$202,518	100%	(34.2)%

D. STINSON BEACH COUNTY WATER DISTRICT

1.0 Overview

The Stinson Beach County Water District (SBCWD) was formed in 1962 and encompasses an approximate 10.0 square mile jurisdictional boundary along Marin County’s western shoreline. Governance is provided by a five-person board with members directly elected by registered voters and serve staggered four year terms. Access to SBWCD’s jurisdictional



Stinson Beach

boundary is primarily tied to the Pacific Coast Highway (1). The community is approximately 11 miles from the nearest incorporated community, Mill Valley, and lies within the Bolinas-Stinson Beach Elementary and Tamalpais Union High School Districts with the latter assigning students absent of transfer to Tamalpais High.

SBCWD is organized as a multi-purpose agency and provides three distinct services: (a) potable water; (b) onsite wastewater management; and (c) solid waste. Existing development within SBCWD is limited to approximately one-fifth of the District’s jurisdictional boundary and anchored by a series of contiguous residential subdivisions highlighted by Seadrift and Highlands. A mix commercial/residential district known as “Old Town” lies along a portion of State Highway 1, which is used as the main arterial for the community. The rest

Formation Date	1962
Enabling Legislation	Water Code Section 30000 et. seq.
Service Categories	Potable Water Solid Waste Onsite Wastewater Mgt.
Service Population	1,957
Registered Voters	451
Current Buildout Population Estimate	2,125

SBCWD’s jurisdictional boundary – approximate four-fifths of the total area – is undeveloped with minimal improvements and part of the Mount Tamalpais State Park and the Golden Gate National Recreational Area. All potable water supplies are locally drawn from creeks and groundwater sites with Stinson Gulch Creek serving as SBCWD’s primary source. The average annual water demand for SBCWD over the study period has been 53.7 million gallons or 164.8 acre-feet and represents a daily capita use of 75 gallons.¹²⁰

¹²⁰ This amount is drawn from total water production between 2010 and 2013 and calculated using the Commission’s own resident population projections for SBCWD.

SBCWD’s service area – collectively referenced to as “Stinson Beach” – is one of 20 formally defined unincorporated communities in Marin County. The current estimated resident total within SBCWD counting both fulltime (608) and part-time (1,359) is estimated by the Commission at 1,957 as of the term of this study period; an amount that represents an increase of 0.7% over the preceding five years and closely aligns with the countywide growth rate average of 0.6% over the same period. The projected buildout population as calculated by the Commission and based on current planning policies of the land use authority (County of Marin) within SBCWD is estimated at 2,125.¹²¹ Registered voters within SBCWD currently total 451 and represents 23.0% of the current estimated population. The adopted operating budget as of the term of the study period was \$1.646 million with funding for the equivalent of 8.0 employees. The unrestricted fund balance was \$1.330 million and sufficient to cover over 10 months of general operating expenses based on the 2013-2014 budget.

2.0 Background

2.1 Community Development

Stinson Beach’s present-day service area began developing in 1840s in step with the inclusion of the territory in an approximate 9,000-acre land grant – “Ranchos Baulines” – from Mexico to Gregorio Briones.¹²² The area’s initial development, and in contrast to neighboring Bolinas, did not include much residential use and instead was tied mostly to cattle, orchard, and dairy farming given access was limited to the water due to the surrounding mountains and coastal cliffs. It was not until the 1870s when access by land was established with a seasonal dirt road along the coast connecting from Sausalito and later becoming part of the Pacific Coast Highway (1).



¹²¹ Current and projected service populations are detailed in Section 4.1.

¹²² Background information is principally drawn from prior LAFCO reports and substantively supplemented from Imagine of America’s *Bolinas and Stinson Beach* (Bolinas Museum and the Stinson Beach Historical Society).

Nature enthusiasts began visiting the area by the 1880s with the development of the Dipsea Trail connecting the shoreline with Mill Valley through Mount Tamalpais and led prominent landowners – and in particular Nathan Stinson – to begin opening commercial establishments to cater to tourists. Tent-hotels on the beaches were the first to accommodate tourists and highlighted by the first publicized namesake for the area, Willows Camp. The continued popularity of the area with tourists persisted and led to the establishment of the Dipsea Inn in 1905 and the submittal of the first commercial/residential subdivision making up present-day Old Town one year later catering to seasonal residents on land owned by Nathan Stinson; all of which resulted in a new name for the shoreline community, Stinson Beach.

The development of Stinson Beach continued into the 1900s to emphasize seasonal residential uses and produced a sequence of phased subdivisions consisting of small cottage lots in the Calles area beginning in the 1910s. Individual septic systems were installed and ultimately two private-for-profit water companies drawing from separate local resources were formed to serve the Stinson Beach community. The first private utility was the Stinson Water Company and followed by the Goflito Water Company; each of which served different subdivisions and established diversion rights to local creeks. The area's popularity with tourists increased in 1928 when the State assumed and expanded operations at Mount Tamalpais. A school and post office were constructed by the 1920s and the Stinson Beach Fire Protection District was established in 1939.

By the 1940s, and consistent with the west-end region, development patterns and uses within Stinson Beach began to transition to accommodate more permanent residences as the lure of affordable housing for wartime operations coupled with earlier openings of the Panoramic Highway and Golden Gate Bridge made the community more accessible. The substantive result of this land-use transition was the approval and development of the Highlands and Seadrift Subdivisions by the end of the 1950s. More development was also anticipated in the preparation by the County's Bolinas-Stinson Beach Master Plan, which – among other items – called for infilling a portion of the west side of the lagoon to accommodate a mix of single-family and multi-family residences. To this end, the County Board of Supervisors proposed and voters confirmed the formation of the Bolinas Harbor District to ultimately finance and serve the anticipated new development focused on the lagoon shoreline.

2.2 Formation Proceedings

The formation of SBCWD was completed in 1962 with the County of Marin's Boundary Change Commission approving the official service area of the District followed by a successful vote of residents. The underlying priority in forming SBCWD was to authorize the District with the power to manage – directly or indirectly – wastewater service in the community given concerns regarding seepage into open waters tied to the

operation of individual septic systems; actual implementation of the District's wastewater authority was delayed to 1977 when special legislation was added to the principal act as detailed below. SBCWD was also authorized at formation to provide garbage and water services although both activities were not immediately activated.

2.3 Post-Formation Activities

A summary of notable activities undertaken by SBCWD and/or affecting the District's service area following formation in 1962 is provided below.

- 1960s • LAFCO approved and area voters confirmed the dissolution of the Bolinas Harbor District in 1969. The dissolution of Bolinas Harbor District – which included Stinson Beach – marked a prominent change in land use and service planning for the community and effectively terminated the Bolinas-Stinson Beach Master Plan by eliminating the conduit to finance and operate the necessary public work improvements for the 22,000 acre project site.
- 1970s • The Golden Gate National Recreational Area (GGNRA) was established by the United States Congress in 1972 and covers close to one-third of SBCWD's jurisdictional boundary and includes Stinson Beach.¹²³ The establishment of GGNRA coupled with the earlier creation of the Mount Tamalpais State Park collectively means four-fifths of SBCWD's jurisdictional boundary is dedicated to public use and limits future development opportunities to an approximate 2.4 square mile area.
- SBCWD received voter approval to purchase the Stinson Beach Water Company from owner George Leonard in 1974. The purchase included SBCWD acquiring all related water rights and facilities that has been previously merged together from George Leonard's earlier purchase and consolidation of the Stinson Water Company and Golfito Water Company in 1965.
- The County adopted the Stinson Beach Community Plan in 1976. The Community Plan was updated in 1985 and serves as the key visioning document in prescribing desired land use and related management policies. It includes an explicit policy statement for all related land use and service plans to strive to maintain the "rural atmosphere and individual character" of the community. The Community Plan, accordingly, discourages multi-family residences, franchise establishments, and buildings over 25 feet.¹²⁴

¹²³ The northern end of Stinson Beach is owned and operated by the County of Marin.

¹²⁴ The Community Plan also assigns responsibilities to an appointed nine-member Advisory Board (Village Association) to serve as a liaison with the County on all related land use and service matters affecting Stinson Beach.

1970s

- Special legislation was chaptered in 1977 amending California Water Code providing SBCWD the immediate authority to regulate private septic systems within its jurisdictional boundary. The special legislation was supported by the County and empowers SBCWD to regulate, prohibit, and control public and private septic systems through a District permitting process.¹²⁵
- SBCWD voters approved a \$0.6 million bond measure in 1977 to upgrade the District's water system to repair the distribution system as well as add new storage tanks; all of which were completed by 1983.

2000s

- County Service Area (CSA) No. 33 was formed by voters in 2003 to replace the Stinson Beach Landscape and Lighting District. CSA No. 33 assumed responsibility for levying and collecting a special assessment on Stinson Beach property owners to provide maintenance of local park, recreation, and parkway facilities and most notably the Stinson Beach Village Green Park.
- SBCWD voluntarily prepared and adopted an Urban Water Management Plan in 2006 to assess water reliability for the District over the next 20 years.¹²⁶ The document noted SBCWD's average day demand for water was 0.136 million gallons and translated to an average per connection daily use of 189 gallons.

2.4 Previous Municipal Service Review

The Commission's inaugural municipal service review on SBCWD was completed in December 2007 as part of a regional study on the Stinson Beach area.¹²⁷ This initial municipal service review provided a baseline evaluation of SBCWD and its entire service operations and concluded the District appeared to be operating efficiently in terms of service provision and in a fiscally sound manner with no significant infrastructure needs or deficiencies identified. The initial municipal service review did note accountability for local services would be enhanced through consolidation of the special districts serving Stinson Beach although no implementation recommendations were included.

¹²⁵ Violations of SBCWD's permit is a misdemeanor and punishable by fine up to \$1,000 or 60 days of jail for each day of violation.

¹²⁶ State law requires every urban water supplier that either provides over 3,000 acre-feet of water annually or serves more than 3,000 or more connections to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple dry years and as part of an Urban Water Management Plan.

¹²⁷ Other agencies in the municipal service review were Stinson Beach Fire Protection District, and CSA No. 33.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

SBCWD’s existing jurisdictional boundary is approximately 10.0 square miles in size and covers 5,975 unincorporated acres with close to one-fourth (1,445 acres) underwater and comprising Bolinas Lagoon.¹²⁸ There are overall 941 legal parcels within SBCWD based on County Assessor’s Office records. Ownership of these parcels is divided between 90.6% private and 9.4% public/non-profit titleholders with the latter category accounting for close to four-fifths of all jurisdictional lands.¹²⁹ Total assessed value (land and structures) within SBCWD is set at \$400.4 million as of January 2015.

SBCWD’s jurisdictional boundary spans 10.0 square miles with a current total assessed value of \$400.4 million; the latter of which represents an estimated per capita assessed value of \$0.204 million.

The portion of SBCWD’s jurisdictional boundary under private ownership is nearly built-out with 707 – or 82.8% – of the 853 affected parcels already developed according to County Assessor records. Remaining development potential within SBCSD appears limited to the eventual building of 37 vacant parcels that are designated/zoned for single-family use and are all at least 0.344 acres or more in size; the lowest and most prevalent minimum density requirement under the County within SBCWD.¹³⁰ The County has separately identified a current buildout potential of 60 new residential units – an amount that includes second units while accounting for setback and access limitations – within SBCWD as part of their 2015-2023 Housing Element.

SBCWD’s Jurisdictional Boundary Characteristics	
Table 4-66 (Marin LAFCO / MarinMap)	
Total Jurisdictional Acreage.....	5,975
Total Jurisdictional Parcels.....	941
- Number of Parcels Under Private Ownership / Total Acres.....	853/ 284.9
- Number of Parcels Under Public Ownership / Total Acres.....	88/ 4,685.1
- Total Number of Public Right-of-Way Acreage.....	1,005.4
- Percentage of Parcels Under Private Ownership Developed.....	82.8
- Percentage of Parcels Under Private Ownership Undeveloped.....	17.2
Total Number of Registered Voters.....	451
Total Assessed Value.....	\$400.450 m

Notes to Boundary Characteristics Table:

- 1) There are 60 parcels within SBCWD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

SBCWD’s jurisdictional boundary has remained entirely unchanged with no recorded boundary changes since LAFCOs were created in 1963.

¹²⁸ The portion of the Bolinas Lagoon in SBCWD is approximately 1,445 acres or 2.3 square miles.

¹²⁹ SBCWD owns 1.1 acres within its jurisdictional boundary.

¹³⁰ An approximate unit assignment to these 37 vacant parcels within SBCWD is estimated by LAFCO at 51.

3.3 Sphere of Influence

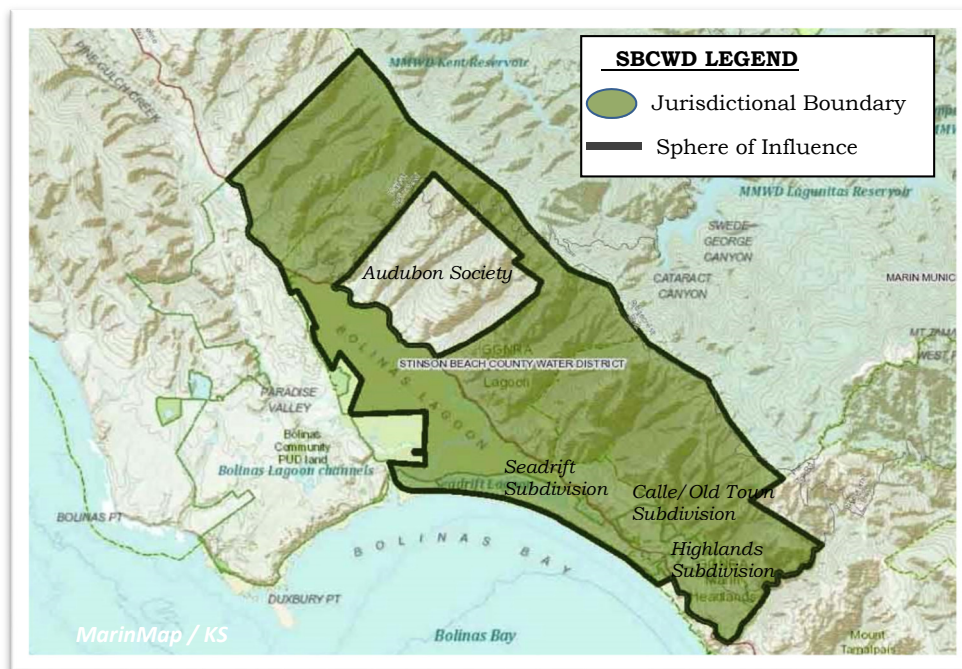
SBCWD’s sphere of influence was established by the Commission in December 1984. The established sphere of influence was purposely set to match SBCWD’s entire 6,415 acre jurisdictional boundary with no additional lands.¹³¹ (This includes the purposeful exclusion approximately 1,440 acres of land owned by the Audubon Society that lies in the middle of SBCWD’s jurisdictional boundary.) The Commission also directed staff return with a review of the sphere of influence no later than 1989 to consider the merits of removing all GGNRNA lands north of Stinson Beach; a review that ultimately did not occur. The Commission updated the sphere of influence in December 2007 consistent with CKH with no changes.

SBCWD’s sphere is coterminous with the District’s jurisdictional boundary; i.e., this baseline suggests no expansion of the jurisdictional boundary is expected as of the last update in 2007.

3.4 Outside Services

SBCWD reports it does not provide any services – and specifically potable water – outside its existing jurisdictional boundary.

3.5 Agency Map



¹³¹ The established sphere of influence was approved by the Commission three-to-two with both county members casting the dissenting votes given their concerns over the associated staff report suggesting SBCWD and SBFPD should ultimately be consolidated.

4.0 Demographics

4.1 Population Estimates

SBCWD’s resident population within its jurisdictional boundary is estimated by the Commission at 1,957 as of the term of this study period.¹³² This projection also indicates SBCWD is at 92.1% with respect to meeting its projected resident buildout total of 2,125.¹³³ The current resident estimate, which is based on a modified calculation provided under State law specific to public water systems, represents a total population growth rate of 0.7% over the preceding study period or 0.14% annually and tied to the construction and occupancy of five new single-family residences since 2008. This projected growth rate is slightly above the annual rate for the entire county over the same five year stretch – 0.6% - with the current population total in the District representing 0.8% of the countywide total.¹³⁴

LAFCO estimates there are 1,957 total residents within SBCWD that are explicitly served by the District’s potable water system as of the term of this study. This means SBCWD is at 92% of its resident buildout, and not expected to reach buildout until 2072.

With respect to projections going forward, and for purposes of this review, it is reasonable to assume the annual growth rate within SBCWD will match the preceding study period at 0.14%. The substantive result of this assumption would be an overall increase in SBCWD’s resident population of 28 and total 1,985 by 2023. It also indicates – and if this growth rate were to hold thereafter – SBCSD will reach its estimated resident buildout of 2,125 in the year 2072. These collective projections – past, current, and future – are summarized below.

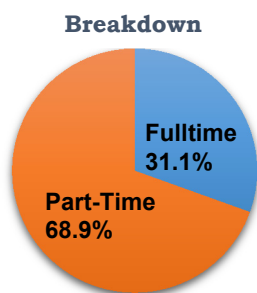
LAFCO Population Estimates for SBCWD				
Table 4-67 (Marin LAFCO)				
2009	2013	2018	2023	Annual Trend
1,943	1,957	1,970	1,985	0.14%

¹³² California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid combing the second and third options is appropriate for purposes of this review and involves multiply the number of SBCWD residential service connections – 699 - by 2.8 to produce 1,957.

¹³³ The current buildout projection for SBCWD of 1,957 is drawn from identifying the number of new units – 60 – that could be accommodated within the District based on the current County of Marin Housing Element and multiplied by a factor of 2.8. Actual construction is subject to external factors and highlighted by market demands and permit approvals from the County.

¹³⁴ Countywide total population is estimated at 254,007 as of January 2014.

4.2 Residency Type



The Commission projects that SBCWD’s estimated residential total of 1,957 as of the term of the study period is divided between 608 fulltime and 1,359 part-time residences.¹³⁵ This projection – which is premised on the assumption of limited rental properties in SBCWD – is based on a review of current Assessor records and indicates less than one-third of the population is present during normal weekdays and increases by over 200% during peak weekend and summer periods.

4.3 Social and Economic Indicators

A review of demographic information for the Stinson Beach community covering the study period indicates SBCWD’s fulltime residents are becoming increasingly older and more homogenous compared to countywide averages based on census data collected between 2005 and 2012. The data also shows a sharp economic decline with SBCWD residents experiencing over a one-fourth decrease in the median household income while also experiencing a comparable increase in median age. This dynamic suggests younger professionals in the community were disproportionately affected by the great recession and have moved out of the area in greater numbers than their older counterparts. Average commute times have remained relatively stagnant and over one-third above the countywide mean at nearly 40 minutes.

SBCWD’s fulltime constituents are becoming increasingly older and more homogenous relative to countywide averages. SBCWD’s residents have also experienced a sharp decline in economic standing over the last decade with median houseline income declining by over one-fourth.

SBCWD Resident Trends in Social and Economic Indicators				
Table 4-68 (Marin LAFCO / American Communities Survey)				
Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Avg.
Median Household Income	\$112,279	\$88,750	(21.0%)	\$90,962
Median Age	47.5	54.9	15.6%	44.6
Prime Working Age (25-64)	79.8%	56.5%	(29.2%)	56.6%
Unemployment Rate (Labor Force)	0.0%	0.0%	-	4.5%
Persons Living Below Poverty Rate	4.2%	3.6%	(14.3%)	7.5%
Mean Travel to Work	39.1 minutes	39.4 minutes	0.1%	28.4 minutes
Adults with Bachelor Degrees or Higher	60.7%	64.3%	0.6%	54.6%
Male	58.4%	55.1%	(5.7%)	49.2%
Female	41.6%	44.9%	7.9%	50.8%
White / Non Hispanic	89.7%	96.4%	7.5%	73.1%
Hispanic	8.2%	3.6%	(56.1%)	15.3%
Other	2.1%	0.0%	n/a	11.6%

¹³⁵ This projection is based on multiplying the total number of units assigned to all developed lots within SBCWD with local ownership mailing addresses – 217 – by an occupancy factor of 2.8 to produce a 31.1 (fulltime) to 68.9 (part-time) percentage split.

5.0 Organizational Structure

5.1 Governance

SBCWD’s governance authority is codified under the County Water District Act (“principal act”) and empowers the District to provide a limited purpose of municipal services upon approval by LAFCO. SBCWD – which is currently one of 162 county water districts operating currently in California – is presently authorized to provide three specific services within its jurisdictional boundary: (a) potable water; (b) onsite wastewater management (special legislation); and (c) solid waste/garbage. All other latent powers enumerated under the principal act would need to be activated by the Commission before SBCWD would be allowed to initiate. A list comparing active and latent power authorities under the principal act follows.

LAFCO approval is needed for SBCWD to activate a latent power or divest itself from an existing service.

Active Service Powers

- Potable water services
- onsite wastewater management
- solid waste/garbage

Latent Service Powers

- reclamation
- recreation
- hydroelectric power
- fire protection
- wastewater

SBCWD has been governed since its formation in 1962 as an independent special district with registered voters comprising a five-member governing board. Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating president system and receive a \$100 meeting per diem. SBCWD currently meets on the third Saturday at 9:30 A.M. of each month at the District’s Administrative Office located at 3785 Shoreline Highway in Stinson Beach.

A listing of Board members as of January 2015 along with respective backgrounds and continuous years of service on SBCWD follows.

SBCWD Board Roster			
Table 4-69 (SBCWD)			
Member	Position	Background	Years on Board
Barbara Boucke	Chair	accountant	1
Lawrence A. Baskin	Vice Chair	attorney	1
Sandra Cross	Member	attorney	2
Morey Nelsen	Member	engineer	2
Jim Zell	Member	firefighter	1
Average Years of Board Experience			1.4

5.2 Administration

SBCWD appoints an at-will General Manager to oversee all District activities. The current General Manager – Ed Schmidt – was appointed by the Board in 2007 and is presently budgeted for 40 hours per week and generally works out of SBCWD’s Administrative Office. The General Manager oversees seven employees that includes a supervisor dedicated to overseeing the water system. SBCWD also contracts with a private accountant to oversee billing and prepare financial statements. Legal services are also provided by contract with the Law Offices of Hanson Bridgett in Larkspur.

SBCWD Administrative Offices



SBCWD Administration

Table 4-70 (SBCWD)

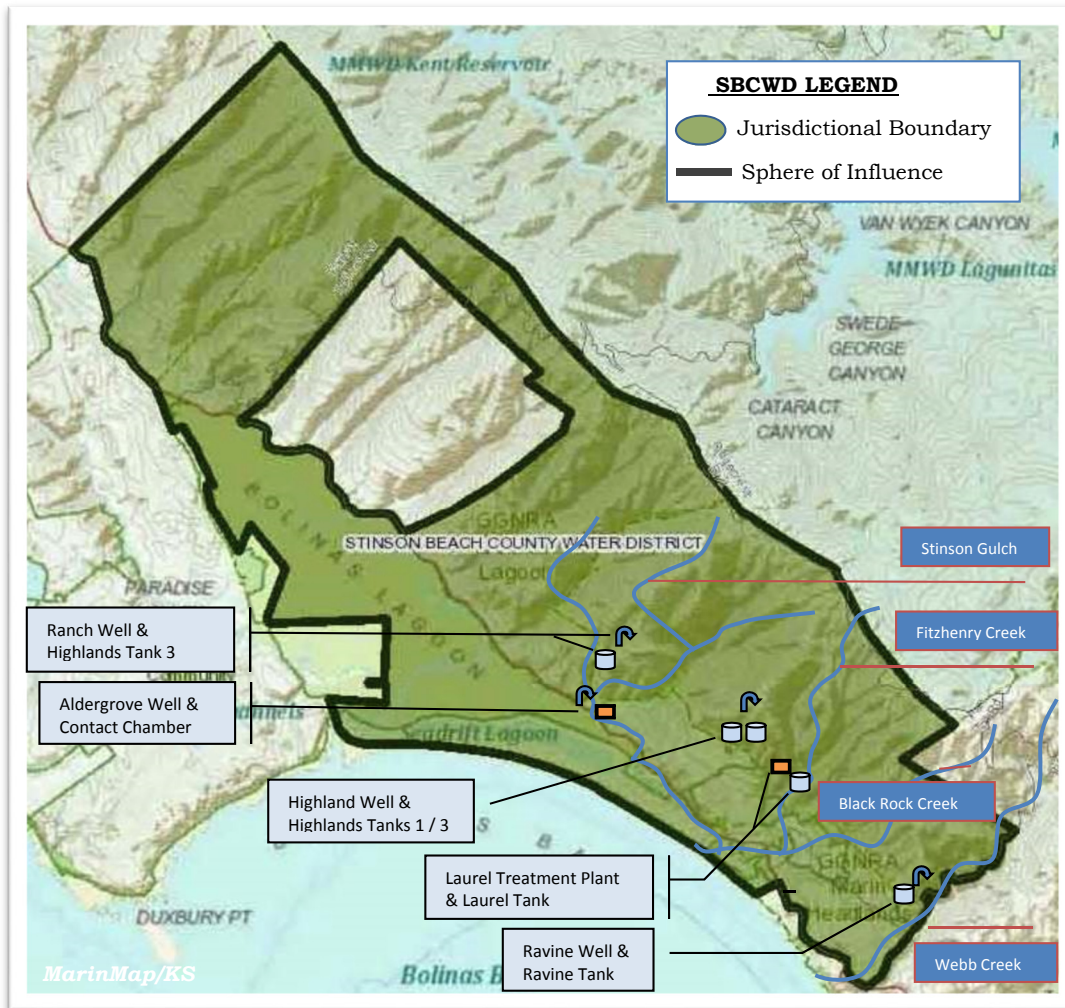
General Manager.....	Ed Schmidt
Legal Counsel.....	Hanson Bridgett
Water System Operator.....	Toby Bisson

6.0 Potable Water Services

6.1 Service Overview

SBCWD directly provides retail potable water services through its own supply, treatment, storage, and distribution facilities. These facilities were originally constructed by two separate private water entities – Stinson Beach Water Company and Goflito Water Company – beginning in the early 1900s before their merger in 1965. SBCWD purchased the merged private water system and all facilities and water rights therein in 1974. The distribution system itself spans approximately 10 miles with service lines dating as far back as 1904 with the most recent lines having been replaced in 2014 and within the Calles and Patio area. The span of the water system itself is limited to the southern portion of SBCSD.

An overview of SBCWD’s water system in terms of key infrastructure is shown below.



6.2 Water Supplies

SBCWD’s potable supplies are locally sourced from both surface water and groundwater lying within an approximate 4.0 square acre section of the Pine Gulch Watershed.¹³⁶ These sources collectively provide SBCWD with access to an estimated *maximum* available annual yield of 1,262.4 acre-feet based on applicable flow and pumping capacities (emphasis). A summary of SBCWD’s primary and supplemental water source supplies follows.

SBCWD’s maximum annual potable water supply yield is estimated at 1,262 acre-feet based on applicable flow and pumping capacities.

¹³⁶ The Pine Gulch Watershed spans from Stinson Beach towards Olema and is totals 17.2 square miles according to surveys completed by the County of Marin.

Primary Sources

Surface water historically accounts for a slight majority of all annual potable supplies utilized by SBCWD and are the most abundant source to the District in terms of availability. This supply is generated through four area creeks: Blackrock; Fitzhenry; Stinson Gulch; and Webb. SBCWD diverts water from all four surface sources through pre 1914 appropriative rights with the State Water Resources Control Board. These rights allow SBCWD to divert water from all four surface sources without day, month, or annual limitations other than climate constraints and, as applicable, pumping requirements.

SBCWD's potable supplies are all locally sourced and divided between surface water and groundwater with the former historically serving as the primary source. Three creeks serve as SBCWD's primary surface sources and are Stinson Gulch, Fitzhenry, and Black Rock.

Stinson Gulch Creek serves as SBCWD's primary surface source and typically accounts on its own for two-fifths of all annual surface diversions by the District. The diversion point to Stinson Gulch Creek is located at higher elevation to the remainder of the water system and conveys water directly and by gravity to SBCWD's treatment facilities. Diversion points to Black Rock and Fitzhenry Creeks are also located at elevation and provide gravity conveyance to SBCWD's treatment facilities and generally account for the remainder of the District's average surface water uses. Webb Creek is used infrequently because a pump station is needed to convey water to SBCWD's treatment facilities. The total *maximum* annual yield tied to these four pre-1914 surface sources is estimated at 1,072.3 acre-feet and has accounted for 50% of SBCWD's water supplies over the study period (emphasis).

Secondary Source(s)

Groundwater accounts for the SBCWD's remaining potable supply – which on recent average is slightly less than one-half of annual totals – and generated from pumping four wells all of which lie on District owned property. These wells pump water from local aquifers and therefore do not require permits from the State Resources Control Board. The primary well accounting for generally close to one-half of total groundwater production by SBCWD per year is the “Alder Grove” well. Its most recent drilling occurred in 2005 and is at a depth of 80 feet in the Stinson Gulch area. The “Ranch” and “Highlands” wells are also regularly used by SBCWD. The Ranch well is located in the Stinson Gulch area and drilled in 1981 at a depth of 104 feet. The Highlands site was drilled in 1981 at a depth of 265 feet. The fourth and final well is “Steep Ravine” and was drilled in 2010 at a depth of 310 feet and used only as an emergency source. All four wells have stationary electrical submersible pumps connected to utility lines with ratings that either meet or which exceed tested minute yields. The combined

maximum annual yield tied to these four wells if run continuously and less any recharging needs is 190.5 acre-feet (emphasis).¹³⁷

Supply Average

SBCWD's average yield drawn over the study period from the District's surface potable water sources – Blackrock, Fitzhenry, Stinson Gulch, and Webb Creeks – has been 22.421 million gallons or 68.8 acre-feet.¹³⁸ The single-highest year-end use of these four surface sources over the last five years occurred in 2011 when SBCWD collectively drew 24.116 million gallons or 74.0 acre-feet; an amount that exceeds the average annual take by close to one-tenth. SBCWD has also pumped on average over the same period 21.877 million gallons or 67.1 acre-feet in groundwater from its four sites.¹³⁹

SBCWD's average annual potable water yield over the study period from its four surface and four groundwater sources has been 135.9 acre-feet.

Supply Reliability

Like other public water service providers in West Marin the reliability of SBCWD's water supplies are relatively safe from external restrictions given they are entirely locally sourced. SBCWD's supply reliability is further enhanced given the District holds pre 1914 appropriative rights to all of its local water sources and does not have permit limitations on the amount it can draw. The lone – albeit significant – restrictions to SBCWD's water supplies are climate patterns affecting rainfall for runoff and recharging as well as infrastructure limitations and specifically pumping capacities to capture and convey water supplies.

SBCWD evaluated the reliability of its water supplies with the voluntary preparation of an Urban Water Management Plan in 2006 and measured monthly flows within each of its four surface creeks along with historical flows in nearby San Geronimo Creek.¹⁴⁰ Well tests were also utilized by SBCWD to project total groundwater availability. The resulting analysis was used to identify water availability to SBCWD relative to (a) normal and (b) dry-year conditions with the latter involving reductions of 56% in normal available surface supplies and 25% in normal available groundwater supplies. These reductions calculated by SBCWD would reduce the District's available water supply from 1,262.8 acre-feet in normal years to 698.1 acre-feet in dry years.

¹³⁷ The maximum annual groundwater yield is based on the pumping capacities at Alder Grove (70 gallons per minute), Ranch (23 gallons per minute), Highlands (20 gallons per minute), and Steep Ravine (5 gallons per minute).

¹³⁸ Statement reflects SBCWD filings with the State Resources Control Board between 2013 and 2009.

¹³⁹ Average groundwater use covers only 2012 through 2009.

¹⁴⁰ Flow data for Fitzhenry Creek was collected beginning in 2001 with data for Stinson Gulch, Black Rock, and Webb beginning in 2004. Flow data for San Geronimo Creek began in 1980.

While SBCWD has prepared its own supply projections for dry year conditions as summarized above, LAFCO believes it is appropriate to apply a further conservative reduction in supplies for purposes of planning tied to this review. This involves applying a flat curtailment to all water (surface and groundwater) sources of 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought.¹⁴¹ The substantive result of applying this reduction in SBCWD’s available annual water supply is a decline from 1,262.8 acre-feet in normal years to 298.07 acre-feet in drought year conditions.

LAFCO projects SBCWD’s annual potable water supplies declining by 76% to 298 acre-feet in drought-year conditions similar to 1976-77 runoff.

The following table summarizes SBCWD’s water supply sources relative to right/permit allowance, normal year conditions, and drought year conditions.

SBCWD’s Water Supply Availability with LAFCO Projections						
Listed in Acre-Feet Table 4-71 (Marin LAFCO / SBCWD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To SBCWD	Convey Year Max To SBCWD	76-77 Drought Day Max To SBCWD	76-77 Drought Year Max To SBCWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
Webb Creek (8572)	-- pre 1914 --	-- pre 1914 --	0.64	233.8	0.15	56.11
Black Rock Creek (8576)	-- pre 1914 --	-- pre 1914 --	0.25	91.7	0.06	22.00
Fitzhenry Creek (8571)	-- pre 1914 --	-- pre 1914 --	0.47	172.1	0.11	6.31
Stinson Gulch Creek (8575)	-- pre 1914 --	-- pre 1914 --	1.57	574.7	0.38	137.93
Groundwater Sites	-- overlying --	-- overlying --	0.52	190.5	0.12	75.72
	Total Yield		3.45	1,262.80	0.82	298.07

LAFCO Calculation
To Parallel 1976-77
Drought Conditions

Notes to Water Supply Table:

- 1) Pre 1914 water appropriative rights are not subject to external limitations on the amount of water diverted from the affected source and can only be lost through no-use or abandonment.
- 2) Overlying groundwater rights allow for the unrestricted use of water for the beneficial use to lands that are located over the affected aquifer and can only be lost through judicial action.
- 3) Water diverted from Black Rock, Fitzhenry, and Stinson Gulch Creeks are conveyed by gravity to SBCWD’s treatment facilities. Webb Creek is conveyed by a booster pump with a capacity of 145 gallons per minute.
- 4) Groundwater capacity under normal conditions is based on applicable pump testing for the four affected wells which collectively provide 118 gallons per minute to SBCWD and translates to 0.52 acre-feet per day or 190.5 annually. Individual well capacities are Alder at 70 gallons per minute, Highlands at 20 gallons per minute, Ranch at 23 gallons per minute, and Steep Ravine at 5 gallons per minute.
- 5) Dry/drought year conditions reflect a 76% reduction compared to normal/max year conditions and is based on matching the Department of Water Resources’ calculation for surface supply curtailment during the 1976-1977 drought.

¹⁴¹ State Water Project Delivery Report (2013) estimates 1976-1977 drought-like conditions reduces surface supplies to 24% of normal.

6.3 Water Treatment Facilities

SBCWD provides chlorine disinfectant treatment of the raw water received from seven of its eight surface water and groundwater sources at its Laurel Treatment Facility. Treatment for the eighth source – Adler well – is provided through an onsite contract chamber. The combined treatment capacity of the two facilities is 0.389 million gallons or 1.19 acre feet if run continuously. This latter amount equals 34.5% of the daily water supplies available to SBCWD under normal year conditions.

SBCWD treats all raw water collected from its primary and secondary local sources at either its Laurel Water Treatment Plant or Alder Grove Contract Chamber. These facilities have a combined daily treatment capacity of 389,101 gallons or 1.19 acre-feet.

As referenced, the Laurel Treatment Facility (“Laurel Plant”) processes most of SBCWD’s raw water sources and includes Stinson Gulch, Black Rock, Fitzhenry, and Webb Creeks as well as from Ranch, Highlands, and Steep Ravine wells.¹⁴² The current Laurel Plant was constructed in 2012 and provides membrane filtration treatment to coagulate and separate solids with the assistances of two chemical agents: aluminum sulfate and polymer. A third chemical agent - sodium hypochlorite is added to the filtered water before settling into an adjacent 0.320 million gallon clearwell tank. The daily treatment capacity at the Laurel Plant is 200 gallons a minute and *if* run continuously results in a daily maximum total of 0.288 million gallons or 0.88 acre-feet (emphasis). This treatment capacity at the Laurel Plant, notably, equals one-fourth of the 1.034 million gallons of accessible water SBCWD can draw from the affected seven sources based on pump capacities and year-round flow averages.

Groundwater taken from the Alder Grove site – which historically serves as SBCWD’s single largest water source – is treated through an onsite flash contact tank chamber injected with chlorine. Treatment capacity for the Alder Grove site is directly tied to the well pump and is currently tested to provide a maximum yield of 70 gallons a minute and *if* run contiguously results in a daily maximum total of 0.101 million gallons or 0.31 acre-feet (emphasis).

SBCWD’s Water Treatment Facilities		
Table 4-72 (SBCWD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Laurel Treatment Plant	aluminum sulfate(coagulate) polymer (coagulate) sodium hypochlorite (chlorine)	288,000 gallons / 0.88 acre-feet
Alder Grove Contact Chamber	sodium hypochlorite (chlorine)	101,000 gallons / 0.31acre-feet
Total		389,101 gallons / 1.19 acre-feet

¹⁴² All seven listed sources treated by the Laurel Plant are conveyed by gravity with the exception of supplies diverted from Webb Creek, which requires a pump station to receive treatment.

6.4 Water Quality

SBCWD’s most recent water quality report for the study period was issued in July 2014 and covers sample testing for 2013 based on 200 sample takings. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the Department of Health Services (DHS); the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found.¹⁴³ While not a contaminant, testing did show above-average levels of calcium and magnesium in samples and resulted in a DHS rating of “moderately hard” water. No actions were required by DHS as a result of the 2013 testing.

SBCWD’s last water quality report during the study period shows no excessive primary or secondary contaminants and required no actions by DHS.

6.5 Water Distribution System and Storage Facilities

SBCWD’s potable distribution system consists of approximately 10 miles of mains and overlays five connected pressures zones that collectively cover a 400 foot range in elevation between service connections. The main pressure zone is termed “Laurel” and serves the downtown and surrounding lowlands, including Calles and Seadrift. This main pressure zone relies on gravity recharge directly from the Alder Grove well site and/or the Laurel Clearwell Tank and its 0.320 million gallons or 0.99 acre-foot holdings.

SBCWD’s potable storage capacity within the distribution system totals 3.64 acre-feet and can accommodate up to 4.8 days of average peak-day demand totals over the study period.

SBCWD’s other four pressures zones are located at higher elevations and require pumping from the Laurel Clearwell Tank and its 230 gallon per minute pump station. Pumped water enters the three Highlands pressure zones (Highlands One, Two, and Three) and is stored in one of two 0.320 million gallon storage tanks that collectively hold 1.96 acre-feet. A separate pump station in the Highlands with a 30 gallon per minimum capacity also is used to convey water to the fifth and highest pressure zone, Steep Ravine. This highest pressure zone serves the upper Panoramic Highway area and relies on single storage tank with a 0.225 million gallons or 0.69 acre-feet.

SBCWD’s Potable Storage Tanks

Table 4-73 (Marin LAFCO / SBCWD)

Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Laurel	n/a	Downtown, Calles, Seadrift	320,000 gallons / 0.99 acre-feet
Highlands One	n/a	Highlands Subdivision	640,000 gallons / 1.96 acre-feet
Highlands Two	n/a	Upper Stinson	above
Highlands Three	n/a	Panoramic Highway	above
Steep Ravine	n/a	Upper Panoramic Highway	225,000 gallons / 0.69 acre-feet
Total:			1,185,000 gallons / 3.64 acre-feet

¹⁴³ Minimal levels of arsenic, fluoride, and nitrate was detected on samples taken on August 13, 2013, but were well below the maximum limit set by DHS.

6.6 Water Service Connections

SBCWD serves 727 active potable water service connections as of the term of the study period and divided between 699 residential and 28 non-residential customers; the latter of which includes 25 commercial users. Connections have been relatively stagnant over the last five year period and have increased by only five or 0.7% and all involve new residential hook-ups. SBCWD reports none of the current water connections lie outside the District’s jurisdictional boundary.

Trends in SBCWD’s Potable Water Connections

Table 4-74 (SBCWD)

Category	2009	2010	2011	2012	2013	5-Year Change
Non Residential	28	28	28	28	28	0.0%
Residential	694	696	697	698	699	0.7%
	722	724	725	726	727	0.7%

6.7 System Demands

SBCWD’s average annual potable water production demand (metered and losses) over the **study period** has been 53.7 million gallons or 164.8 acre-feet (see footnote 37).¹⁴⁴ The most recent completed year showed a total water demand of 55.6 million gallons or 170.6 acre-feet. This most recent amount represents an average daily water demand for the entire distribution system of 0.152 million gallons or 0.47 acre-feet; an amount that is further broken down to 209 gallons per day for every service connection. Per capita use has similarly decreased relative to per connections with a four year average of 75 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.238 million gallons or 0.73 acre-feet and was exactly double the daily average or a peaking factor of 1.55. The peak-day demand was recorded on July 6, 2013.

SBCWD’s average annual potable water production demand over the study period has been 165 acre-feet and translates to 203 gallons per day for every active connection. The average daily water demand per resident during this period is 75 gallons. Overall water demand production has increased on average by 2.4% annually and surpasses the corresponding percentage change in population by more than ten-fold.

With respect to trends, SBCWD has experienced an overall increase of 9.6% in water demand production over the study period or 2.4% annually. The overall increase in water demand production significantly outpaces the corresponding change in estimated population growth – 0.7% – by over ten-fold and suggest demands are largely rising due to the intensification of uses among existing development. Changes in peak-day demands nonetheless have decreased over the four-year period from 0.82 to 0.73 acre-feet or (11.0%). The overall peak day factor during this period is 1.67. The following table summarizes overall system demands over the last four years.

¹⁴⁴ Data for 2009 was not available. Production incorporates system sales and losses.

Study Period Trends in SBCWD's Water Demand Production

Table 4-75 (Marin LAFCO / SBCWD)

Category	2009	2010	2011	2012	2013	4-Year Average	4-Year Change
Annual Total	n/a	155.7	161.5	171.4	170.7	164.8	9.6%
Average Day	n/a	0.43	0.44	0.47	0.47	0.45	9.3%
Connection	n/a	724	725	726	727	726	0.4%
Per Day Connection	n/a	192g	199g	210g	210g	203 gallons	9.4%
Per Day Resident	n/a	71g	74g	78g	78g	75 gallons	9.9%
Peak Day	n/a	0.82	0.68	0.78	0.73	0.75	(11.0%)
Peaking Factor	n/a	1.91p	1.54p	1.66p	1.55p	1.67 peaking	(18.8%)

Year Amounts Shown in Acre Feet Unless Otherwise Noted

Projecting forward – and specifically for purposes of this study – it appears reasonable to assume SBCWD's overall water demands in its existing jurisdictional boundary will generally follow trends exhibited over the last four tracked years. It is estimated, accordingly and using linear regression to control for large variances in the most recent year-end totals, the system will experience an overall increase in water demand of 57 acre-feet over the next 10 years to 2023; a difference of 33.4% or 3.34% annually and an acceleration of over almost one-half more relative to the overall rise in the last four year tracked period.¹⁴⁵ It is also estimated the system's peak-day demands will trend consistent with recent amounts and the current four year average peaking factor of 1.67 – which incorporates recent variances as is – will hold and produce a high-day usage demand of 1.0 acre-feet by 2023.

LAFCO projects SBCWD's annual water demands will increase by 57 acre-feet or 3.3% annually by 2023; an intensity increase in use of nearly one-half compared to change over the study period. The anticipated daily usage is expected to similarly rise from 78 to 102 gallons per resident by 2023.

The following table summarizes projected demands in SBCWD over the next ten years.

LAFCO Projected Trends in SBCWD's Water Demands

Table 4-76 (Marin LAFCO)

Category	Baseline	2015	2017	2019	2021	2023	10-Year Change
Annual Total	170.7	183.9	194.9	205.8	216.7	227.7	33.4%
Average Day	0.47	0.50	0.53	0.56	0.59	0.62	31.9%
Peak Day	0.73	0.84	0.89	0.94	0.99	1.04	41.8%
Connections	727	729	731	733	735	737	1.4%
Per Day Connection	210g	225g	238g	251g	263g	276g	31.4%
Residents	1,957	1,962	1,968	1,973	1,979	1,985	1.4%
Per Day Resident	78g	83g	88g	93g	97g	102g	30.8%

Year Amounts Shown in Acre Feet Unless Otherwise Noted

¹⁴⁵ The calculated difference between annual usage change over the last five years – (.34%) – and the projected annual usage change over the next 10 years – 0.26% – is 176.5%.

Notes to LAFCO Projected Trends in Water Demands:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2010 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 1.67 ratio over average day demands based on 2009 to 2013 data.

6.8 Infrastructure Capacities to Demands

SBCWD’s water infrastructure is currently operating with available capacity in supply, storage, and treatment relative to average demands generated during the study period during normal and non-peak conditions. The available supply during drought-like conditions and specifically those matching the 1976-1977 drought, however, would significantly stress SBCWD’s ability to meet demands during high-demand periods in the absence of either adding supply or lowering usage. This specifically includes addressing the narrowing surplus capacity between SBCWD’s projected daily water supply of 0.82 acre-feet during a single dry-year drought versus the District’s current peak-day demand of 0.73 acre-feet; a difference of slightly more than one-tenth and a difference lowered by the prior year’s peak-day demand total of 0.78 acre-feet.

The following statements summarize and quantify existing and projected relationships between SBCWD’s capacities and demands now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Water Supply:

Annual Ratios

- Average annual water production demands generated over the study period represent 13% of SBCWD’s projected accessible sources under normal conditions. This ratio is expected to rise to 18% by 2023.
- Average annual water production demands generated over the study period represent 55% of SBCWD’s projected accessible sources under projected single dry-year conditions. This ratio is expected to rise to 76% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 22% of the new daily supply available to SBCWD under normal conditions. This ratio is expected to rise to 30% by 2023.
- Average peak-day water production demands over the study period are near capacity and represent 91% of the new daily supply available to SBCWD under projected single dry-year conditions. This ratio is expected to rise to a deficit of (27%) by 2023.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 63% of SBCWD’s existing potable treatment capacity. This ratio is expected to rise and approach capacity at 87% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 21% of SBCWD’s existing potable storage capacity. This ratio is expected to rise to 29% by 2023.
- More information is needed to determine the adequacy of potable storage within each of SBCWD’s five pressure zones.
- SBCWD’s potable storage capacity would allow the District to accommodate up to 4.9 consecutive days of average peak-day demands over the study period without recharge. This capacity is projected to decrease to 3.5 days by 2023.

Water Conservation / Mitigation:

- SBCWD’s administration has proven effective in soliciting reductions in system demands to match supplies in prior dry year conditions as evident most recently in 2010 when use declined by 5.8% over the prior year usage.
- SBCWD reports the water system was successfully stress-tested during the 1976-1977 drought as supplies were sufficient in meeting constituent demands. This prior stress-test suggests – albeit in the absence of 40 years of subsequent environmental changes and demand increases - the water supply may be more resilient and outperform the projections in this study in drought conditions.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 is provided below.

SCBCWD’s Capacity Relative to <u>Current</u> Demands			
Table 4-77 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply	✓		
...normal conditions			
...single dry-year conditions		✓	
Water Storage	✓		
Water Treatment	✓		

SBCWD's Capacity Relative to Projected Demands by 2023			
Table 4-78 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply ..normal conditions	✓		
..single dry-year conditions			✓
Water Storage	✓		
Water Treatment		✓	

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

SBCWD relies on two separate monthly charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) availability charges. The user charge is set by Board ordinance and is intended to provide full cost-recovery for the daily operation of the water system. The user charge was last updated by the Board in 2010 and is in tier format to apply an escalating rate based on consumption with current uses producing a monthly charge of \$39.78. The availability fee is based on meter size with most residential customers receiving a monthly charge of \$38.55. There are no voter approved special assessments tied to the operation and improvement of SBCWD's water system. The cumulative cost for most customers for water service is \$940 annually and results in a per 100 gallon equivalent charge of \$1.23 based on rates as of January 2015 and average uses generated during the study period.

The current average residential customer in SBCWD is paying \$939.96 annually in direct water charges based on a daily use of 210 gallons. This produces an approximate ratio of \$1.23 for every 100 gallons.

SBCWD also collects a connection fee for new customers. The connection fee for a typical single-family residential structure is presently set at \$17,500.

7.0 Agency Finances

7.1 Financial Statements

SBCWD contracts with an outside accounting firm (Maze and Associates) to prepare an annual report for each fiscal year to review the District’s financial statements in accordance with established governmental accounting standards. This includes, most notably, vetting SBCWD’s statements with respect to verifying overall assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing SBCWD’s short and long-term fiscal health.

SBCWD’s most recent financial statements during the study period were issued for 2012-2013 and shows the District experienced a modest positive change over the prior fiscal year as its overall equity or fund balance increased by nearly one-tenth from \$5.024 to \$5.071 million and tied to investments in capital infrastructure. A summary of year-end totals and corresponding trends over the last five years follows.

2012-2013 Financial Statements	
Assets	\$7.742 m
Liabilities	\$2.671 m
Equity	\$5.071 m

Agency Assets

SBCWD’s audited assets at the end of 2012-2013 totaled \$7.742 million and have increased during the last five years by 4.0%. Assets classified as current with the expectation they could be liquidated within a year represented slightly over one-fifth of the total amount with the majority tied to cash and investments. Assets classified as non-current represented the remaining fourth-fifths with the largest portion associated with water distribution system.

SBCWD Assets Study Period						
Table 4-79 (SBCWD)						
SBCWD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Assets	1.851	1.581	1.793	1.773	1.602	(13.5%)
Non-Current Assets	5.588	5.977	6.028	6.242	6.139	9.9%
	\$7.440	\$7.558	\$7.822	\$8.015	\$7.742	4.0%

amounts in millions

Agency Liabilities

SBCWD’s audited liabilities at the end of 2012-2013 totaled \$2.671 million and have steadily decreased during the last years with an overall difference of (19.7%). Current liabilities representing obligations mostly tied to accounts payable. Non-current liabilities represented the remaining nine-tenths and tied to two active loans totaling \$2.2 million to make improvements to the water system.¹⁴⁶

¹⁴⁶ The two loans are with the Association of Bay Area Governments for \$1.1 million and the California Statement Communities Development Authority for also for \$1.1 million.

SBCWD Liabilities Study Period						
Table 4-80 (SBCWD)						
SBCWD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Liabilities	0.388	0.321	0.377	0.392	0.319	(17.8%)
Non-Current Liabilities	2.940	2.826	2.706	2.598	2.352	(20.0%)
	\$3.328	\$3.147	\$3.083	\$2.991	\$2.671	(19.7%)

amounts in millions

Agency Equity / Net Assets

SBCWD’s audited equity / net assets at the end of 2012-2013 totaled \$5.070 million and represent the difference between the District’s total assets and total liabilities. This amount has increased by nearly one-fourth over the five previous fiscal years and primarily attributed to aforementioned reduction in liabilities and resulting increase in capital assets. The end of year equity amount includes a \$1.330 million balance in unrestricted funds.

SBCWD’s unrestricted fund balance total of \$1.3 million as of the term of the study period equates to a per capita amount of \$679.

SBCWD Equity Study Period						
Table 4-81 (SBCWD)						
SBCWD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Unrestricted	1.668	1.423	1.324	1.272	1.330	(20.3%)
Restricted	0.245	0.312	0.248	0.250	0.033	(86.3%)
Capital	2.198	2.674	3.165	3.505	3.706	68.6%
	\$4.112	\$4.410	\$4.738	\$5.024	\$5.070	23.3%

amounts in millions

7.2 Liquidity, Capital, and Margin

A review of the audited financial statement issuances by SBCWD covering the study period shows the District has maintained a constant and relatively high level of liquidity with short term assets continually outpacing short-term liabilities on average of nearly 5 to 1. SBCWD’ capital standing has slightly increased during this five year period as the District’s overall long-term debt levels have decreased by close to one-third and ending with debts equaling 46% of assets. Profitability has also remained positive in each of the last five years with an average operating margin during this time of 13.4%. A summary of year-end liquidity, capital, and operating margin ratios over the study period are show in the following table.

SBCWD Liquidity, Capital, and Margin Study Period			
Table 4-82 (Marin LAFCO)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	4.7 to 1	71.5%	10.47%
2009-2010	4.9 to 1	64.1%	15.67%
2010-2011	4.7 to 1	57.1%	17.35%
2011-2012	4.5 to 1	51.7%	14.79%
2012-2013	5.0 to 1	46.4%	8.61%
Average	4.8 to 1	58.2%	13.4%
5-Year Trend	0.1%	(35.1%)	(0.17%)

7.3 Pension Obligations

SBCWD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. SBCWD maintains two contract packages – termed “Tier One” and “Tier Two” – for employee pensions based on the date of hire. Tier One is based on a 2.7% at 55 formula and would provide an eligible retiree with 20 years of total service credit 54% of their highest year salary beginning at age 55 and continuing each year thereafter until death. Tier Two is based on a 2.0% at 62 formula and would provide an eligible retiree with 20 years of total service credit 40% of their highest three years of salary beginning at age 62 and continuing each year thereafter until death.

SBCWD’s Defined Pension Benefit Tiers	
Table 4-83 (Marin LAFCO / CalPERS)	
Category	Miscellaneous
Tier One (Pre January 2013).....	2.7% at 55
Tier Two (Post January 2013).....	2.0% at 62

Note:

All tiers provide up to a 2.0% annual cost-of-living adjustment

Funding contributions for SBCWD is based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arraignments between the District and its employees. A listing of recent and planned contribution rates for SBCWD as determined by CalPERS along with enrollee information follows.

SBCWD’s Minimum Contribution Rates to CalPERS					
Table 4-84 (Marin LAFCO / CalPERS)					
11-12	12-13	13-14	14-15	15-16	Trend
22.7%	23.1%	23.6%	24.9%	25.9%	14.1%
<i>Projected</i>					

SBCWD’s Pension Enrollee Information	
Table 4-85 (Marin LAFCO / CalPERS)	
Enrollee Type	As of June 30, 2013
Active.....	7
Transferred.....	1
Separated.....	4
Retired.....	9

SBCWD’s total annual pension contributions are on the rise in step with increasing liability based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. Overall SBCWD has increased its total annual pension contributions by 35.2% from \$0.105 million to \$0.142 million over the last three reported years; a change that exceeds the corresponding inflation factor for the San Francisco Bay area region during this period of 5.0% by over seven-fold. This increase in contributions, notably, has helped to improve SBCWD’s funded ratio – the market difference between the pension plan’s assets and liabilities –by 3.1% and ended the period at 67.3%. SBCWD’s unfunded liability – pension monies owed that are not covered by assets – nonetheless has also increased by 6.5% from \$1.086 million to \$1.157 million; an amount that equals 87.0% of the District’s undesignated fund balance as of the start of 2013-2014.¹⁴⁷ SBCWD’s worker-to-retiree ratio has also decreased by nearly one-fourth over the three-year period from 1.0 to 0.77; all of which means it is reasonable to assume employer and employee contributions will need to increase to simply maintain existing debt levels.

SBCWD’s unfunded pension liability has increased over the last three reported years and currently totals \$1.157 million; an amount that that equals 87.0% of the District’s undesignated fund balance as of the start of 2013-2014.

SBCWD Trends in Pension Measurements				
Table 4-86 (Marin LAFCO / CalPERS)				
Category	2010-2011	2011-2012	2012-2013	Difference
SBCWD Annual Contribution	\$0.105 million	\$0.130 million	\$0.142 million	35.2%
Funded Ratio – Market	65.3%	62.1%	67.3%	3.1%
Unfunded Liability - Market	\$1.086 million	\$1.201 million	\$1.157 million	6.5%
Funded Ratio – Actuarial	72.4%	73.2%	n/a	-
Unfunded Liability -Actuarial	\$0.863 million	0.850 million	n/a	-
Active to Retiree Ratio - active employees for every retiree	1.0	0.88	0.77	(23.0%)

Notes:

- 1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now).
- 2) Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.) CalPERS no longer calculates AVA measurements as of the 2012-2013 fiscal year.

¹⁴⁷ SBCWD’s undesignated fund balance (audited) as of June 30, 2013 totaled \$1.330 million.

7.4 Actual Revenue and Expense Trends

SBCWD has maintained positive revenue to expense differences in each of the five fiscal years covered in the financial statements covering the study period. Average year-end revenues over this period have totaled \$1.884 million with nearly four-fifths drawn from property taxes (40%) and water service charges/fees (38%). Average year-end expenses over the same period have totaled \$1.632 million and were led by staffing related expenses (55%). Both revenue and expense totals over the five year period have experienced upward movement with expenses outpacing revenues by 10%. A key factor underlying this trend in which expenses our outpacing revenues involves two-fold increases in SCBWD’s maintenance and insurance costs over the five-year period.

SBCWD’s has maintained a structured year-end balance with revenues exceeding expenses over year of the study period. However, the rate of growth within expenses has exceeded the rate of growth in revenues by nearly one-fourth.

A summary of the five-year actual averages in revenue and expense ledgers over the course of the study period follows.

Study Period Trends in SBCWD Revenues			
Table 4-87 (Marin LAFCO / SBCWD)			
Category	Five Year Average (2008-09 to 2012-13)	Five Year Average Portion of Total	Five Year Trend (2008-09 to 2012-13)
Property Taxes	745,453	40.0	4.2%
Water Charges/Fees	715,914	38.0	13.5%
Wastewater/Fees	391,653	20.8	12.5%
Interest/Investments	31,672	1.7	34.6%
Other	-	0.0	0.0%
Average	\$1,884,692	100%	9.8%

Study Period Actual Trends in SBCWD Expenses			
Table 4-88 (Marin LAFCO / SBCWD)			
Category	Five Year Average (2008-09 to 2012-13)	Portion of Total	Five Year Trend (2008-09 to 2012-13)
Personnel / Payroll	892,631	54.7	8.2%
General Admin / Supplies	220,475	13.5	21.2%
Insurance	38,165	2.3	214.9%
Engineering	64,389	4.0	(87.4)%
Maintenance	26,597	1.6	299.2%
Vehicles	15,475	1.0	(30.2)%
Utilities	41,373	2.5	(0.1)%
Other / Depreciation	332,949	20.4	16.2%
Average	\$1,632,055	100%	12.1%

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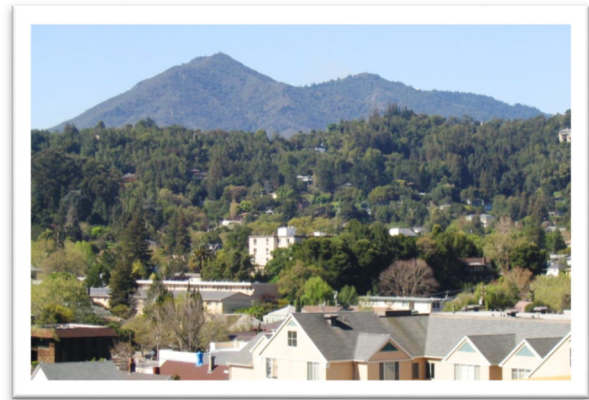
4.2 EAST MARIN REGION

A. MARIN MUNICIPAL WATER DISTRICT

1.0 Overview

The Marin Municipal Water District (MMWD) was formed in 1912 and encompasses an approximate 148 square mile jurisdictional boundary. The service area includes 10 of the 11 cities in Marin County along with 11 census designated unincorporated communities as well as the San Quentin State Prison.¹⁴⁸ Governance is provided by a five-person board whose members are registered voters elected by division to staggered four-year terms. MMWD overlaps multiple school districts with most students in the service area assigned to Drake, Redwood, San Rafael, Tamalpais, and Terra Linda High Schools.

Southwest San Rafael / Mt. Tamalpais



MMWD is currently organized as a limited-purpose agency and provides three distinct services: (a) potable water; (b) non-potable water; and (c) public recreation with the latter primarily dedicated to watershed management. Close to three-fourths of domestic water supplies are drawn from local reservoirs in Marin County and tied to diverting flows from Lagunitas, Nicasio, and Arroyo Sausal Creeks. The remaining one-fourth of MMWD’s potable water supplies is imported from Sonoma County and through a contract with the Sonoma County Water Agency. The average daily water use per estimated resident in MMWD over the study period has been 127 gallons.¹⁴⁹

MMWD’s service population is estimated by the Commission at 186,048 as of the term of this study (2013). It is also estimated MMWD’s service population – specifically those directly served by the District’s potable water system – has increased by 0.4% over the study period and falls slightly below the countywide growth rate average of 0.6% over the same period. The projected buildout population as calculated by the Commission and based on current planning policies of the 11 land use authorities within MMWD is estimated at

Marin Municipal Water District

Formation Date	1912
Enabling Legislation	Water Code Section 30000 et. seq.
Service Categories	Potable Water Non-Potable Water Public Recreation
Service Population	186,048
Registered Voters	110,224
Current Buildout Population Estimate	209,907

¹⁴⁸ There are currently 4,096 inmates assigned to the San Quentin State Prison as of February 2015.

¹⁴⁹ This amount is drawn from total water production between 2009 and 2013 and calculated using the Commission’s own resident population projections for MMWD.

209,907.¹⁵⁰ Registered voters total 110,224 and represents 59.2% of the current estimated service population. The adopted operating budget at the term of the study period \$60.5 million with funding anticipated to cover the labor costs for 228 equivalent fulltime employees. The unrestricted/undesignated fund balance was \$38.9 million and sufficient to cover 35 weeks of general operating expenses as set for 2013-2014.

2.0 Background

2.1 Community Development



MMWD's initial and primary service area – San Rafael – began its present-day development slowly in the late 1810s with the establishment of the Mission San Rafael as a sanitarium to treat the sick from Mission Dolores in San Francisco.¹⁵¹ Mission San Rafael and its supporting agricultural activities served as an early commerce anchor for the region, and the San Rafael Mission itself grew to a seasonal-high residency of nearly 1,000 by 1830. San Rafael's present-day development was further marked and aided with the inclusion of the region as part of three Mexican land grants – “Las Gallinas,” “Santa Margarita,” and “San Pedro” –

totaling over 21,000 acres to Timothy Murphy in 1844. Murphy kept the majority of the ranchos in cattle grazing through the time of his death in the early 1850s before leaving most of the lands to nephew John Lucas who subsequently began selling lots while retaining a homestead in present-day Terra Linda. John Lucas' decision to sell pieces of his newfound holdings, notably, coincided with outside developer interest in the region as a result of the establishment of ferry and railroad service byway of San Quentin Point and connecting San Rafael to San Francisco by 1860.

¹⁵⁰ Current and projected service populations are detailed in Section 4.1.

¹⁵¹ Information on the establishment of Mission San Rafael and immediate development of the region's ranchos is principally drawn from the Marin History Museum.

It appears San Rafael’s urban development began in earnest in the late 1860s with land speculation driving outside investment and highlighted by the purchase and subdivision of approximately 1,100 acres east of Mission San Rafael known as Irwin Ranch by William T. Coleman, a wealthy businessman from San Francisco.¹⁵² Coleman deduced an adequate water supply was needed to facilitate lot purchases in San Rafael, and he and business associates – who had previously established a similar private utility in San Francisco – established the eventual predecessor to MMWD with the creation of the Marin County Water Company (“MCWC”) in 1871. An immediate purchase of the neighboring San Rafael Water Company serving the downtown area provided an initial water source for MCWC through a spring site located northeast of Mission San Rafael with an estimated daily capacity of 40,000 gallons or 44.8 acre-feet annually. MCWC also began developing plans to establish a new and more reliable water source from Lagunitas Creek in the Mount Tamalpais watershed to serve both the growing San Rafael community and the San Quentin State Prison. MCWD began to effectuate these plans through successful condemnation actions against landowners along stream to secure all the waters of the Lagunitas Creek as well as other waters in and around San Rafael, including San Anselmo Creek. The County of Marin also aided these efforts and began on its own deeding rights to MCWC to utilize all public rights-of-ways in laying pipes to convey water from Lagunitas Creek in Mount Tamalpais into San Rafael and any other areas as the utility deemed necessary.

MCWC commenced service of Lake Lagunitas in 1873 with the completion of an earth-filled dam and corresponding placement of an eight-inch water main traveling the approximate six miles into San Rafael proper and another four miles to San Quentin. Lake Lagunitas was initially outfitted with a 150.0 million gallon or 460 acre-foot holding capacity with the inferred assumption it alone could support the growing water needs of San Rafael – which incorporated one year later in 1874 – as the service population reached an estimated 2,600 by 1875.¹⁵³ Supplies drawn from Lake Lagunitas, however, began to become taxed by the close of the century as MCWC continually expanded its service area into the developing Ross Valley. The emergence of seasonal outages coupled with perceived inequities in rate setting led to multiple inquires by the San Rafael City Council and other community leaders to consider legislation to allow the public to purchase and assume MCWC’s water system. (At the time, State law did not allow a public utility to operate water services in both incorporated and unincorporated areas.) These inquires appear to have prompted MCWC in developing two additional reservoirs to capture water from Lagunitas Creek in Moore Lake in 1894 (West San Rafael) and Phoenix Lake in 1905 (West Ross).¹⁵⁴ The added supply generated by the new reservoirs, however, proved only to serve as a temporary reprieve for MCWC and

¹⁵² Information on the establishment and subsequent development of the MCWC and its water supplies is drawn from two complimentary sources: (a) “*Mount Tamalpais and the Marin Municipal Water District*” by Jack Gibson and (b) “*The Old Company: The History of Water Development in South Central Marin County*,” by Robert W. Lethbridge.

¹⁵³ Service population estimate includes approximately 1,100 inmates at San Quentin State Prison.

¹⁵⁴ Moore Reservoir was taken offline by MMWD in the 1960s. Phoenix Reservoir remains online with its original holding capacity of 411 acre-feet and used as one of two MMWD emergency reservoirs due to high pumping costs.

ultimately gave way to a new move for change through the progressive movement of the early 1900s. This progressive movement, notably, ultimately served to end MCWC with the election of George Harlan from Sausalito to the California Assembly with the freshman legislator going on to successfully chaptering the “Municipal Water District Act of 1911;” legislation specifically penned to allow for the creation of public agencies spanning both incorporated and unincorporated areas to provide potable water service.

2.2 Formation Proceedings

MMWD’s formation was petitioned by area landowners to the State Legislature and subsequently approved by voters in November 1911 with the expectation the District would eventually purchase and assume all service operations from MWPC – formerly MCWC – and other private companies operating in Marin County as needed.¹⁵⁵ MMWD officially began business in April 1912 with a jurisdictional boundary that generally extended from San Rafael to Sausalito. A 13-member Board of Directors was also established divided between five elected members and eight appointed members from the seven incorporated communities (Belvedere, Larkspur, Ross, Mill Valley, San Anselmo, San Rafael, and Sausalito) and the County. A three-year process followed with MMWD studying the valuation to purchase and improve MWPC’s water system before the California Railroad Commission before a bond election was held in August 1915. This second election was approved by 77% of the electorate and authorized MMWD to sell up to \$3.0 million in bonds. Subsequent purchases by MMWD authorized by the bond election included MWPC and the North Coast Water Company – service provider for Mill Valley – along with 5,500 watershed acres on Mount Tamalpais.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by MMWD and/or affecting the District’s service area following its commencement of business in 1915 is provided below.

- 1910s • MMWD begins acquiring private water companies in 1916 with MPWD and North Coast Water Company. A total of 23 private systems were purchased by MMWD through 1933 extending as far north to Bayside Acres (Mt. Venice Water Company) and as far south to Sausalito (Sausalito Municipal Water System).
- Corte Madera incorporates with an effective date of June 10, 1916.
- MMWD establishes a park ranger program in 1917 to enforce rules and regulations with respect to public access and uses within District lands.

¹⁵⁵ MCWC was rechristened as the Marin Water and Power Company (MWPC) in August 1908.

- 1910s • Construction on Alpine Dam off of Lagunitas Creek is completed by MMWD in 1919 and results in Alpine Lake and its initial capacity of 3,068.4 acre-feet. An associated 24-inch transmission line was also constructed to reach Ross Valley through Fairfax. Alpine Lake is subsequently enlarged in 1941 to its current capacity of 8,891 acre-feet.
- 1920s • MMWD completes construction on an extension of the Alpine transmission line in 1920 to convey water from Ross Valley to San Quentin Point. The 12-inch extension line was funded by the California & Hawaii Sugar Company for purposes of purchasing and shipping water to its processing plant in Crocket.
- MMWD extends a transmission line through San Anselmo, Sleepy Hollow, and Terra Linda to present day Hamilton Field in the 1920s. The extension is funded by the Department of Defense to establish water supplies for the future site of a military airbase.
- 1930s • Fairfax incorporates with an effective date of March 2, 1931.
- 1940s • MMWD completes construction on the Bon Tempe Dam and Reservoir off of Lagunitas Creek in 1948. Bon Tempe Reservoir lies immediately north of Lake Lagunitas with a holding capacity of 4,017 acre-feet.
- 1950s • MMWD purchases and assumes water service responsibilities for the San Geronimo Valley Water Company in 1952 along with rights to Nicasio Creek.
- MMWD completes construction on the Peters Dam off of Lagunitas Creek and creates Kent Lake in 1953. Kent Lake is enlarged in 1982 to a capacity of 32,895 acre-feet; making it the single-largest reservoir in MMWD.
- MMWD voters approve a \$12.6 million bond in November 1956 to provide funding for several projects and marked by the construction of the Nicasio Dam off of Nicasio Creek. The resulting Nicasio Reservoir begins filling in 1960 and has a current capacity of 22,430 acre-feet.¹⁵⁶
- 1960s • Tiburon incorporates with an effective date of June 23, 1964.
- 1970s • MMWD enters into an agreement with the Sonoma County Water Agency for annual allocation of “off-peak” water supplies from the Russian River in 1975. The agreement and its subsequent restructure in 1996 provides MMWD an annual allocation of up to 14,300 acre-feet subject to pipeline capacity in the North Marin Aqueduct.

¹⁵⁶ Other notable improvements funded through the successful 1956 bond measure include building water treatment plants at Nicasio and Bon Tempe as well as funding the construction of a new MMWD office in Corte Madera.

- 1970s • In response to the second year of the 1976-1977 drought MMWD reaches agreement with outside agencies to receive up to 10,000 acre-feet of emergency supplies from the State Water Project. MMWD constructs a temporary 24-inch transmission line across the San Rafael-Richmond Bridge and ultimately receives close to 5,000 acre-feet between June and December 1977. The emergency transmission line is subsequently removed.
- 1980s • MMWD completes construction on the Soulajule Dam and Reservoir in 1982 as an emergency supply through diversions from Walker Creek. The holding capacity of Soulajule Reservoir is 10,572 acre-feet.
- 1990s • MMWD adopts a formal policy in 1995 to guide management of the District's watershed resources on Mount Tamalpais. The document – Mount Tamalpais Vegetation Management Plan – is updated in 2008.
- MMWD purchases and assumes service operations in 1996 for the Wolfback Water Company serving the Wolfback Ridge neighborhood in Sausalito.
- 2000s • MMWD commences studies in 2001 to evaluate desalination as a supplemental water supply. A preferred desalination plant alternative was ultimately identified to provide up to 15 million gallons or 46 acre-feet per day from San Rafael Bay, and MMWD adopts an environmental impact report in December 2008.
- MMWD prepared and completed its first Urban Water Management Plan in 2006. The document is updated in 2011 and projects MMWD having sufficient water supplies under various climate conditions and byway of significant conservation activities through the affected review period of 2035.
- 2010s • In August 2010, MMWD adopted an ordinance stating the District shall not approve construction of a desalination facility unless such action is approved by a majority of District voters.

2.4 Previous Municipal Service Review

The Commission's inaugural (2001-2007) and second (2008-2013) round of municipal service reviews did not include a study of MMWD.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

MMWD’s existing jurisdictional boundary is approximately 148 square miles in size and covers almost 95,000 acres; an amount that equals nearly one-fifth of all Marin County. These jurisdictional acres are proportionally divided between 38.8% incorporated and 61.2% unincorporated lands and collectively cover 66,387 legal parcels with a total assessed value of \$47.2 billion as of January 2015. Ownership is divided between 96% private and 4% public with the latter category disproportionately accounting for over one-half of all parcel acreage.

MMWD’s jurisdictional boundary spans 148 square miles with 61% of total District acres lying within the unincorporated area; the remaining 39% lies in 10 cities/towns.

As for pertinent characteristics, the portion of MMWD’s jurisdictional boundary under private ownership is largely developed – though not necessarily to maximum density – with 94% or 63,712 of the affected legal parcels with improved structures according to the County Assessor’s Office. This existing development, notably, includes 76,410 total residential units and divided between 56,417 or 73.8% within the 10 cities/towns and 19,993 or 26.2% in the unincorporated area. Going forward, it is projected the future residential development of the remaining privately owned and undeveloped/underdeveloped lots within MMWD is estimated by the Commission to include the future construction of 7,230 new units. This projection is further divided between the estimated future construction of 4,371 units or 60.5% in the 10 cities/towns and 2,859 or 39.5% in the unincorporated area as detailed in the accompanying footnote.¹⁵⁷

Projected future development within MMWD is estimated by LAFCO to include the future construction of 7,230 new residential units within the 11 land use authorities.

MMWD’s Jurisdictional Boundary Characteristics

Table 4-89 (Marin LAFCO / MarinMap)

Total Jurisdictional Acreage.....	94,970
Total Jurisdictional Parcels.....	66,387
- Number of Living Units.....	76,410
- Number of Parcels Under Private Ownership / Total Acres.....	63,712/ 27,614
- Number of Parcels Under Public Ownership / Total Acres.....	2,675 / 30,192
- Total Number of Water or Public Right-of-Way Acreage.....	37,165
- Percentage of Parcels Under Private Ownership Developed.....	94
- Percentage of Parcels Under Private Ownership Undeveloped.....	6
Total Number of Registered Voters.....	110,224
Total Assessed Value.....	\$47.274b

¹⁵⁷ The projected new residential development is based on land availability assessed in the affected 11 local land use authorities’ housing elements with the majority prepared for 2015-2023 cycle that totals 7,230. Approximately 40% or 2,859 of the projected new residential units are assigned to the unincorporated areas (Marinwood, Strawberry, etc.) with another 40% or 2,754 assigned to San Rafael. The remaining future residential units are assigned as follows: San Anselmo at 366; Mill Valley at 363; Corte Madera at 241; Sausalito at 170; Larkspur at 147; Fairfax at 143; Tiburon at 109; Ross at 61; and Belvedere at 17.

3.2 Boundary Trends

MMWD’s jurisdictional boundary has expanded by close to one-tenth since the Commission assumed responsibility in overseeing the District’s physical development and service area in 1963. Overall there have been 20 recorded boundary changes to MMWD during this period, with the majority tied to subdivision annexations in Upper Lucas Valley. The most recent boundary change of significance occurred in 2002 with the 980-acre detachment of the former Hamilton Air Force Field as part of negotiated reorganization in which the lands were concurrently annexed to North Marin Water District. The last five boundary changes involving MMWD are listed below.

MMWD’s Last Five Boundary Changes			
Table 4-90 (Marin LAFCO)			
Affected Area	Action	Completion Date	Acreage
Lucas Valley Road / Upper Lucas Valley	Annexation	September 23, 1991	1.00
Hamilton Field / South Novato	Annexation	August 6, 1993	0.40
Wolfback Subdivision / Sausalito	Annexation	February 18, 1994	22.50
Hamilton Field / South Novato	Detachment	June 24, 2002	980.17
Lucas Valley Ranch / Upper Lucas Valley	Annexation	March 11, 2004	12.29

3.3 Sphere of Influence

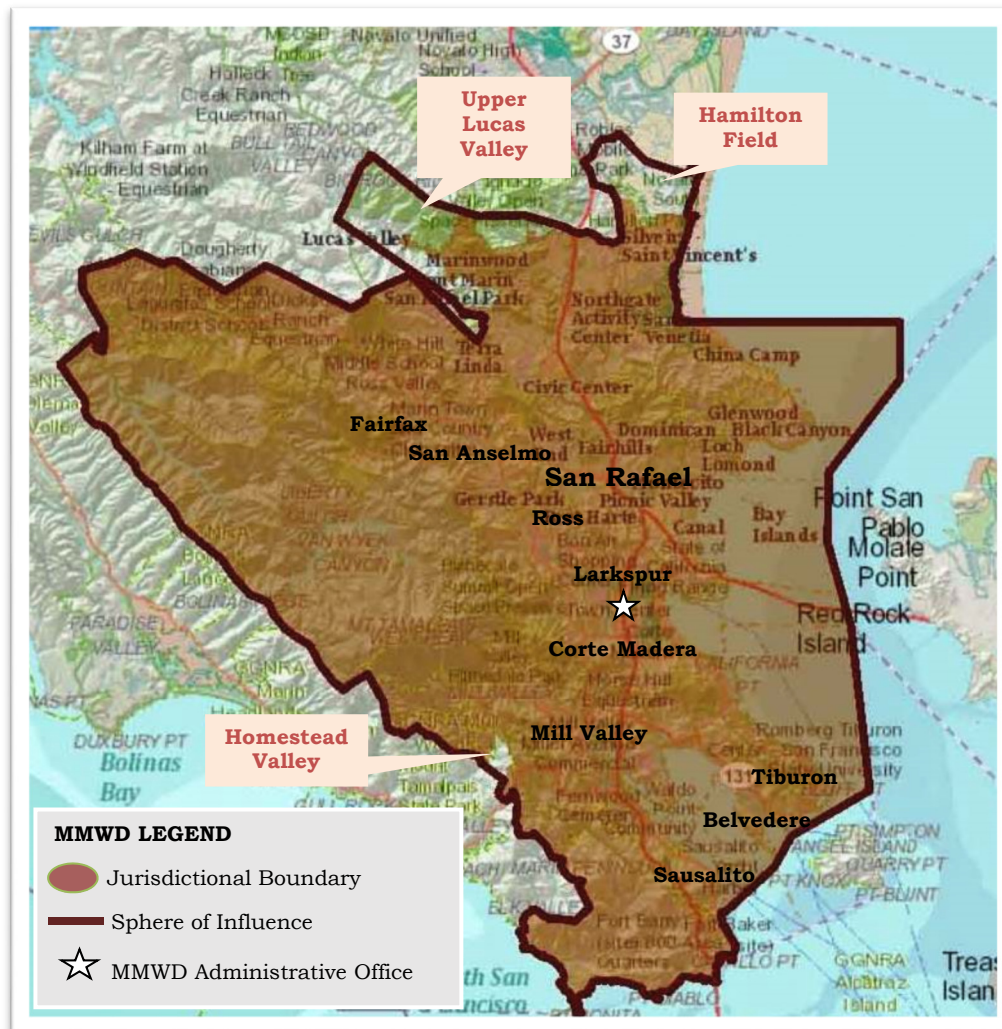
MMWD’s sphere of influence is presently 99,305 acres or 155 square miles in size. The sphere was first established by the Commission in June 1983 and purposely set to include MMWD’s entire jurisdictional boundary along with the addition of approximately 500 acres of non-jurisdictional lands concentrated in two unincorporated areas: (a) Homestead Valley and (b) Upper Lucas Valley. No changes to the sphere have been made since establishment in 1983. The amount of non-jurisdictional land within the sphere, nonetheless has actually increased – albeit inadvertently by all appearances – as a result of the Commission approving a detachment from MMWD of Hamilton Field in Novato in 2002 without a matching sphere reduction.

MMWD’s sphere is close to 96% coterminous with its jurisdictional boundary and presently includes 4,335 non-jurisdictional lands that lie within three distinct areas: (a) Homestead Valley; (b) Upper Lucas Valley; and (c) Hamilton Field.

3.4 Outside Services

MMWD reports it does not provide any potable water services beyond the District’s jurisdictional boundary.

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

MMWD’s resident service population served by the District’s potable water system is estimated by the Commission at 186,048 as of the term of this study period. This estimate is divided between two distinct service segments with 98% lying within local communities and 2% at San Quentin Prison. This estimate also indicates MMWD is at 88.6% with respect to its meeting its jurisdictional boundary’s projected buildout total of 209,907 based on the policies of the

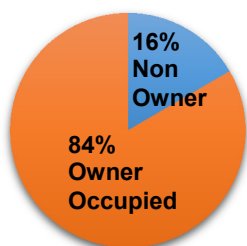
LAFCO estimates there are 186,048 total residents within MMWD explicitly served by the District as of the term of this study. This means MMWD is at 89% of its resident buildout, and not expected to reach buildout until 2180.

11 affected land use authorities.¹⁵⁸ The current resident estimate is based on a modified calculation specific to public water systems and represents a total population growth rate of 0.37% over the study period or 0.07% annually; an amount that is 1.8 times lower than the estimated annual growth rate for the entire county over the same period by the California Department of Finance.¹⁵⁹ MMWD’s estimated resident population represents 73.2% of the countywide population.

With respect to going forward, and for purposes of this review, it is reasonable to assume the growth rate within MMWD will match the preceding five year period with an overall yearly change of 0.07%. The substantive result of this assumption would be an overall increase in MMWD’s resident population of 2,038 and produce a total of 187,399 by 2023. It also indicates – and if this growth rate holds thereafter – MMWD will reach its estimated current-planning resident buildout of 209,907 in the year 2180. These collective projections – past, current, and future – are summarized below.

MMWD: Service Population Estimates					
Table 4-91 (Marin LAFCO)					
Service Segment	2009	2013 -Baseline-	2018	2023	Annual Trend
MMWD – Local	181,361	182,048	182,722	183,399	0.07%
MMMD – State Prison	4,000	4,000	4,000	4,000	0.00%
	185,361	186,048	186,722	187,399	0.07%

4.2 Residency Type



The Commission projects that MMWD’s estimated residential total of 186,048 as of the term of the study period is roughly divided between 155,828 fulltime or owner-occupied residents versus 30,220 part-time or non-owner occupied residents with the accompanying calculation footnoted.¹⁶⁰ This projection is based on a review of current County Assessor records and indicates no less than 84% of MMWD’s residents are presumably year-round.

¹⁵⁸ MMWD’s resident buildout population has been calculated by the Commission and based on multiplying the total number of potential new units identified in the 11 affected land use authorities’ housing elements – 7,230 – that lie within the District by a factor of 3.3. Actual construction is subject to external factors and highlighted by market demands and permit approvals from the affected land use authorities.

¹⁵⁹ California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid option is appropriate specific to MMWD to use the second option and multiply the number of its residential connections – 55,166 – by 3.3 along with adding 4,000 to account for the single service connection tied to San Quentin State Prison to produce 186,048.

¹⁶⁰ This projection has been calculated by the Commission and based on taking the total number of units - 76,410 - assigned to all developed residential lots within MMWD and developing a percentage of those associated units with local ownership addresses - 83.4% - versus those with non-local mailing addresses - 16.3% - and applied to the projected overall population of 186,048 less the residents at San Quentin. The projection does not take into account the potential for non-owner residents (renters) within MMWD.

4.3 Social and Economic Indicators

A review of recent demographic information covering the study period for the communities within MMWD’s jurisdictional boundary – specifically a weighted calculation involving the 10 cities/towns and the 11 census designated unincorporated communities – indicates the District’s service population generally follows countywide norms with two notable exceptions. First, MMWD’s overall service population is statistically more affluent given the average median household income of \$97,400 is 7.1% higher than the countywide average. Second, educational attainment among residents within MMWD is statistically higher by 5.0% than countywide averages as measured by adults with bachelor degrees. Nonetheless, and in contrast to the overall increase in median income, recent trends also show an increasing divide in economic standing as many MMWD customers have experienced a sharp downturn in their personal finances. This includes significant increases in unemployment and poverty rates over the covered period as these economic indicators have risen by 47% and 19%, respectively. A summary of trends in pertinent demographic information for MMWD’s service communities follows.

MMWD’s fulltime constituents are aligned with countywide averages with respect to social and economic indicators with the two statistical significant exceptions: District customers have increasingly higher median household incomes and more formal education. A growing economic disparity, though, has also emerged in which overall median incomes have increased by 5% while unemployment levels have increased by 47%.

MMWD Resident Trends in Social and Economic Indicators				
Table 4-92 (Marin LAFCO / American Communities Survey)				
Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Average
Median Household Income	\$92,635	\$97,400	5.1%	\$90,962
Median Age	44.0	44.1	0.2%	44.6
Prime Working Age (25-64)	57.3%	55.4%	(3.3%)	56.6%
Unemployment Rate (Labor Force)	4.7%	6.9%	46.8%	4.5%
Persons Living Below Poverty Rate	6.4%	7.6%	18.8%	7.5%
Mean Travel to Work	26.0 minutes	28.1 minutes	8.1%	28.4 minutes
Adults with Bachelor Degrees or Higher	58.9%	59.3%	0.7%	54.6%
Male	48.1%	48.3%	0.4%	49.2%
Female	51.9%	51.7%	(0.4%)	50.8%
White / Non-Hispanic	76.8%	73.7%	(4.0%)	73.1%
Hispanic	12.9%	15.0%	16.3%	15.3%
Other	10.4%	11.3%	8.7%	11.6%

Notes to Demographics Table:

- 1) This table reflects a weighted calculation prepared by LAFCO coalescing census data generated for the (a) incorporated communities of San Rafael, San Anselmo, Fairfax, Ross, Corte Madera, Mill Valley, Belvedere, Tiburon, and Sausalito as well as the (b) unincorporated communities of Sleepy Hollow, Kentfield, Lucas Valley/Marinwood, Santa Venetia, Tamalpais Valley, Marin City, Strawberry, Lagunitas, San Geronimo, Woodacre, and Alto.

5.0 Organizational Structure

5.1 Governance

MMWD’s governance authority is codified under California’s Municipal Water District Act of 1911 (“principal act”) and empowers the District to provide a limited purpose of municipal services upon approval by LAFCO. MMWD – which is currently one of 37 municipal water districts currently operating in California – is presently authorized to provide three specific services within its jurisdictional boundary: (a) domestic water; (b) non-potable water; and (c) recreation. All other latent powers enumerated under the principal act would need to be activated by LAFCO before MMWD would be allowed to initiate; similarly divestiture of existing powers would also require prior approval from LAFCO.

LAFCO approval is needed for MMWD to activate a latent power or divest itself from an existing service.

A list comparing active and latent power authorities under the principal act follows.

Active Service Powers

- potable / non potable water
- public recreation

Latent Service Powers

- hydroelectric power
- fire protection
- solid waste/garbage
- storm drainage
- wind/solar power ¹⁶¹

MMWD has been governed since its formation in 1912 as an independent special district. The original governing board composition totaled 13 and was divided between five elected members and eight appointed members from the then seven incorporated communities (Belvedere, Larkspur, Ross, Mill Valley, San Anselmo, San Rafael, and Sausalito) and the County of Marin. The composition was subsequently amended to its current five-member organization with directors elected by electoral district to staggered four-year terms with members receiving a \$145 meeting stipend. MMWD currently meets on the first and third Tuesday at 7:30 P.M. of each month at the District’s Administrative Office at 220 Nellen Avenue in Corte Madera. A current listing of Board members with respective backgrounds and continuous service follows.

MMWD Board Roster			
Table 4-93 (MMWD)			
Member	Position	Background	Years on Board
Jack Gibson	President	Attorney	20
Armando Quintero	Vice President	Educator	5
Larry Bragman	Member	Attorney	1
Cynthia Koehler	Member	Attorney	10
Larry Russell	Member	Engineer	10
Average Years of Board Experience			9.2

¹⁶¹ MMWD’s latent authority to provide wind or solar power subject to LAFCO approval is specific to the District and codified under California Water Code Section 71664.

5.2 Administration

MMWD appoints an at-will General Manager to oversee all District activities. The current General Manager – Krishna Kumar – was appointed by the Board in 2012 and oversees a present budgeted staff of 242 fulltime equivalent employees; the latter of which is divided between six distinct personnel divisions: (a) general manager; (b) legal; (c) finance and administrative; (d) human resources; (e) engineering and environmental services; and (f) facilities and watershed. Legal services are provided by MMWD General Counsel Mary Carey. MMWD’s administrative offices are at 220 Nellen Avenue in Corte Madera.

MMWD Administrative Offices



MMWD Administration

Table 4-94 (MMWD)

General Manager.....	Krishna Kumar
Legal Counsel.....	Mary Casey
Water System Operator.....	Erik Westerman

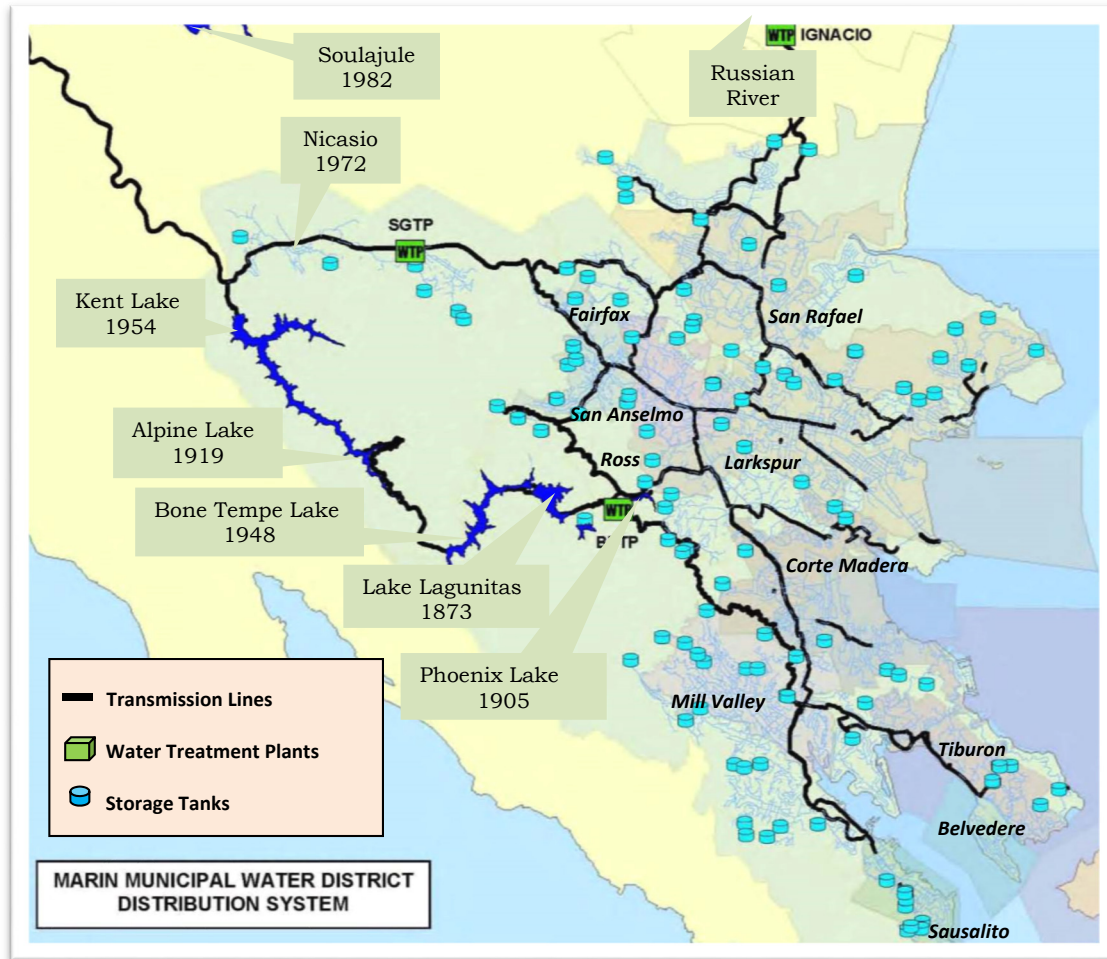
6.0 Potable Water Services

6.1 Service Overview

MMWD directly provides retail potable water services through a combination of its own and contracted supply, treatment, storage, and distribution facilities. MMWD’s own facilities have largely been incrementally expanded through the acquisition of other private utilities beginning shortly after its formation with the purchase of MWPC (San Rafael and Ross Valley areas) and the North Coast Water Company (Mill Valley and Belvedere areas) and supplemented thereafter by over two dozen other transactions.¹⁶² These purchases coupled with its own infrastructure improvements result in MMWD currently operating a single integrated distribution system spanning approximately 890 miles. MMWD also provides non-potable water services to limited areas within its jurisdictional boundary through a separate 24 mile distribution system through a contract with Las Gallinas Valley Sanitary District. A summary review of these non-potable water services are addressed in a succeeding section.

A graphical overview of MMWD’s domestic water system is shown below.

¹⁶² MMWD records show the District has purchased and assumed water service operations for a total of 27 private water companies between 1916 and 1996.



6.2 Supplies

MMWD’s potable water supplies are drawn from a combination of local and imported sources with the former generally accounting for three-fourths of annual uses. These sources – the majority of which have permit or contractual terms – collectively provide MMWD with access to a maximum annual supply of 30.590 billion gallons or 93,866 acre-feet. A summary of these water sources divided between primary (local) and secondary (imported) follows.

MMWD’s maximum annual potable water yield available to the District through its local and imported sources is calculated at 93,866 acre-feet.

Primary Sources

Local surface sources generated from watershed runoff and diverted from three local creeks collectively serve as MMWD's primary potable water supplies. These local sources collectively provide MMWD 25.730 billion gallons or 79,566 acre-feet; amounts that reflect total reservoir capacity. Lagunitas Creek is the principal local supply source and lies on the southwest side of Mount Tamalpais with runoff charging the approximate 38.1 square mile watershed (Lagunitas) and secured through a combination of pre (unrestricted) and post (restricted) 1914 appropriated rights with the State Water Resources Control Board.¹⁶³ MMWD's rights to Lagunitas Creek are effectuated through multiple diversion points that convey water flows by gravity into one of five man-made reservoirs that are located within six miles of each other along the watercourse. These five reservoirs – and in order of their original service date being Lagunitas, Phoenix, Alpine, Bon Tempe, and Kent – were constructed between 1872 and 1979 and collectively provides 15.175 billion gallons or 46,564 acre-feet in total holding capacity.

MMWD's primary potable supply sources are drawn from three local creeks – Lagunitas, Nicasio and Arroyo Sausal. These local surface supplies are accessed from a combination of pre and post 1914 appropriated rights and made available to MMWD through diversions into seven man-made reservoirs with a combined maximum holding capacity or yield of 79,566 acre-feet for any given year.

MMWD's other local surface supply sources are secured through post-1914 appropriated rights to draw water from Nicasio and Arroyo Sausal Creeks. Water flows from Nicasio Creek are generated from runoff within an approximate 36.9 square mile watershed (Nicasio) and diverted by gravity into Nicasio Reservoir and its 7.309 billion gallons or 22,430 acre-foot holding capacity.¹⁶⁴ Water flows from Arroyo Sausal Creek are generated from runoff in an approximate 77.7 square mile watershed (Walker) and diverted by gravity into SoulaJule Reservoir with its 3.4 billion gallons or 10,572 acre-foot holding capacity.¹⁶⁵

The most recent reviewed year-end deliveries from MMWD's three local surface sources totaled 7.0 billion gallons or 21,530 acre-feet. This amount accounted for slightly more than three-fourths of all MMWD supply production in 2013.¹⁶⁶

¹⁶³ MMWD's post 1914 entitlement rights to Lagunitas Creek total 74,685 acre-feet annually.

¹⁶⁴ MMWD's post 1914 entitlement right to Nicasio Creek is dated back to 1956 and totals 51,400 acre-feet.

¹⁶⁵ MMWD's post 1914 entitlement right to Arroyo Sausal Creek is dated back to 1965 and totals 23,235 acre-feet.

¹⁶⁶ Gravity provides diversion and conveyance of raw-water to all seven reservoirs with pumping required out of the reservoirs to their assigned treatment facilities.

Secondary Source(s)

A secondary potable supply source for MMWD is imported from Sonoma County and through an agreement with the Sonoma County Water Agency (SCWA). MMWD and SCWA's eight primary contractors fund the Russian River Project.¹⁶⁷ This agreement provides MMWD with an annual allocation of up to 4.660 billion gallons or 14,300 acre-feet of treated potable water drawn indirectly from the Russian River through specialized filtering wells near Forestville in Sonoma County.¹⁶⁸ (Treatment does not provide fluoridation; this is provided by MMWD upon delivery to the District.) The daily maximum draw to Russian River supplies is restricted to 12.9 million gallons or 39.3 acre-feet. The agreement – which is the result of combing two separate contracts – was originally established in 1975 and revised in 1996. The agreement enables MMWD through a cost-sharing arrangement with SCWA to divert, treat, and convey – or wheel – water from the Russian River through a series of aqueducts and pumps that ultimately spans nearly 40 miles before connecting to the District's distribution system through an intertie with the North Marin Water District.¹⁶⁹ Deliveries from SCWA totaled 1.9 billion gallons or 5,873 acre-feet and accounted for slightly less than one-fourth of all MMWD supply production at the term of the study period.

MMWD's secondary potable supply source is drawn from the Russian River by way of an agreement with SCWA and wheeled through the North Marin Water District. This agreement runs through 2040 and provides MMWD with a maximum annual and daily allocation of up to 14,300 and 39.3 acre-feet, respectively, of pretreated water supplies less fluoride, which is added by the District at the point of receipt in Ignacio.

¹⁶⁷ The Russian River Project was constructed by the United States Army Corps of Engineering with partial funding provided by the County of Sonoma beginning in the 1950s to improve access and reliability to water supplies drawn from the Russian River and its approximate 1,500 square mile watershed. Two public work projects anchor the Russian River Project and are tied to impounding and storing flows for later release as needed. Lake Mendocino was created in 1958 with the construction of the Coyote Valley Dam near the City of Ukiah and has a supply capacity of 68,400 acre-feet. Lake Sonoma was created in 1983 with the construction of the Warm Springs Dam near the City of Healdsburg and has a supply capacity of 245,000 acre-feet.

¹⁶⁸ The agreement specifies MMWD's maximum and daily allowance to the transmission line conveying Russian River to Marin County is 39.3 acre-feet.

¹⁶⁹ MMWD pays a rate equivalent to the highest rate charged to any of the eight primary contractors or the per-acre-foot operation and maintenance charge paid by the parties to the plus a per-acre-foot capital charge of \$96; whichever is greater. MMWD also pays on all deliveries a Russian River Projects Charge and a Russian River Conservation Charge, in lieu of the property taxes paid by water contractors serving Sonoma County residents.

Supply Average

MMWD's average yield or production over the study period from the District's combined primary (local surface creeks) and secondary (imported Russian River) potable supply sources has been 8.643 billion gallons or 26,521.4 acre-feet.¹⁷⁰ The single-highest year-end use over the last five years occurred in 2009 when MMWD collectively drew 9.062 billion gallons or 27,807 acre-feet; an amount that modestly exceeded the average annual take during this period by 5.0% and divided between 71.7% primary and 28.3% secondary sources.

MMWD's average annual potable water yield over the study period has been 26,521 acre-feet; an amount that is 28.3% of the maximum yield available to the District.

Supply Reliability

The majority of MMWD's potable water supplies – on recent average 76% – is locally sourced by way of three local waterways and provides a relatively reliable primary source given it is directly overseen and managed by the District.¹⁷¹ The reliability of this primary source is further and significantly enhanced by MMWD's investment in watershed management to protect against adverse encroachment and related impacts on water quality. This includes MMWD owning 18,900 acres or 77.5% of the approximate 38.1 square mile watershed (Lagunitas) that collects runoff from Mount Tamalpais and charges the District's principal local water source, Lagunitas Creek. MMWD has also purchased 2,735 acres within the associated watersheds supplying the District's other two local waterways, Nicasio and Arroyo Sausal Creeks, respectively. These latter two waterways are also made substantively more reliable by way of protection from adverse encroachment given approximately 80% of the lands are under Williamson Act contracts and/or conservation easements with the Marin Agricultural Land Trust; all of which suggest water flow in-and-of-themselves is not likely to be adversely impaired.¹⁷² Furthermore, the intensity of the agricultural uses also appears relatively light in these watersheds and presumably helps avoid significant impacts on water quality going

The reliability of MMWD's primary potable water supplies is measurably enhanced given two related factors that protect against encroachment and related impacts on water quality. First, 78% of the watershed lands charging the Lagunitas Creek are under the direct ownership and management of MMWD. Second, 80% of the watershed lands charging the Nicasio and Arroyo Sausal Creeks are under a Williamson Act or MALT contract. Climate change remains the primary threat to the reliability of these local surface sources going forward.

¹⁷⁰ Water yield totals are drawn from MMWD's Comprehensive Annual Financial Report for 2013-2014.

¹⁷¹ The estimated average of 76% of MMWD water production being locally sourced is based on actual metered production between 2009 and 2013.

¹⁷² Estimates are based on data extracted from MarinMap.

forward. The lone – albeit significant – constraint on all three local water supplies is climate change effecting runoff patterns and increasing salt intrusion with the latter particularly pertinent for Soulajule and Nicasio Reservoirs.

The remainder of MMWD’s water supplies – on recent average 24% – are imported from Sonoma County and tied to a contractual relationship with externally prescribed terms and conditions. This contractual relationship means MMWD is proportionally dependent on a separate governing body – SCWA – in managing resources now and into the future to help ensure annual water allocations to the Russian River Project are available to meet a quarter of demands within the District. This contractual relationship also requires dependency on other third-party agencies that contract with SCWA to abide by capacity allowances with the underlying conveyance system – such as City of Petaluma and NMWD as the immediate wheelers of the supplies – to avoid adversely impacting MMWD and its ability to access allocations in a consistent and timely manner. MMWD imports water mostly during non-summer months when there is adequate capacity in SCWA’s aqueduct. Last, though not an immediate issue, MMWD’s contract with SCWA for annual water allocations is set to expire no later than 2040 and there are no certainties with respect to delivery amounts thereafter.

In 2011, as required under State law, MMWD published an update to its Urban Water Management Plan (UWMP) to guide long-term planning to match projected demands with supplies.¹⁷³ The UWMP identifies MMWD’s service population as of 2010 at 190,600 based on demographic information published by the Association of Bay Area Governments (ABAG) with a corresponding total annual water demand of 25,981 acre-feet; the latter equating to an estimated 146 gallons a day per connection. The UWMP projects rises in both MMWD’s customers and demands with overall increases in these categories totaling 7.0% and 9.2%, respectively, by 2035.¹⁷⁴ The UWMP also projects water supplies under normal, dry-year, and multiple-dry year conditions relative to estimated demands through 2035, and concludes MMWD ultimately can meet projected needs with the assumption of aggressive conservation when needed. This includes anticipating a one-fourth decrease in demands – equal to 7,642 acre-feet – from normal conditions to single-dry year conditions to match expected curtailment in available supplies.¹⁷⁵

¹⁷³ The Urban Water Management Planning Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections and/or supplying more than 3,000 acre-feet of water annually to adopt and submit a plan every five years to the California Department of Water Resources.

¹⁷⁴ The UWMP projects the District’s water demands and service population will reach 28,381 acre-feet and 204,000, respectively, by 2035.

¹⁷⁵ MMWD uses the 1977 water year as its baseline in projecting single-dry year supplies.

As referenced in the preceding paragraph, the UWMP orients MMWD to anticipate an overall reduction of nearly three-fourths in the District’s supplies during single-dry or significant drought year conditions relative to normal/maximum conditions. This includes MMWD calculating specific reductions in single-dry year periods equaling 46.9% in its primary water sources (local surface) and 76.8% in its secondary source (Russian River) relative to normal/maximum conditions; the end and cumulative result being that total supplies reduce from 93,866 to 21,626 acre-feet and a loss of (72,240) acre-feet. These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by LAFCO for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%. The following table summarizes MMWD’s water supply sources relative to right/permit allowance, normal year conditions, and single-year drought year conditions.

MMWD projects an overall decrease in annual potable water supplies to 26,134 acre-feet during a significant drought year event based on applying conditions from 1977. This projection represents a 72% decrease in supplies relative to the maximum yield available to MMWD.

MMWD’s Potable Water Supply Availability						
Listed in Acre-Feet Table 4-95 (Marin LAFCO / MMWD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To MMWD	Convey Year Max To MMWD	76-77 Drought Day Max To MMWD	76-77 Drought Year Max To MMWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
SCWA / Russian River	39.3	14,300.0	39.3	14,300.0	20.8	7,600.0
Alpine Reservoir - Lagunitas Creek	99.2	74,685.0	41.1	8,891.0	4.9	1,778.2
Bon Tempe Reservoir - Lagunitas Creek	---- above ----		--- above ---	4,017.0	---- above ---	1,164.9
Kent Reservoir - Lagunitas Creek	--- above ---		25.6	32,895.0	26.1	9,534.0
Lagunitas Reservoir - Lagunitas Creek	--- above ---		0.1	350.0	0.8	101.5
Phoenix Reservoir - Lagunitas Creek	--- above ---		11.9	411.0	0.3	119.2
Nicasio Reservoir - Nicasio Creek	61.5	51,400.0	61.5	22,430.0	12.3	4,500.0
Soulajule Reservoir - Arroyo Sausal	59.5	23,235.0	51.3	10,572.0	3.7	1,336.2
Total Yield	259.5	163,620.0	230.8	93,866.0	68.9	26,134.0

MMWD Reports the Combined Runoff for the District’s Local Reservoirs Averages 84,800 Acre-Feet

Total Calculated by MMWD to Parallel 1977; Individual Subtotals Estimated by LAFCO Staff

Notes to Water Supply Table:

- 1) MMWD reports in its 2010 UWMP the combined annual runoff for the District's local reservoir system has ranged in volume from maximum of 220,000 acre-feet to 4,100 acre-feet (1977) based on flow data collected between 1928 and 2009. The combined average annual runoff is 84,800 acre-feet.
- 2) MMWD's maintains both pre and post 1914 appropriated diversion rights to Lagunitas Creek. The post 1914 rights collectively provide MMWD the ability to divert up to 74,685 acre-feet per year with a daily limit of 99.2 acre-feet. LAFCO is relying on the post-1914 permit allowances in quantifying the availability of supplies from Lagunitas Creek for purposes of this review.
- 3) MMWD maintain only post 1914 appropriated diversion rights to Nicasio and Arroyo Sausal Creeks.
- 4) MMWD's agreement with SCWA for annual allocations from the Russian River terms in June 2040.
- 5) The pump stations assigned to the Nicasio Reservoir to convey raw water to San Geronimo Water Treatment Facility have a combined daily pump rate of 97.8 acre-feet and exceeds the post-1914 permit allowance that sets the daily maximum withdraw to 61.5 acre-feet. Accordingly, the normal/maximum conditions reflect the 61.5 acre-feet daily amount. The other pump stations tied to conveying water from local reservoirs to their assigned water treatment facility produce amounts less than the associated post-1914 permit allowance and reflected in the middle column.
- 6) Water supplies from the Russian River are contractually defined as an allocation and are subject to specified restrictions, including proportional reductions in deliveries due to low storage supplies.
- 7) Drought year conditions reflect a 76.8% reduction compared to normal/max year conditions for local surface supplies and based on recorded runoff during the 1977 water year. A similar reduction in the amount of 46.9% is applied to supplies contracted from SCWA for allocations to the Russian River.

6.3 Water Treatment Facilities

Local Sources

MMWD treats all raw water received from its three local surface sources at one of two water treatment plants (WTP) that apply nearly identical processes before finished water enters the distribution system. The Bon Tempe WTP lies northwest of Ross and operates year-round unless down for maintenance and can process all water drawn from the Lagunitas Creek and held at Alpine, Bon Tempe, Kent, Lagunitas, and or Phoenix Reservoirs. The Bon Tempe WTP was built in 1959 and commences treatment as suspended matter is removed in clarifiers, microscopic particles are removed in deep-bed, multi-media filters, and bacteria and pathogens are inactivated by disinfectants. The water is then treated to control corrosion before fluoride is added.¹⁷⁶ The treatment process concludes with finished water settling into an adjacent

MMWD treats all raw water collected from its local surface sources at its Bon Tempe (Ross) and San Geronimo (Woodacre) WTPs. These facilities' combined daily capacity if run continuously is 132 acre-feet and equals 70% of the total amount of raw water MMWD can draw from these local surface supplies on any given day.

2.0 million gallon or 6.1 acre-feet clearwell tank to complete the necessary contact time

¹⁷⁶ MMWD began fluoridating its potable waters supplies in 1973 as a result of a successful voter initiative ("Measure B") passed in November 1972 and later affirmed in 1978 ("Measure D"). State law was later amended in 1995 as a result of Assembly Bill 733 to require all public water service providers in California with more than 10,000 service connections to fluorinate water supplies with limited exceptions.

with chorine before entering the distribution system. The Bon Tempe WTP capacity is 12,500 gallons a minute and *if* run continually results in a daily maximum total of 18.0 million gallons or 55.2 acre-feet (emphasis). This daily treatment capacity equals 70.1% of the 78.7 acre-feet of water that can be drawn on a given day from Lagunitas Creek.

The San Geronimo WTP lies in Woodacre and operates year-round and can process water drawn from Nicasio and Arroyo Sausal Creeks and held at the Nicasio and Soulajule Reservoirs. (It can also treat water from Lagunitas, Bon Temple, Alpine, and Kent Reservoirs if needed.) The San Geronimo WTP was built in 1961 and provides treatment consistent with Bon Tempe before finished water settles in an adjacent 5.0 million gallon or 15.3 acre-feet clearwell tank to complete the necessary contact time with chlorine before entering the distribution system. The San Geronimo WTP capacity is 17,360 gallons a minute and *if* run continually results in a daily maximum total of 25.0 million gallons or 76.7 acre-feet (emphasis). This daily treatment capacity equals 70.0% of the 112.8 acre-feet of water that can be collectively drawn on any given day from Nicasio and Arroyo Sausal Creeks.

Imported Supplies

MMWD’s remaining water supplies contracted from SCWA are delivered pretreated with respect to having been filtered and disinfected. The contracted water from SCWA is received by MMWD at its Ignacio WTP in Novato at which time the District completes a supplemental treatment process by adding fluoride before the finished water enters the distribution system. The Ignacio WTP was built in 1977 with a capacity to process up to 1,100 gallons a minute, and *if* run continually process a daily maximum total of 16.0 million gallons or 49.1 acre-feet (emphasis). This daily treatment capacity exceeds the 39.0 acre-feet allocation MMWD is under contract to receive for a given day from SCWA.

MMWD’s Water Treatment Facilities		
Table 4-96 (MMWD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Bon Tempe - Lagunitas Creeks	n/a	18,000,000 gallons / 55.2 acre-feet
San Geronimo - Nicasio / Arroyo Sausal Creeks	n/a	25,000,000 gallons / 76.7 acre-feet
Ignacio - Russian River	n/a	16,000,000 gallons / 49.1 acre-feet
Total		59,000,000 gallons / 181.0 acre-feet

6.4 Water Quality

MMWD's most recent water quality report for production from all three WTPs during the study period was issued in June 2014 and covers sample testing for the 2013 calendar year. The report is divided into testing for both primary and secondary contaminants for treated water as prescribed by the Department of Public Health (DPH); the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found. No actions were required by DPH.¹⁷⁷

MMWD's last water quality report for the study period shows no excessive primary or secondary contaminants and required no actions by DPH.

6.5 Distribution System and Storage Facilities

MMWD's potable water distribution system consists of approximately 890 miles of mains and overlays 21 service areas with 150 individual pressures zones that jointly cover a 920 foot range in elevation between service connections.¹⁷⁸ Segments of the distribution system were originally built in the 1870s by the immediate predecessor to MMWD – Marin Water and Power Company – before its phased replacement by the District beginning in the 1916. The distribution system principally relies on gravity pressure for recharge from 132 potable storage tanks that range in service date from 1902 to 2013 and collectively holds 81.7 million gallons or 250.9 acre-feet; the latter amount equaling more than three times the current average day demand. There are also 95 pump stations connected to the distribution system conveying water from lower to higher service areas and individual zones and triggered when operating storage levels fall below a designated level.

MMWD's potable storage capacity within the distribution system totals 250.9 acre-feet and can accommodate up to 2.3 days of average peak-day demand totals over the study period.

Finished water enters MMWD's distribution system at three separate locations from the District's WTPs through 42-inch transmission mains into nine connected low-lying gravity zones. Total transmission capacity to the distribution system from all three WTPs equals 57.6 million gallons or 176.7 acre-feet; an amount that represents 97.6% of the total combined capacity of MMWD's three WTPs.

A summary of the transmission pump capacities from all three WTPs follows.

¹⁷⁷ California Government Code Section 56430(c) directs LAFCOs to verify the status of public agencies' conformance with water quality drinking standards as part of the municipal service review.

¹⁷⁸ Peak elevation in MMWD's distribution system is approximately 920 feet above sea level in the Mill Valley area.

- Finished water from the Bon Tempe WTP enters the distribution system west of Ross and pumped into Ross Valley through its “Southern Marin” line that ultimately extends to Sausalito. The associated transmission pump has a flow capacity of 12,000 gallons per minute and if run continuously produces a daily maximum supply of 17.2 million gallons or 53.0 acre-feet.
- Finished water from the San Geronimo WTP enters the distribution system in Woodacre and pumped into Lucas Valley and northwest San Rafael through its “San Geronimo” line. The associated transmission pump has a flow capacity of 17,000 gallons per minute and if run continuously produces a daily maximum supply of 24.4 million gallons or 75.1 acre-feet.
- Finished water from the Ignacio WTP enters the distribution system in Marinwood and pumped into northern San Rafael through its “North Marin” line. The associated transmission pump has a flow capacity of 11,000 gallons per minute and if run continuously produces a daily maximum supply of 15.8 million gallons or 48.6 acre-feet.

Once in the distribution system, treated water from all three WTPs becomes comingled within MMWD’s nine low-lying gravity zones that serve the State Highway 101 corridor from Marinwood to the north and Sausalito to the south. The gravity zones collectively represent approximately 80% of MMWD’s total service connections. Projected water demands within these gravity zones is similarly estimated at 77% relative to overall usage and presently equals 18.8 million gallons or 57.8 acre-feet in current average day demand. The total storage capacity in these gravity zones is 38.6 million gallons or 118.5 acre-feet, and exceeds the combined estimated peak-day demand of 82.0 acre-feet. The remaining 20% of MMWD’s service connections lie within twelve high-lying pump zones. Projected water demands within these pump zones are similarly estimated at 23% of overall usage and presently equals 5.6 million gallons or 17.3 acre-feet in current average day demand. The total storage capacity in these pump zones is 43.1 million gallons or 132.2 acre-feet, and exceeds the combined estimated peak-day use total of 24.5 acre-feet.

MMWD’s Treated Storage Tanks				
Table 4-97 (Marin LAFCO / MMWD)				
Service Zone	% of Connections	Estimated Avg. Day Use	Primary Service Areas	Storage Capacities
Low-Lying – Gravity Zones	80	18.8 million gallons or 57.8 acre-feet	Lucas Valley North/Central San Rafael Ross Valley	38.6 million gallons or 118.5 acre-feet
High-Lying – Pump Zones	20	5.6 million gallons or 17.3 acre-feet	Southern San Rafael West Mill Valley West Tamalpais Valley	43.1 million gallons or 132.2 acre-feet
Total:				81.7 million gallons or 250.9 acre-feet

Notes to Treated Storage Tanks Table:

- 1) The estimated percent of connection and average daily use within the two service zones (low-lying and high-lying) are based on LAFCO staff applying baseline factors drawn from MMWD’s Pump and Tank Update Report (October 2005).

6.6 Service Connections

MMWD serves 61,391 potable water service connections as of the term of this study period and divided between 55,166 (90.0%) residential and 6,225 non-residential (10.0%). Connections have been relatively stagnant over the last five year period and have only modestly increased in total by 482 or 0.8%. This increase is divided between a 4.7% rise in non-residential connections compared to only a 0.4% rise in residential connections. MMWD reports none of the 61,391 connections lie outside the District.

Trends in MMWD’s Water Connections						
Table 4-98 (MMWD)						
Category	2009	2010	2011	2012	2013	5-Year Change
Residential	54,958	55,015	55,769	55,769	55,166	0.37%
Non-Residential	5,945	6,046	5,497	5,497	6,225	4.71%
	60,909	61,061	61,266	61,266	61,391	0.79%

6.7 System Demands

MMWD’s average annual potable water demand production (metered and losses) over the **study period** has been 8.6 billion gallons or 26,521 acre-feet (see footnote 37).¹⁷⁹ The most recent completed year showed total demand at 8.9 billion gallons or 27,403 acre-feet. This most recent amount represents an average daily water demand production for the entire distribution system of 24.4 million gallons or 75.1 acre-feet; an amount that is further broken down to 399 gallons per day for every active service connection. Per capita use has similarly decreased in step with connections with a study period average of 127 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 106.5 acre-feet and was one-half greater than annualized daily average and results in a peaking factor of 1.53.

The average annual potable water demand production within the MMWD system over the study period has been 26,521 acre-feet and translates to 387 gallons per day for every active connection. The average per resident daily water usage over the last five years has been 127 gallons. Overall water demands during this period have decreased by (1.6%) despite a corresponding 0.1% increase in service population.

¹⁷⁹ Demand includes overall production and incorporates both sales and non-sales (line flushing, system losses, etc.).

With respect to trends, MMWD has experienced an overall decrease of (1.6%) in potable water demand production over the study period or (0.3%) annually. This overall decrease in water demands has been accomplished irrespective of a corresponding projected increase in service population within MMWD’s distribution system over the same time period of 0.07% annually. This overall decrease in usage appears largely attributed to ongoing investment in conservation, highlighted by rebate programs for high-efficiency plumbing fixtures and offering free site consultation visits to implement water-wise uses. Peak-day demands have also decreased – and to a greater degree – from 115.9 to 106.5 acre-feet or (8.1%).

LAFCO projects MMWD’s annual potable water demands will decrease by (1,756) acre-feet or (6.4%) to 25,650 acre-feet by 2023; a further deintensification of more than double relative to the last five year trend and results in daily usage declining to 122 gallons per resident by 2023.

The following table summarizes overall system production over the last five years.

Past/Present Trends in MMWD’s Potable Water Demands							
Table 4-99 (Marin LAFCO / MMWD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	27,807	25,495	25,568	26,332	27,403	26,521	(1.6%)
Average Day	76.2	69.8	70.0	72.1	75.1	72.6	(1.4%)
Connections	60,903	61,061	61,266	61,266	61,391	61,177	0.8%
Per Day Connection	408g	373g	372g	384g	399g	387 gallons	(1.7%)
Per Day Resident	134g	123g	121g	125g	132g	127 gallons	(1.5%)
Peak Day	115.9	108.9	110.5	106.2	106.5	109.6	(8.1%)
Peaking Factor	1.52	1.56	1.58	1.47	1.42	1.51	(6.8%)

Year Amounts Shown in Acre Feet Unless Stated Otherwise

Going forward – and specifically for purposes of this study – it appears reasonable to assume MMWD’s potable water demands will generally follow trends exhibited over the last five years. It is estimated, and using linear regression to control for variances in the most recent year-end totals, MMWD will experience an overall decrease in water demand of 1,756 acre-feet over the next 10 years to 2023; a difference of (6.4%) or (0.64%) annually and a decrease in acceleration by more than double relative to the last five-year period. This estimate also projects an ongoing and sizeable decrease in demands per capita from 132 gallons to 122 gallons or (7.6%) through the next 10 years. It is also estimated MMWD’s peak-day demands will trend consistently with recent amounts and the current five year average peaking factor of 1.51 – which incorporates recent variances as is – will hold through 2023. The following table summarizes these Commission projections over the next 10 years for the MMWD system.

LAFCO Projected Trends in MMWD’s Potable Water Demands

Table 4-100 (Marin LAFCO)

Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	27,403.0	26,215.6	26,074.1	25,931.9	25,789.8	25,646.9	(6.4%)
Average Day	75.1	71.8	71.4	71.0	70.7	70.3	(6.4%)
Peak Day	106.5	108.4	107.8	107.2	106.7	106.2	(0.3%)
Connections	61,391	61,588	61,785	61,983	62,181	62,380	1.6%
Per Day Connection	399g	380g	377g	373g	371g	367g	(8.0%)
Residents	186,048	186,317	186,587	186,858	187,128	187,128	0.6%
Per Day Resident	132g	126g	125g	124g	123g	122g	(7.6%)

*Year Amounts Shown in Acre Feet Unless Provided Otherwise
 “g” refers to gallons*

Notes to LAFCO Projected Trends in Water Demands:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2009 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 1.51 ratio over average day demands based on recent five year trend.

6.8 Infrastructure Capacities to Demands

MMWD’s potable water system is generally operating with available capacities in supply, storage, and treatment in accommodating average demands generated over the study period within the District and no immediate infrastructure deficiencies are identified. These capacities are also generally expected to sufficiently accommodate anticipated demands over the next 10 years, and aided prominently by a projected decrease in usage of 0.6% annually based on recent trends; the net result being a projected savings of 1,756 acre-feet by 2023. Exceptions, nonetheless, exist and highlighted by noting annual water supplies under the Commission’s projected single-dry year drought conditions exceed capacity by (1,269 acre-feet) or (4.9%). This referenced deficit is also reflected in peak-day demands showing a current shortfall of (37.6 acre-feet) or (54.6%) relative to available new water supply production under projected single-dry year drought conditions; all of which places greater importance on storage to meet high-use periods and the need for additional capacity within the Ross Valley service zone.

The following statements summarize and quantify existing and projected relationships between MMWD’s capacities and demands now and going forward to 2023 relative to potable supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand.

Water Supply:

- Average annual water production demands generated over the study period represent 28% of MMWD’s projected accessible sources under normal conditions. This ratio is expected to decrease to 27% by 2023.

Annual Ratios

Annual Ratios

- Average annual water production demands generated over the study period represent 101% of MMWD's projected accessible sources under projected single dry-year conditions – resulting in a (1%) deficit. This ratio is expected to decrease to 98% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 48% of the new daily supply available to MMWD under normal conditions. This ratio is expected to decrease to 46% by 2023.
- Average peak-day water production demands over the study period represent 159% of the new daily supply available to MMWD under projected single dry-year conditions – or a deficit of (59%). This ratio is expected to decrease to a deficit of (54%) by 2023

Water Treatment:

- Average peak-day water production demands generated over the study period represent 61% of MMWD's existing potable treatment capacities. This ratio is expected to decrease to 59% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 44% of MMWD's existing potable storage capacity. This ratio is expected to decrease to 42% by 2023.
- MMWD's two service zones – low and high – have adequate total potable storage in meeting their proportional share of the District's peak day demand averages over the study period. No substantive change in these ratios is projected going forward through 2023.
- Irrespective of the preceding statement, individual service zones within MMWD require additional storage capacity to meet their proportional share of peak-day demands averages now and going forward towards 2023. Additional storage needs are most pertinent for Ross Valley – the largest service zone in MMWD – where existing storage capacity totals 5.8 million gallons and falls short of the area's projected peak-day demand of 8.5 million; a difference of (47%).
- MMWD's total potable storage capacity would allow the District to accommodate up to 2.3 consecutive days of current peak-day demands without recharge. This capacity is projected to slightly increase to 2.4 days by 2023.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 within MMWD is provided below.

MMWD's Capacity Relative to <u>Current</u> Demands			
Table 4-101 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply ...normal conditions	✓		
...single-dry year conditions			✓
Water Treatment	✓		
Water Storage	✓		

MMWD's Capacity Relative to <u>Projected</u> Demands by 2023			
Table 4-102 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply ...normal conditions	✓		
... single-dry year conditions		✓	
Water Treatment	✓		
Water Storage	✓		

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

MMWD primarily relies on two distinct billed bi-monthly charges to fund the District's potable water system in terms of covering both administrative and operations: (a) service and (b) usage. The service charge is fixed based on meter size and intended to contribute towards billing, conservation, and other administrative functions. The service charge presently assigns a bi-monthly charge of \$21.53 for most single-family residential users.¹⁸⁰ The usage charge is tiered and adjusts seasonally based on usage occurring either between December and May (lower demand) or June and November (higher demand). The usage charge presently applies an escalating charge for higher consumption and intended to cover operating costs and related improvements involving supplies, distribution, and treatment. The usage charge currently results in the average residential customer paying \$164.56 bi-monthly between December and November and \$199.71 bi-monthly between June and November. The cumulative cost

The average residential customer in MMWD's system is paying \$1,222 annually in direct water charges based on a daily use of 399 gallons per connection. This produces an approximate ratio of \$0.84 for every 100 gallons.

¹⁸⁰ The \$21.53 bi-monthly service charge is based on residential connections no larger than ¾ inches.

for most MMWD customers is \$1,222 annually and results in a per 100 gallon equivalent charge of \$0.84 based on rates as of January 2015 and average uses generated during the study period.

MMWD also collects a connection fee for new customers. The connection fee for a typical single-family residential structure is presently set at \$29,260.

7.0 Agency Finances

7.1 Financial Statements

MMWD prepares financial statements for each fiscal year utilizing the services of a certified public accounting firm. The financial statements are done at the end of the fiscal year on an accrual accounting basis and identify MMWD’s total assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing MMWD’s short and long-term fiscal health.

MMWD’s most recent financial statements prepared during the study period were issued for 2012-2013 and prepared by Badawi and Associates (Oakland). These audited statements show MMWD experienced a positive change to its fiscal standing over the preceding 12 months as its overall equity or fund balance increased by 3.5% from \$297.643 to \$308.346 million. This increase in the overall fund balance appears directly tied to an operating surplus that was facilitated by a 6% increase in water usage charges following the implementation of a rate increase the prior year. A summary of year-end totals and corresponding trends over the last five years are show in the following tables.

MMWD / 2012-2013 Financial Statements	
Assets	\$461.314 m
Liabilities	\$152.968 m
Equity	\$308.346 m

Agency Assets

MMWD’s audited and overall assets at the end of 2012-2013 totaled \$461.314 million and have increased over the preceding five year period by more than one-quarter. Assets classified as current with the expectation they could be liquidated within a year represented close to one-fourth of the total amount with the majority tied to cash and investments and have doubled. Assets classified as non-current represented the remaining three-fourths, with the largest portion associated with various capital assets with the single largest valued item being the water distribution system at \$188.374 million after depreciation and equal to 54.5% of the total.

MMWD Assets Study Period						
Table 4-103 (Marin LAFCO / MMWD)						
MMWD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Assets	57.154	67.500	60.394	112.987	115.470	102.0
Non-Current Assets	299.280	318.200	327.594	334.163	345.844	15.6
	\$356.434	\$385.700	\$387.989	\$447.150	\$461.314	29.4%

amounts in millions

Agency Liabilities

MMWD’s audited and overall liabilities at the end of 2012-2013 totaled \$152.968 million and have increased by 114% over the preceding five year period. Current liabilities representing obligations owed within a year accounted for a little more than one-tenth of the total amount and are primarily tied to accounts payable and loan repayments with the overall trend slightly decreasing by (5.1%) due to lower interest payments. MMWD’s non-current liabilities make up the remaining 90% and are primarily tied to long term loan repayment and highlighted by \$116.350 million in revenue bonds issued by the District in 2010 and 2012. The 2010 revenue bonds totaled \$31.8 million and issued for various capital improvements to the water system and conservation programs. The 2012 revenue bonds totaled \$85.0 million and were also issued for capital improvements along with paying off earlier debts issued in 2002 in order to secure a lower interest rate.

MMWD Liabilities Study Period						
Table 4-104 (Marin LAFCO / MMWD)						
MMWD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Current Liabilities	20.759	14.900	18.024	16.102	19.690	(5.1)
Non-Current Liabilities	50.716	84.000	79.809	133.405	133.277	162.8
	\$71.475	\$98.900	\$97.833	\$149.507	\$152.968	114.0%

amounts in millions

Agency Equity / Net Assets

MMWD’s audited equity or net assets at the end of 2012-2013 totaled \$308.346 million and represent the difference between the District’s total assets and total liabilities. The total amount has increased by 8.2% over the preceding five year period and generally tied to capital investments in the distribution system. The end of year equity amount incorporates a \$38.923 million or 12.6% in unrestricted funds that has increased by slightly more than one-tenth over the preceding five year period and attributed to increase in general revenues.

MMWD’s unrestricted fund balance total of \$38.9 million equates to a per capita reserve amount of \$209 as of the term of the study period.

MMWD Equity Study Period						
Table 4-105 (Marin LAFCO / MMWD)						
NMWD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	Trends
Unrestricted	34.169	9.000	13.122	30.377	38.923	13.9
Restricted	6.845	4.000	3.855	4.684	2.483	(63.7)
Capital	243.945	273.800	273.186	262.581	266.939	9.4
	\$284.959	\$286.800	\$290.155	\$297.643	\$308.346	8.2%

amounts in millions

7.2 Liquidity, Capital, and Profitability

A review of the financial statement issuances by MMWD covering the study period shows the District generally improved its economic standing and marked by a sizeable gain in liquidity along with regaining profitability. This includes MMWD expanding the value of near-term assets over near-term liabilities by 113% and finishing the review period with sufficient resources to cover immediate debts – like payroll and interest payments – by a ratio of over four-to-one. MMWD also incrementally eliminated an operating deficit by the end of the five year period with the aid of the District enacting an 6% increase in new user rates beginning in 2012. MMWD did experience, though, a significant decrease in capital as a result of new long-term debt obligations and marked by increasing its debt-to-equity level by 143% and finishing the period with 0.43 cents of debt for every 1.00 dollar in equity.

A summary of year-end liquidity, capital, and operating margin ratios for MMWD as of July 1, 2013 are show in the following table.

Study Period Trends in MMWD Liquidity, Capital, and Margin			
Table 4-105 (Marin LAFCO)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	2.753	0.178	(7.24)
2009-2010	4.530	0.292	(8.08)
2010-2011	3.350	0.275	0.08
2011-2012	7.016	0.449	4.50
2012-2013	5.864	0.432	10.23
Averages	4.7030 to 1	0.3256	(0.10%)
Trends	113%	142.9%	(241.3%)

7.3 Pension Obligations

MMWD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. MMWD maintains two contract types for employee pensions based on the date of hire. The formula “tiers” range from a high of 2.7% at 55 to the current and low of 2.0% at 62 with the latter providing an eligible retiree with 20 years of total service credit 40% of their highest year-end salary beginning at age 62.

MMWD’s Defined Pension Benefit Tiers	
Table 4-106 (Marin LAFCO / CalPERS)	
Category	Miscellaneous
Tier One (Pre January 2013)	2.7% at 55
Tier Two (Post January 2013)	2.0% at 62

Note:

All tiers provide a 2.0% cost-of-living adjustment

Funding contributions for MMWD is based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arraignments between the District and its employees. A listing of recent and planned minimum contribution rates for MMWD as determined by CalPERS along with enrollee information follows.

MMWD's Minimum Contribution Rates to CalPERS					
Table 4-107 (Marin LAFCO / CalPERS)					
11-12	12-13	13-14	14-15	15-16	Trend
18.2%	18.5%	20.9%	24.69%	26.9%	47.80%
<i>Projected</i>					

MMWD's Pension Enrollee Information	
Table 4-108 (CalPERS)	
Enrollee Type	As of June 30, 2013
Active.....	227
Transferred.....	47
Separated.....	50
Retired.....	289

MMWD's total annual pension liability is on the rise based on available information spanning the 2010-2011 to 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. This includes MMWD's unfunded liability – pension monies owed that are not covered by assets – rising from \$55.790 to \$61.944 million over the span of the three affected fiscal years and exceeding the corresponding inflation factor for the San Francisco Bay area region during this period of 5.0% by over two-fold at 10.9%. This rise in pension liability also shows itself in MMWD's funded status – the difference between the pension plan's assets and liabilities – during this window with the current ratio at 67.6% (market) and 77.0% (actuarial). MMWD's worker-to-retiree ratio has also decreased by nearly one-fifth over the three-year period from 0.93 to 0.78; all of which means it is reasonable to assume employer and employee contributions will need to increase going forward to simply maintain existing debt levels.

MMWD's unfunded pension liability has increased over the last three reported years and currently totals \$61.944 million; an amount surpassing the District's current unrestricted fund balance of \$38.923 million by nearly 60%. MMWD's worker-to-retiree ratio has also decreased and current at 0.78.

MMWD Trends in Pension Measurements				
Table 4-109 (Marin LAFCO / CalPERS)				
Category	2010-2011	2011-2012	2012-2013	Difference
MMWD Annual Contribution	\$22.384 million	\$19.529 million	\$20.291 million	(9.4%)
Funded Ratio – Market	68.2%	64.3%	67.6%	(0.9%)
Unfunded Liability - Market	\$55.790 million	\$64.656 million	\$61.944 million	10.9%
Funded Ratio – Actuarial	76.5%	77.0%	n/a	0.6%
Unfunded Liability -Actuarial	\$41.241 million	\$41.665 million	n/a	1.0%
Active to Retiree Ratio - active employee for every retiree	0.93	0.81	0.78	(16.1%)

Notes:

- 1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now). Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.)

7.4 Revenue and Expense Trends

MMWD has experienced overall revenue surpluses – and this includes operating and non-operating sources – in each year of the study period with an average net of \$5.089 million or 8.3%. Average year-end revenues over this period have totaled \$65.9 million with nearly 84% of this amount drawn from bimonthly water sales followed importantly by capital contributions tied to an annual special parcel tax to fund fire flow improvements at 8.2%. Significantly, the absence of the fire flow tax would leave MMWD with year-end deficits in each of the last five years.¹⁸¹ Average year-end expenses over the same period have totaled \$60.8 million and were led by personnel accounting for 49.7% of the total followed by depreciation of capital assets at 17.1%. The relationship between MMWD’s revenues and expenses is also trending positively and highlighted by the former outpacing the latter in terms of increases by over three to one. A summary of the five-year averages within both revenue and expense ledgers follows.

MMWD has experienced overall revenue surpluses in each of the year covering the study period and substantively aided by a 1996 voter approved special tax for fire flow improvements. This trend is also improving as revenues are increasing over three to one over expenses.

Study Period Trends in MMWD Revenues			
Amounts in Millions			
Table 4-110 (Marin LAFCO / MMWD)			
Category	Five Year Average (2008-09 to 2012-13)	Percentage Portion of Total	Five Year Trend (2008-09 to 2012-13)
Water Service/Usage Charges	55.418	84.0	27.8
Connection Fees	1.368	2.1	(73.2)
Other	1.227	1.9	0.5
Intergovernmental Grants	0.636	1.0	117.5
Investment Income	(0.074)	(0.1)	(113.5)
Interest Income	0.463	0.7	(90.4)
Rents and Royalties	1.488	2.3	47.9
Capital / Fire Flow Tax	5.437	8.2	(19.3)
	\$65.964	100%	18.2%

¹⁸¹ The special tax funding fire flow improvements was initially approved by voters in 1996 and renewed in 2011. It assigns a flat \$75.00 assessment on all legal parcels and runs through 2031.

Study Period Trends in MMWD Expenses

Amounts in Millions

Table 4-111 (Marin LAFCO / MMWD)

Category	Five Year Average (2008-09 to 2012-13)	Percentage Portion of Total	Five Year Trend (2008-09 to 2012-13)
Salaries and Benefits	30.248	49.7	1.6
Materials and Supplies	2.337	3.8	(14.4)
Operations	2.736	4.5	12.6
Water Conservation/Rebates	0.327	0.5	(99.9)
Electrical Power	3.007	4.9	(5.7)
SCWA Water	5.303	8.7	14.1
Insurance	1.452	2.4	(14.8)
General Administrative	1.951	3.2	4.5
Depreciation	10.398	17.1	12.7
Debt Payment / Interest	3.111	5.1	58.9
	\$60.875	100%	4.7%

B. NORTH MARIN WATER DISTRICT

1.0 Overview

The North Marin Water District (NMWD) was formed in 1948 and encompasses an approximate 100 square mile jurisdictional boundary spanning three distinct service areas. The main service area includes the City of Novato and the adjacent unincorporated areas of Bel Marin Keys, Black Point, Loma Verde, Green Point, and Indian Valley. NMWD’s other two service areas are located in West Marin with the largest covering the adjacent communities of Point Reyes

Entrance to Hamilton Field / Novato



Station, Inverness Park, Paradise Ranch Estates, Bear Valley, and Olema. The third service area covers Dillon Beach’s Ocean Marin Subdivision. Governance is provided by a five-person board whose members are registered voters elected at-large to staggered four-year terms. NMWD overlaps multiple school districts with most students in the main service area within the Novato Unified School District.

NMWD is organized as a limited-purpose agency and provides three services: (a) potable water; (b) non-potable water; and (c) wastewater with the latter limited to the Oceana Marin Subdivision in Dillon Beach. Close to three-fourths of potable water supplies are imported by NMWD from the Russian River through a contract with the Sonoma County Water Agency. The remaining one-fourth of potable water supplies are drawn locally from Stafford Lake and tied to diverting flows from Novato Creek. The average daily

North Marin Water District

Formation Date	1948
Enabling Legislation	Water Code Section 30000 et. seq.
Service Categories	Potable Water Non Potable Water Wastewater
Service Population	64,845
Registered Voters	35,278
Current Buildout Population Estimate	69,101

water demand per resident in MMWD’s Novato and Point Reyes Station systems over the study period has been 130 and 118 gallons, respectively.¹⁸²

NMWD’s total service population is estimated by the Commission at 64,845 with 97% - or 62,891 – residing within the Novato system as of the term of this study period. It is also estimated NMWD’s service population – and specifically those directly served by the District’s potable water system – has increased by 0.4% over the study period and is slightly below the county wide growth rate average of 0.6% over the same period. The

¹⁸² These amounts are drawn from total water production between 2009 and 2013 and calculated using the Commission’s own resident population projections for NMWD.

projected buildout population as calculated by the Commission and based on current planning policies of the two land use authorities within NMWD is estimated at 69,101.¹⁸³ Registered voters total 35,249 and represents 54.4% of the estimated population. The operating budget as of the term of the study period was set at \$18.6 million with funding anticipated to cover the labor costs for 50.0 equivalent fulltime employees. The unrestricted/undesigned fund balance was \$13.071 million and sufficient to cover 36 weeks of general operating expenses as set for 2013-2014.

2.0 Background

2.1 Community Development

NMWD’s main service area – Novato – began its present-day development in the 1850s in step with the inclusion of the region as part of a Mexican land grant – “Ranchos Novato” – that came under the ownership in 1856 of two eventual community patriarchs: Joseph Sweetser and Francis DeLong.¹⁸⁴ The two men subsequently planted thousands of acres of apple orchards throughout the rancho and later began selling excess lands to arriving Europeans, leading to the establishment of ranching and dairy operations in the area. By the 1880s, following the arrival of the railroad connecting the area to regional commerce, development interests intensified and the Home and Farm Company purchased and subdivided nearly 6,000 acres of present-day Novato. This purchase marked Novato’s gradual and outward transition from agricultural to urban and immediately preceded the construction of a commercial corridor along present-day Grant Avenue as well as adjacent Victorian-style homes to be known as “Old Town” as the community entered the 20th Century.



¹⁸³ Current and projected service populations are detailed in Section 4.1.

¹⁸⁴ Background information is principally drawn from prior LAFCO reports and substantively supplemented from Then and Now’s *Novato* (Novato Historical Guild with Ron Vela).

Novato's urban development continued incrementally through the early 1900s as ranchers began selling their lots to make way for new residential subdivisions, mostly located along stretches of Novato Creek west of Old Town. Novato's development was tempered for many decades due to sustained ranching and dairy operations that proved profitable and it was not until 1920 when the community's population reached an estimated 1,200 and helped promulgate the need and formation of the Novato Fire Protection District in 1926. Wartime planning in 1935 escalated Novato's growth with the conversion of the Marin County Airport to the Hamilton Air Force Base and resulted in new housing and commercial demands throughout the region. The transition and operation of Hamilton by the Air Force, notably, contributed to a sizable increase in Novato's population with the census count rising to 3,500 by 1950.

Organized water service within Novato was initially established through private utilities beginning in the early 1900s in step with individual subdivisions before eventually coming under common ownership by the Novato Water Company during the 1920s. Water was sourced from groundwater wells and was generally low quality but adequate for the relatively slow-growing community through the 1930s. The establishment of the Hamilton Air Force Base and the resulting commercial and residential development proved taxing on the now combined private water system and prompted community leaders in 1947 to ask Marin Municipal Water District (MMWD) to extend their services north and into Novato.¹⁸⁵ MMWD declined and the community leaders transitioned their efforts in devising plans on establishing a new public water agency to purchase Novato Water Company's system and assume service responsibilities thereafter.

2.2 Formation Proceedings

The formation of NMWD – which was initially termed the North Marin County Water District – was petitioned by area landowners and completed in 1948 with the County of Marin's Boundary Change Commission approving the official service area of the District followed by a successful vote of residents.¹⁸⁶ The original boundary included approximately 40,000 acres of unincorporated territory and was anchored by Novato's Old Town. An initial five-member Board of Directors was also elected and shortly thereafter separate measures were approved to fund NMWD's purchase of the Novato Water Company and its facilities along with making improvements. These subsequent voter-approvals also authorized NMWD to proceed with establishing a new stand-alone surface water supply by damming Novato Creek and creating Stafford Lake.

¹⁸⁵ MMWD initially provided water service to Hamilton Air Force Base before NMWD assumed responsibility in 2002.

¹⁸⁶ The County Boundary Commission was a technical governing body tasked with officially designating the jurisdictional boundary of all boundary changes prior to LAFCO's creation in 1963. The boundary commissions included four distinct members of county government, supervisor chairperson, assessor, auditor, and surveyor.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by NMWD and/or affecting the District's service area following formation in 1948 is provided below.

- 1950s • NMWD completed construction of the Stafford Dam in 1951 along with ancillary improvements tied to onsite treatment and distribution facilities in support of the District's Novato system. The resulting water body – Stafford Lake – draws water from Novato Creek and was initially outfitted with a holding capacity of 1,720 acre-feet. This capacity was raised to 4,450 acre-feet in 1954 and enhancing annual safe yield to 2,000 acre-feet.
- 1960s • Voters approved the City of Novato's incorporation on November 3, 1959 with an effective date of January 20, 1960. The estimated population at the time of Novato's incorporation was 17,881.
- NMWD entered into an agreement in 1960 with Sonoma County Water Agency for an annual supply of 10,000 acre-feet of pretreated water drawn from the Russian River and wheeled through an interconnection with the City of Petaluma. The resulting intertie – to be known as the North Marin Aqueduct – was constructed one year later and involved an approximate 10-mile 30-inch pipeline connecting NMWD's water system to Sonoma County Water Agency's water system in Petaluma along State Highway 101.
- NMWD annexed several unincorporated communities between 1969 and 1979 in West Marin at the request of local citizens and leading to the establishment of a second service area, Point Reyes Station. These annexations involved the Point Reyes Station, Olema, Paradise Ranch Estates, Inverness Park, Oceana Marin, and Tomales communities and were expected to facilitate NMWD purchasing and assuming service responsibilities from preexisting private utilities. Voters ultimately approved assessment districts in Point Reyes Station and Inverness Park in 1970 with NMWD purchasing and assuming water services in these communities thereafter. Similar voter-approvals and service establishments in Olema occurred in 1973 and Paradise Ranch Estates in 1978.¹⁸⁷
- 1970s • NMWD assumed wastewater service in 1973 for the 251-lot Oceana Marin Subdivision adjacent to the unincorporated community of Dillon Beach at the request of the County of Marin.

¹⁸⁷ Inverness PUD established water service for North Inverness in 1951. Dillon Beach continues to be served by a private water company. No community water service exists in Tomales.

- 1970s
 - NMWD entered into a new water supply agreement in 1974 revising and expanding its existing agreement with the Sonoma County Water Agency. The revised agreement established funding and capacity allowances tied to a new intertie pipeline and production facilities needed to improve Russian River deliveries to South Sonoma County and NMWD. The revised agreement increased NMWD's capacity allowance to 11.2 million gallons per day of treated water through the North Marin Aqueduct.¹⁸⁸
 - NMWD built and operated a community wastewater system for the unincorporated community of Tomales in 1979. The wastewater system was turned over to the newly created Tomales Village Community Services District in 1999 as part of a voter-approved reorganization in which the unincorporated community was detached from NMWD.
- 1990s
 - The Hamilton Air Force Base – earlier termed the Hamilton Army Airfield – officially closed in 1996 following a decade long draw-down in military uses with Novato assuming land use control thereafter.
- 2000s
 - The Hamilton area was annexed to NMWD in 2002 consistent with the terms of a memorandum of understanding between NMWD and MMWD premised on aligning the former's southern boundary to match the City of Novato.
 - NMWD prepared and completed its first Urban Water Management Plan in 2005 covering the Novato service area. The document was updated in 2011 and projects an existing shortfall in available supplies under single-dry year conditions that will peak at (715) acre-feet in 2015 before gradually decreasing through anticipated conservation efforts and recycled water development to (172) acre-feet in 2035.
 - Construction was completed in 2006 on upgrading NMWD's Stafford Lake Water Treatment Plant. The upgrade cost \$16.0 million and increased daily treatment capacity for the facility to 6.0 million gallons.

¹⁸⁸ NMWD's revised daily capacity allowance of 11.2 million gallons is the equivalent to 34.4 acre-feet.

2.4 Previous Municipal Service Review

The Commission’s inaugural municipal service review for NMWD was completed in June 2002 as part of a regional study of the Novato area.¹⁸⁹ This initial municipal service review provided a baseline review of NMWD’s water system specific to the Novato service area; no review of the Point Reyes Station system was performed. The document concluded NMWD appeared to be operating efficiently and in a fiscally sound manner with no significant infrastructure needs or deficiencies identified. The document also concluded no alternative reorganizations appeared merited for additional study relative to improving accountability or efficiency.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

NMWD’s existing jurisdictional boundary is approximately 100 square miles in size and covers over 64,600 acres with over four-fifths (53,505 acres) lying in unincorporated areas. Overall there are 23,236 legal parcels within NMWD based on County Assessor’s Office with a current combined assessed value of \$11.103 billion. Ownership of these legal parcels is divided between 96% private and 4% public with the latter category disproportionately accounting for almost one-third (29.1%) of all jurisdictional acres (including water and right-of-ways). Total assessed value (land and structures) within NMWD is set at \$11.1 billion as of January 2015.

NMWD’s jurisdictional boundary spans 100 square miles with 83% of total District acres lying within the unincorporated area; the remaining 17% lies in the City of Novato. Current assessed value is set at \$11.1 billion and represents an estimated per capita value of \$0.171 million.

The portion of NMWD’s jurisdictional boundary under private ownership is largely developed – though not necessarily to maximum density – with 95.0% or 21,221 of the affected legal parcels with improved structures. This existing development, notably, includes 24,228 total residential units.¹⁹⁰ Projected future development of the remaining privately owned and undeveloped lots within NMWD is estimated by the Commission to include the future construction of 1,361 new residential units and nearly all tied to single-family structures. This projection is further

Projected future development within NMWD is estimated by LAFCO to include the future construction of 1,361 new residential units and nearly all tied to single-family structures.

¹⁸⁹ Other agencies included in the referenced inaugural municipal service review included the City of Novato, Bel Marin Keys Community Services District, Novato Sanitary District, and the Novato Fire Protection District.

¹⁹⁰ Existing residential units within NMWD are divided between the City of Novato at 19,391 and the County at 4,837 based on County Assessor Office’s records accessed through MarinMap. (NMWD reports a similar residential unit total of 23,943.)

divided between the future construction of 889 units in the Novato system and 426 units in the Point Reyes Station system as detailed in the accompanying footnote.¹⁹¹

NMWD's Jurisdictional Boundary Characteristics

Table 4-112 (Marin LAFCO / Marin LAFCO)

Total Jurisdictional Acreage.....	64,620
Total Jurisdictional Parcels.....	23,236
- Number of Parcels Under Private Ownership / Total Acres.....	22,333/ 35,980
- Number of Parcels Under Public Ownership / Total Acres.....	903 / 14,750
- Total Number of Water or Public Right-of-Way Acreage.....	13,890
- Percentage of Parcels Under Private Ownership Developed.....	96.0
- Percentage of Parcels Under Private Ownership Undeveloped.....	4.0
Total Number of Registered Voters.....	35,249
Total Assessed Value.....	\$11.103 b

Notes to Boundary Characteristics Table:

- 1) There are 903 parcels within NMWD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

NMWD's jurisdictional boundary has expanded by close to one-third since the Commission assumed responsibility in overseeing the District's physical development and service area in 1963. Overall there have been 18 recorded boundary changes to NMWD during this period, with the majority of the additions tied to annexations in West Marin occurring between 1966 and 1975. These annexations were generally engendered at the request of the County of Marin to facilitate NMWD purchasing several private water service utilities within these West Marin communities that were collectively experiencing service problems and required public-financing to make necessary improvements to accommodate needs going forward.¹⁹² One exception involved the phased annexation of the Oceana Marin Subdivision adjacent to Dillon Beach in the early 1970s and its singular purpose of NMWD establishing public sewer service for the residential development. The most recent boundary change of significance occurred in 2002 with the annexation of the former Hamilton Air Force Base to NMWD. The last five boundary changes involving NMWD have primarily involved annexations in Oceana Marin to connect existing residential lots to the sewer system and are listed below.

NMWD's Last Five Boundary Changes

Table 4-113 (Marin LAFCO)

Affected Area	Action	Date Completed	Service Area	Acreage
Lands of Smith / Dillon Beach	Annexation	August 6, 1993	West Marin	0.40
Tomales Community/ Tomales	Detachment	November 23, 1999	West Marin	173.90
Hamilton Field / South Novato	Annexation	June 24, 2002	Novato	980.17
Lands of Mott / Dillon Beach	Annexation	November 28, 2006	West Marin	0.59
Lands of Brown / Dillon Beach	Annexation	May 29, 2013	West Marin	0.13

¹⁹¹ The projected new residential development is based on land availability assessed in the affected two local land use authorities' housing elements specific to NMWD's jurisdiction prepared for 2015-2023 cycle.

¹⁹² One of the West Marin areas annexed – Tomales – in the late 1960s was subsequently detached from NMWD in 1998 as part of the formation of the Tomales Community Services District at the request of residents.

3.3 Sphere of Influence

NMWD’s sphere of influence is presently 63,990 acres or 100 square miles in size and entirely coterminous with the jurisdictional boundary. The sphere was established by the Commission in December 1984 and purposely set to match NMWD’s entire jurisdictional boundary with the notable exception of excluding the unincorporated community of Marshall. (The establishment of NMWD’s sphere coincided with similar actions for nearly one dozen other agencies.) The Commission subsequently approved applicant petitions to expand the sphere between 1990 and 1993 to include the Oceana Marin Subdivision next to Dillon Beach (West Marin) and Hamilton Field (Novato). The Commission also completed a sphere update in 2002 as a result of CKH that affirmed the designation with the addition of Marshall.

NMWD’s sphere is entirely coterminous with its jurisdictional boundary; i.e., this baseline suggests no expansion of the jurisdictional boundary is expected as of the last update in 2002.

3.4 Outside Services

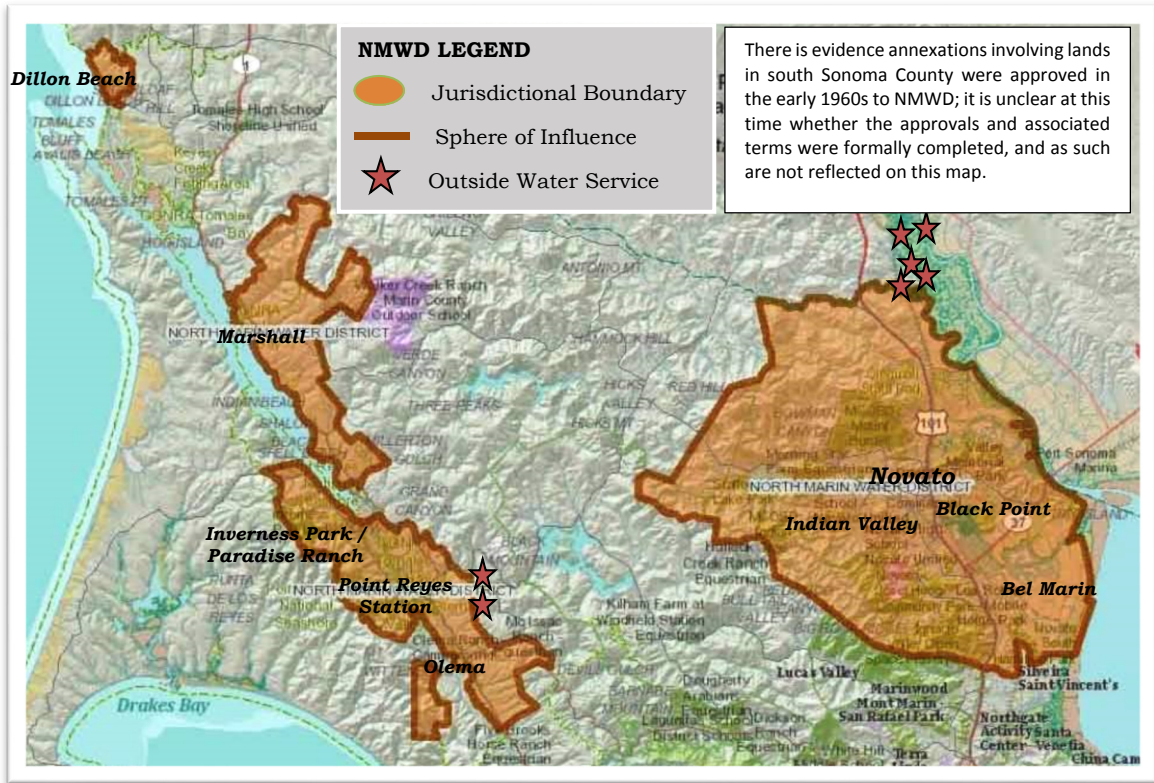
NMWD reports the District currently provides water service to 38 properties lying outside its jurisdictional boundary. All of these outside service connections lie beyond NMWD’s sphere of influence with the majority – 33 – located in Sonoma County and mostly support non-residential uses immediately south of the City of Petaluma. These outside services were first established in the 1960s with a current registry below.¹⁹³

NMWD’s Active Outside Water Service Connections		
Table 4-114 (NMWD)		
Street Address	Assessor Number	Water System
12602 State Route 1	119-020-07	Point Reyes Station
12700 State Route 1	119-020-10	Point Reyes Station
12710 State Route 1	119-020-11	Point Reyes Station
14700 State Route 1	119-020-22	Point Reyes Station
12800 State Route 1	119-020-10	Point Reyes Station
200 Tomasini Canyon	119-050-11	Point Reyes Station
4115 Kastania Road	019-320-013	Novato
4220 Redwood Highway South	019-330-021	Novato
4410 Redwood Highway South	019-330-004	Novato
4415 Redwood Highway South	019-330-005	Novato
4414 Redwood Highway South	019-310-022	Novato
4418 Redwood Highway South	019-310-019	Novato
4412 Redwood Highway South	019-310-029	Novato
4796 Redwood Highway South	019-310-012	Novato
2543 Petaluma Blvd South	019-220-038	Novato
21 Gunn Drive	019-300-005	Novato
4550 Redwood Highway South	019-330-006	Novato
4300 Redwood Highway South	019-330-017	Novato
3351 Redwood Highway South	019-320-010	Novato

¹⁹³ As of 2001, all outside service extensions are required to request and receive Commission approval under G.C. Section 56133 with the Legislature prescribing two types of approval allowances. First, if located within the affected agency’s sphere of influence, LAFCO may approve a request for outside service in explicit expectation of a later change of organization. Second, if located outside the sphere of influence, LAFCO may approve a request for outside service in explicit response to a documented public health or safety finding.

Street Address	Assessor Number	Water System
2244 Petaluma Blvd	019-320-023	Novato
3357 Petaluma Blvd	019-320-021	Novato
4680 Redwood Highway South	019-310-013	Novato
2645 Petaluma Blvd South	019-220-006	Novato
210 Landing Way	019-220-016	Novato
150 B Landing Way	019-220-015	Novato
2551 Petaluma Blvd South	019-220-009	Novato
2581 Petaluma Blvd South	019-220-036	Novato
2531 Petaluma Blvd South	019-220-010	Novato
2141 Petaluma Blvd South	019-220-011	Novato
4600 Redwood Highway South	019-310-028	Novato
4420 Redwood Highway South	019-310-023	Novato
5200 Redwood Highway South	019-300-016	Novato
4900 Redwood Highway South	019-300-017	Novato
4775 Redwood Highway South	019-330-013	Novato
3905 Redwood Highway South	019-320-027	Novato
4809 Redwood Highway South	019-330-028	Novato
9 Cloud	019-300-015	Novato
2543 Petaluma Blvd	019-220-038	Novato

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

NMWD’s resident service population served by the District’s two water systems is estimated by the Commission at 64,845 as of the term of this study period. This estimate is divided between 62,891 and 1,954 within the Novato and Point Reyes Station systems, respectively.¹⁹⁴ This estimate also indicates NMWD is at 93.8% with respect to its meeting its jurisdictional boundary’s projected buildout total of 69,101 based on the current policies and housing projections of the two affected land use authorities.¹⁹⁵ The current resident estimate is based on a modified calculation specific to public water systems and represents a total population growth rate of 0.42% over the preceding five year period or 0.08% annually; an amount that is 1.5 times lower than the estimated annual growth rate for the entire county over the same period.

LAFCO estimates there are 64,845 total residents within NMWD that are explicitly served by the District. This means NMWD is at 94% of its resident buildout, and not expected to reach buildout until 2083.

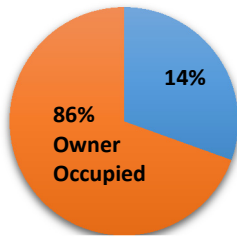
With respect to projections going forward, and for purposes of this review, it is assumed the growth rate within NMWD and for its two service areas – Novato and Point Reyes Station – will match the study period with an overall yearly change of 0.08%. The substantive result of this assumption would be an overall increase in NMWD’s resident population of 587 and produce a total of 65,432 by 2023. It also indicates – and if this growth rate were to hold thereafter – NMWD will reach its estimated current-planning resident buildout of 69,101 in the year 2083. These collective projections – past, current, and future – are summarized below.

NMWD: Population Estimates For Water Systems					
Table 4-115 (Marin LAFCO)					
Service Area	2009	2013 -Baseline-	2018	2023	Annual Trend
Novato	62,657	62,891	63,143	63,396	0.08%
Point Reyes Station	1,915	1,954	1,994	2,036	0.41%
	64,572	64,845	65,137	65,432	0.08%

¹⁹⁴ California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid option is appropriate with respect to estimating NMWD’s resident service population that combines two distinct calculations: (a) multiply the number of residential connections in the Novato system by 3.3 and (b) multiply the number of residential connections in the Point Reyes Station system by 2.8.

¹⁹⁵ NMWD’s resident buildout population has been calculated by the Commission and based on multiplying the total number of potential new units identified in the two affected land use authorities’ housing elements – 1,361 – that lie within the District by either a factor of 3.3 (Novato system) or 2.8 (Point Reyes Station system). Actual construction is subject to external factors and highlighted by the status of the moratorium on water service connections and market demands and permit approvals from the affected land use authorities.

4.2 Residency Type



The Commission projects for the purposes of this review that NMWD’s estimated residential total of 64,845 as of the term of the study period is roughly divided between 55,572 fulltime or owner-occupied versus 9,273 part-time or non-owner occupied residents with the accompanying calculation footnoted.¹⁸⁷ This projection is based on a review of current County Assessor records and indicates no less than 86% of NMWD’s residents are presumably

4.3 Social and Economic Indicators

A review of demographic information covering the study period for the communities within NMWD’s jurisdictional boundary – specifically a weighted calculation involving Novato, Point Reyes, Black Point, and Dillon Beach (Oceana Marin) – indicates the District’s service population generally follows countywide norms with three notable exceptions. First, NMWD’s overall service population is statistically less affluent given lower median

NMWD’s fulltime constituents are generally aligned statistically with countywide averages with respect to social and economic indicators with the notable exceptions of lower median household incomes and higher unemployment levels.

household incomes and higher unemployment levels compared to countywide averages with the latter being a difference of nearly one-fourth and having increased by 27.7% over the five-year sampling period. Second, educational attainment among residents within NMWD is lower than countywide averages as measured by adults with bachelor degrees by more than one-fifth. Third, the jurisdictional boundary’s residents are statistically more heterogeneous relative to the countywide average. The former two referenced distinctions are driven and pronounced in NMWD’s main service area of Novato where median household incomes and bachelor degree holdings as of the last census release was \$79,664 and 44.9%, respectively, and in comparison to countywide averages of \$90,962 and 54.6%. A summary of trends in pertinent demographic information for NMWD’s service communities follows.

¹⁹⁶ This projection is based on taking the total number of units - 19,512 - assigned to all developed single-family residential lots within NMWD and developing a percentage of those associated units with local ownership addresses (85.7%) versus those with non-local mailing addresses (14.3%) and applied to the projected overall population of 64,845. The projection does not take into account the potential for non-owner residents (renters) within NMWD.

NMWD Resident Trends in Social and Economic Indicators
 Table 4-116 (Marin LAFCO / American Communities Survey)

Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Average
Median Household Income	\$81,555	\$80,523	(1.3%)	\$90,962
Median Age	42.7	44.0	3.0%	44.6
Prime Working Age (25-64)	55.8 %	56.1%	0.5%	56.6%
Unemployment Rate (Labor Force)	4.7%	6.0%	27.7%	4.5%
Persons Living Below Poverty Rate	6.8%	7.2%	5.9%	7.5%
Mean Travel to Work	30.9 minutes	28.8 minutes	(6.8%)	28.4 minutes
Adults with Bachelor Degrees or Higher	42.3%	45.0%	6.4%	54.6%
Male	49.9%	47.8%	(4.2%)	49.2%
Female	50.1%	52.2%	4.2%	50.8%
White / Non-Hispanic	70.1%	71.2%	1.7%	73.1%
Hispanic	17.5%	16.6%	(5.4%)	15.3%
Other	12.4%	12.1%	(2.4%)	11.6%

Notes to Demographics Table:

- 1) This table reflects a weighted calculation prepared by LAFCO staff coalescing census data generated for the communities of Novato (95.9%), Black Point (2.2%), Point Reyes Station (1.1%), and Dillon Beach (Oceana Marin) (0.8%).

5.0 Organizational Structure

5.1 Governance

NMWD’s governance authority is codified under the County Water District Act (“principal act”) and empowers the District to provide a limited purpose of municipal services upon approval by LAFCO. NMWD – which is currently one of 162 county water districts operating currently in California – is presently authorized to provide three specific services within its jurisdictional boundary: (a) domestic water; (b) non-potable water; and (c) wastewater. All other latent powers enumerated under the principal act would need to be activated by the Commission before NMWD would be allowed to initiate; similarly divestiture of existing powers would also require prior approval from LAFCO.

LAFCO approval is needed for NMWD to activate a latent power or divest itself from an existing service.

A list comparing active and latent power authorities under the principal act follows.

Active Service Powers

- potable / non potable water
- wastewater

Latent Service Powers

- reclamation
- recreation
- hydroelectric power
- fire protection
- solid waste/garbage

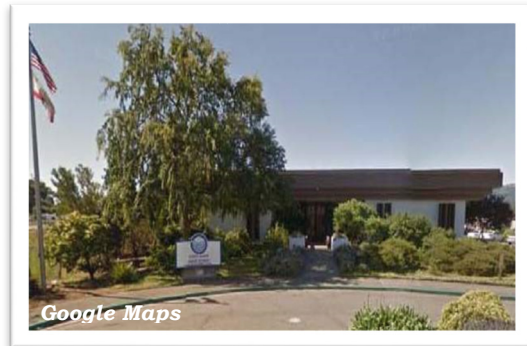
NMWD has been governed since its formation in 1948 as an independent special district with registered voters comprising a five-member governing board. Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating president system and receive a \$205 meeting per diem. NMWD currently meets on the first and third Tuesday at 7:00 P.M. of each month at the District’s Administrative Office at 999 Rush Creek Place in Novato. A listing of Board members with respective backgrounds and continuous years served follows.

NMWD Board Roster			
Table 4-117 (NMWD)			
Member	Position	Background	Years on Board
Jack Baker	President	Civil Engineer	31
John C. Schoonover	Vice President	Self-Employed	30
Rick Fraites	Member	Administrative Aide	10
Stephen Petterle	Member	Landscape Architect	10
Dennis J. Rodoni	Member	Contractor	19
Average Years of Board Experience			20

5.2 Administration

NMWD appoints an at-will General Manager to oversee all District activities. The current General Manager – Chris DeGabriele – was appointed by the Board in 1995 and manages a present budgeted staff of 50 fulltime equivalent employees; the latter of which is divided between four distinct personnel divisions: (a) administrative/finance; (b) engineering; (c) construction; and (d) operations. Legal services are provided by contract with Robert Maddow and his firm Bold, Polisner, Maddow, Nelson and Judson LLC. NMWD’s administrative offices are located at 999 Rush Creek Lane in Novato.

NMWD Administrative Offices

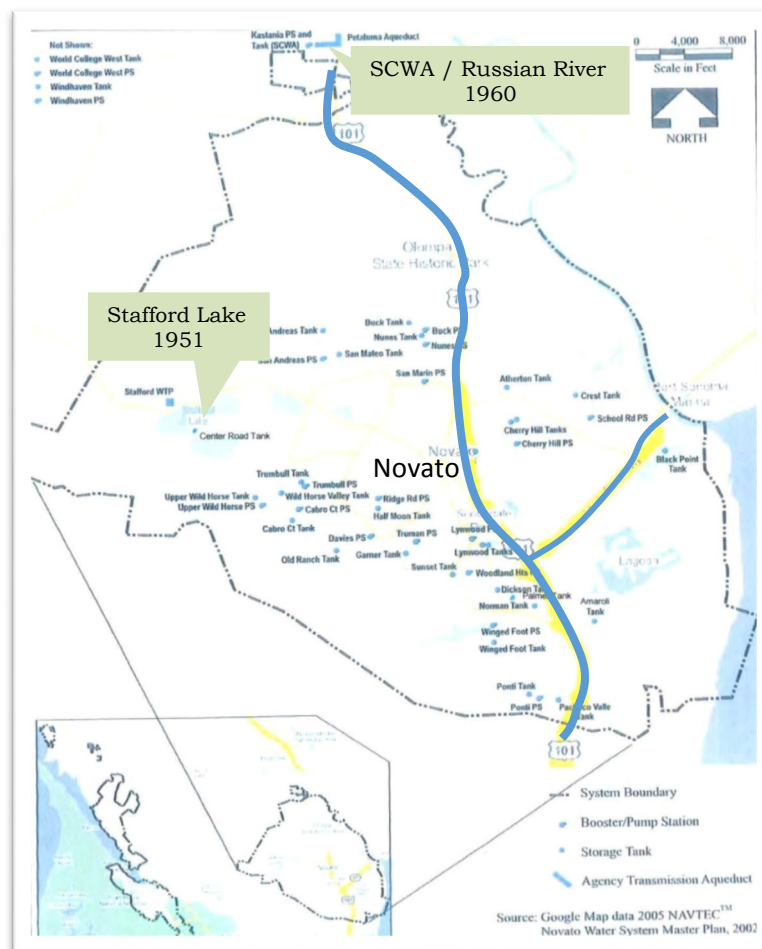


NMWD Administration	
Table 4-118 (NMWD)	
General Manager.....	Chris DeGabriele
Legal Counsel.....	Robert Maddow
Water System Operator.....	Robert Clark

6.0 Potable Water Services

6.1 Service Overview

NMWD directly provides retail potable water services through a combination of its own and contracted supply, treatment, storage, and distribution facilities. The NMWD facilities were initially inherited from prior private utility companies beginning with the purchase of the Novato Water Company in 1948. Other private utility systems in West Marin (Point Reyes Station) were purchased and later consolidated by NMWD between the 1960s and 1970s. The end result is NMWD operating two stand-alone water systems termed (a) “Novato” and (b) “Point Reyes Station” with distribution networks that separately span 317 and 24 miles, respectively. NMWD also provides non-potable water services to limited areas within its jurisdictional boundary. A summary review of these non-potable water services are addressed in a succeeding section and a graphical overview of NMWD’s Novato water system follows.¹⁹⁷



¹⁹⁷ Inclusion of a graphical overview for NMWD’s Point Reyes Station system will be added as a subsequent appendix.

6.2 Supplies

Novato System

NMWD's potable water supplies for the Novato system are drawn from a combination of local and imported sources. These sources – all of which have permit or contractual terms – collectively provide the Novato system with access to a maximum annual supply of 22,554 acre-feet. A summary of these water sources divided between primary (Russian River) and secondary (Novato Creek) follows.

NMWD's maximum annual potable water yield for the Novato system is calculated at 22,554 acre-feet and tied to its two established sources: Russian River and Novato Creek.

Primary Source

NMWD's primary potable water source for the Novato system is drawn from the Russian River Project and secured through a wholesale agreement with the Sonoma County Water Agency (SCWA).¹⁹⁸ This agreement provides NMWD with an annual contractual entitlement of up to 4.5 billion gallons or 14,100 acre-feet of treated potable water drawn from underflow of the Russian River through specialized filtering wells near Forestville in Sonoma County. This agreement was originally established in 1960 and restructured most recently in 2006 with a current term date of June 2040.¹⁹⁹ The agreement enables NMWD through a cost-sharing arrangement with SCWA and other regional contractors to divert, treat, and convey – or wheel – water from the Russian River through a series of aqueducts, pipelines and pumps that ultimately spans nearly 30 miles before connecting to the District's distribution system. The agreement allows for fluctuation to address high usage periods and authorizes NMWD to take up to 20.9 million gallons or 64.1 acre-feet in a single day. Deliveries from the Russian River totaled 2.8 billion gallons or 8,455.6 acre-feet at the term of the study period accounted for slightly more than three-fourths of all NMWD supply production during the year.

The Novato system's primary potable supply is the Russian River and secured through a contract with SCWA; a dependent special district of the County of Sonoma. The contract provides NMWD an entitlement of up to 14,100 acre-feet of treated water each year less any external restrictions.

¹⁹⁸ The Russian River Project was constructed by the United States Army Corps of Engineers beginning in the 1950s to improve flood control and access and reliability to water supplies drawn from the Russian River and its approximate 1,500 square mile watershed. Two public work projects anchor the Russian River Project and are tied to impounding and storing flows for later release as needed. Lake Mendocino was created in 1958 with the construction of the Coyote Valley Dam near the City of Ukiah and has a supply capacity of 122,500 acre-feet. Lake Sonoma was created in 1983 with the construction of the Warm Springs Dam near the City of Healdsburg and has a supply capacity of 245,000 acre-feet.

¹⁹⁹ The agreement includes a renewal option for NMWD to extend the agreement for additional 40 year terms.

A pump station currently affixed to the North Marin Aqueduct – the conveyance system delivering treated Russian River supplies to NMWD’s distribution system – has a maximum capacity of 14,000 gallons per minute or 61.86 acre-feet per day. This capacity accommodates 97% of the maximum daily allowance total of 64.1 acre-feet.²⁰⁰

Secondary Source(s)

Local surface supplies drawn from Novato Creek and generated from storage at Stafford Lake accounts for NMWD’s remaining potable water supply for the Novato system.²⁰¹ NMWD maintains two separate post-1914 appropriative rights with the State Water Resources Control Board dating back as far as 1950 to draw water from Novato Creek through impoundment at Stafford Lake diversion points, and each with different usage allowances. These allowances, which also provide maximum daily and monthly amounts, authorize NMWD to collectively divert and use up to 8,454 acre-feet each year directly from the Novato Creek by gravity to its water treatment facility for immediate use within the distribution system.²⁰² The total holding capacity at Stafford Lake is 4,450 acre-feet. Water production from Stafford Lake totaled 803.5 million gallons or 2,465.5 acre-feet and accounted for slightly less than one-fourth of all NMWD supply production at the term of the study period for the Novato system.

NMWD’s secondary potable supply for the Novato system is drawn from the Novato Creek. This secondary supply is secured through appropriative rights and impounded at Stafford Lake with a reservoir holding capacity of 4,450 acre-feet.

Gravity provides diversion and conveyance of raw-water from Novato Creek through Stafford Lake to NMWD’s adjacent treatment facility.²⁰³

²⁰⁰ NMWD anticipates eliminating this conveyance restriction upon completion of a planned project to reposition a portion of the aqueduct to eliminate the need for the pump station with a completion date for late 2015.

²⁰¹ The Novato Creek is a tributary to the San Pablo Bay.

²⁰² License No. 9831 is predicated on a 2.9 cubic foot per second allowance to NMWD between September 1st and June 30th and translates to a daily and monthly maximum draw of 5.75 and 174.9 acre-feet, respectively. This license also allows NMWD to divert up to 4,490 acre-feet a year with 2,300 acre-feet authorized for use; the remainder goes to storage in Stafford Lake. Permit No. 18800 is predicated on a 9.75 cubic foot per second allowance between October 1st and April 1st and translates to a daily and monthly maximum draw of 19.33 and 588.08 acre-feet, respectively. This permit also allows NMWD to divert up to 8,454 acre-feet a year with 4,054 acre-feet authorized for use; the remainder goes to storage in Stafford Lake.

²⁰³ Pumps are available to NMWD to convey raw water from Stafford Lake when needed to boost flows as necessary.

Supply Average

NMWD's average water production drawn over the study period from the District's primary (Russian River) and secondary (Novato Creek) for the Novato system has been 3.232 billion gallons or 9,917.7 acre-feet.²⁰⁴ The single-highest year-end use of these surface sources over the study period occurred in 2009 when NMWD collectively drew 3.559 billion gallons or 10,921 acre-feet; an amount that exceeded the average annual take by more than one-tenth and with 77.4% drawn from the Russian River.

NMWD's average annual water production over the study period from its two sources for the Novato system has been 9,917.7 acre-feet; an amount that is 47.7% of the maximum yield available.

Supply Reliability

The majority of NMWD's water supplies – on recent average 80% – is imported from Sonoma County and tied to a contractual relationship with externally prescribed terms and conditions. This contractual relationship means NMWD is largely dependent on a separate governing body – SCWA – in managing resources now and into the future to help ensure annual water entitlements to the Russian River Project

NMWD is significantly dependent on an external body – SCWA – in meeting its current and future system demands in the Novato system. This dependency produces a substantive impact on the reliability of NMWD's primary water supply given the associated externalities tied to the production, treatment, and delivery to the District.

are available to meet demands within the Novato system. This contractual relationship also requires dependency on other third-party agencies that contract with SCWA to abide by capacity allowances with the underlying conveyance system – such as the City of Petaluma – to avoid adversely impacting NMWD and its ability to access entitlements in a consistent and timely manner. The contract itself provides NMWD the sole discretion to renew or cancel in 40 year intervals.²⁰⁵

The remainder of NMWD's water supplies – on average 20% - is locally sourced from Stafford Lake and provides a relatively reliable secondary supply directly managed by the District Board. NMWD also benefits from nearly one-half of the approximate 17.1 square mile watershed for Novato Creek protected from intensive urban development by either being under Williamson Act contracts and/or conservation easements with the Marin Agricultural Land Trust.²⁰⁶ Nonetheless, the intensity of the agricultural uses – and in particular dairy operations – does impact water quality and merits further assessment going forward. Other impacts on this secondary water supply is periodic

²⁰⁴ Totals are drawn from NMWD's annual diversion filings with the State Water Resources Control Board (2009 to 2013) and SCWA delivery reports (2008/2009 to 2013/2014).

²⁰⁵ NMWD's existing agreement with SCWA is set to expire in June 2040. The contract provides NMWD the option to exercise an automatic 40 year renewal at its discretion.

²⁰⁶ Estimates are based on data generated from MarinMap.

drought and climate change effecting – among other items - runoff needed to supply Novato Creek.

In 2011, as required under State law, NMWD published an update to its Urban Water Management Plan (UWMP) to guide long-term agency planning in matching demands with supplies.²⁰⁷ The UWMP is specific to the Novato system and estimates NMWD’s service population as of 2010 at 60,423 based on demographic information published by the Association of Bay Area Governments (ABAG) with a corresponding annual water demand of 8,832 acre-feet. The UWMP projects rises in both customers and demands with overall increases in these categories totaling 10.5% and 38.8%, respectively, by 2020.

NMWD projects an overall decrease in annual potable water supplies for the Novato system to 10,494 acre-feet during a significant drought year event based on applying conditions from 1976-1977. This projection represents a 46.5% decrease in supplies relative to the maximum potential yield available to NMWD’s Novato system.

The UWMP also projects water supplies under normal, single dry-year, and multiple-dry year conditions relative to estimated demands through 2035. This includes a shortfall in supplies under single-dry year conditions for the Novato system and will peak at (715) acre-feet in 2015 before gradually decreasing to (172) acre-feet in 2035 due to increased conservation and recycled water production. The UWMP orients NMWD to anticipate an overall reduction of nearly one-half of the District’s potable water supplies during single-dry or significant drought year conditions with totals decreasing from 22,454 acre-feet to 10,494 acre-feet; a difference of (12,060) acre-feet or (46.7%). This includes NMWD calculating specific reductions, relative to maximum conditions, of 43.3% in its primary water source (Russian River) and 70.4% in its secondary source (Novato Creek). These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by LAFCO for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

The following table summarizes NMWD’s water supply sources relative to right/permit allowance, normal year conditions, and drought year conditions.

²⁰⁷ The Urban Water Management Planning Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections and/or supplying more than 3,000 acre-feet of water annually to adopt and submit a plan every five years to the California Department of Water Resources.

NMWD’s Potable Water Supply Availability – Novato

Listed in Acre-Feet
 Table 4-119 (Marin LAFCO / NMWD)

Water Source	Day Max From Source	Year Max From Source	Convey Day Max To NMWD	Convey Year Max To NMWD	76-77 Drought Day Max To NMWD	76-77 Drought Year Max To NMWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
SCWA / Russian River	64.13	14,100.00	61.86	14,100.00	36.55	7,991.00
Novato Creek - Stafford Lake	19.33	4,450.00	19.33	4,450.00	5.72	1,317.20
Novato Creek - Direct Flows	5.75	4,004.00	5.75	4,004.00	1.70	1,185.18
Total Yield	89.21	22,554.00	86.94	22,554.00	43.97	10,493.38

Total Calculated by NMWD to Parallel 1977; Individual Subtotals Estimated by LAFCO

Notes to Water Supply Table – Novato System:

- 1) NMWD’s supplies to the Russian River are contractually defined as an entitlement and are subject to specified restrictions, including proportional reductions in deliveries due to low storage supplies.
- 2) NMWD’s authority to divert flows from Novato Creek is secured through post-1914 appropriative rights.
- 3) A pump station affixed to the North Marin Aqueduct – the conveyance system that delivers treated Russian River supplies to NMWD’s distribution system – has a maximum capacity of 14,000 gallons per minute or 61.86 acre-feet per day. This capacity is reflected in the daily conveyance maximum to NMWD. (A planned NMWD improvement set for completion in late 2015 is expected to realign the aqueduct and eliminate the need for the pump, which will allow NMWD to take its full contractual daily allocation of up to 64.1 acre-feet.)
- 4) Water diverted from Novato Creek is impounded at Stafford Lake and under normal circumstances conveyed by gravity to NMWD’s adjacent treatment facility.
- 5) Drought year conditions reflect a 43.3% reduction compared to normal/max year conditions for entitlements to the Russian River and based on rainfall during the 1977 water year. A similar reduction in the amount of 70.4% is applied to supplies drawn from the Novato Creek.

Point Reyes Station System

NMWD’s potable water supplies for the Point Reyes Station system are primarily sourced from local diversions tied to underflow from the Lagunitas Creek; a tributary to Tomales Bay within an approximate 38.1 square mile watershed.²⁰⁸ This source coupled with pumping capacities collectively provide the Point Reyes Station system with access to an estimated available annual supply of 868.8 acre-feet, but reduced to a *maximum* annual availability of 654.0 acre feet based on current permit allowances.

NMWD’s maximum annual potable water available for the West Marin water system is 654.0 acre-feet based on applicable permit capacities tied to its post-1914 appropriated rights to Lagunitas Creek.

A summary of the Point Reyes Station system’s primary (“Coast Guard Wells”) and supplemental/emergency (Kent Lake) water source supplies follows.

²⁰⁸ The watershed estimate for Lagunitas Creek generated using data from MarinMap.

Primary Source

NMWD's primary potable water source for the Point Reyes Station system is tied to two groundwater wells that access underflow from Lagunitas Creek and located on land owned by the United States Coast Guard. These wells – collectively termed “Coast Guard Wells” – lie adjacent to each other and drilled to depths of approximately 60 feet and powered by submersible pumps each outfitted with 30 horsepower engines. The rated capacity of the Coast Guard wells when operating concurrently is 420 gallons per minute and could produce a daily maximum of 0.603 million gallons or 1.86 acre-feet, and if run continuously produce a yearly total of 220.1 million gallons or 675.3 acre-feet. These theoretical annual amounts are higher than the permitted allowance for NMWD to divert and use underflow from Lagunitas Creek set by the State Water Resources Control Board. These permits – which constitute post-1914 appropriated rights – collectively assign NMWD to daily and annual maximum totals of 3.85 and 654.0 acre-feet, respectively.²⁰⁹ The Coast Guard Wells are located next to the treatment facilities.

The Point Reyes Station system's primarily potable supply is underflow from Lagunitas Creek and accessed through two wells located on Coast Guard property. The “Coast Guard Wells” and the associated permits provide NMWD a daily and annual take of 3.85 and 654.0 acre-feet of water, respectively.

As a supplemental access point to permitted Lagunitas underflow, NMWD also has developed a second well site along the Lagunitas Creek located upstream from the Coast Guard Wells. The “Gallagher Well” was drilled in 1993 at a depth of 55 feet and is to be used when above-normal high tides cause excessive salinity intrusion in the Coast Guard Wells. The Gallagher Well lies approximately one mile upstream from the Point Reyes Treatment Plant with the underlying connecting pipeline completed in mid 2015. The Gallagher Well draws on underflow of Lagunitas Creek and the diversions are covered under the permitted water rights tied to the Coast Guard Wells. The current rated pump capacity is 0.173 million gallons or 0.53 acre-feet daily, and if run continuously – and irrespective of water right limitations – totals 63.1 million gallons or 193.5 acre-feet per year.²¹⁰

²⁰⁹ NMWD holds three active water rights for underflow from Lagunitas Creek. License No. 4324B allows NMWD to divert 0.67 cubic feet per second (producing a daily max of 1.11 acre-feet) with a maximum annual use of 148.8 acre-feet each year at its well sites between May 1st and November 1st. Permits No. 19724 and No. 19725 are year-round allowances, although are classified as junior rights and therefore not available between July and October during dry-years. Permit No. 19724 allows NMWD to divert up to 0.699 cubic feet per second (producing a daily max of 1.15 acre-feet) with a maximum annual use of 212.7 acre-feet. Permit No. 19725 allows NMWD to divert up to 0.961 cubic feet per second (producing a daily max of 1.59 acre-feet) with a maximum annual use of 292.5 acre-feet. Together Permits No. 19724 and 19725 allows NMWD to collectively divert an additional divert up to 505.2 acre-feet each year from January 1st to December 31st at its well sites. These latter two permits, however, are conditioned to prohibit diversions between July and October in “dry-years”.

²¹⁰ Daily and annual capacities of the Gallagher Well based on a 120 gallon per minute rating.

Secondary Source

NMWD has an agreement with the Marin Municipal Water District (MMWD) to receive up to 250 acre-feet of raw water stored at Kent Lake through Lagunitas Creek. This secondary source is limited to prescribed dry-year conditions and specifically between July and September when NMWD's permitted daily water allowance is reduced from 1.25 million gallons or 3.85 acre-feet to 0.433 million gallons or 1.33 acre-feet. This agreement is intended to allow NMWD to remain generally whole in accessing underflow from Lagunitas Creek when permit conditions curtail normal use, and as such, is not considered a new and separate source for purposes of this review.

Supply Average

NMWD's average water production drawn over the study period from Lagunitas Creek for the Point Reyes Station system has been 95.5 million gallons or 293.2 acre-feet.²¹¹ The single-highest year-end use during this period occurred in 2009 when NMWD collectively drew 141.0 million gallons or 432.7 acre-feet; an amount that exceeded the average annual amount during the study period by more than two-thirds.

LAFCO projects NMWD's annual potable water supplies declining by 14% to 560.5 acre-feet during significant droughts based on 1976-1977; a decline amount that is lessened by the addition of dry-year flows from MMWD.

Supply Reliability

With respect to reliability, and like other public water service providers in the region, the reliability of NMWD's water supply for the Point Reyes Station system is relatively safe from external restrictions given it is entirely locally sourced. NMWD also benefits from its underflow source lying within a relatively secure watershed in terms of limited current and planned urban development. The lone – albeit significant – constraint on NMWD's water supply for the Point Reyes Station system is climate change effecting runoff needed to charge Lagunitas Creek and the salt-water intrusion.

NMWD's average annual potable water production over the study period for the Point Reyes Station system has been 293.2 acre-feet; an amount that is 44.8% of the maximum available diversion rate.

No formal analysis has been performed by NMWD to quantify the District's water supply reliability for the Point Reyes Station system during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some level of curtailment will occur during extended dry periods reducing the overall supply available to NMWD. With this in mind, the Commission projects the overall water supply being reduced up to 14.3% during single-dry years. This reduction

²¹¹ Totals are drawn from NMWD's annual diversion filings with the State Water Resources Control Board covering the water years 2009 to 2013.

aligns with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought and detailed in the accompanying footnote.²¹² The substantive effect of this drought projection is the annual water supply for the Point Reyes Station system being reduced from its normal/maximum level of 654.0 acre feet to 560.5 acre-feet.

The following table summarizes NMWD’s water supply sources for West Marin relative to right/permit allowance, normal year conditions, and drought year conditions.

NMWD’s Potable Water Supply Availability – Point Reyes						
Listed in Acre-Feet Table 4-120 (Main LAFCO / NMWD)						
Water Source	Day Max From Source	Year Max From Source	Convey Day Max To NMWD	Convey Year Max To NMWD	76-77 Drought Day Max To NMWD	76-77 Drought Year Max To NMWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
Lagunitas Creek - Direct Flows	3.85	654.0	1.86	654.0	1.86	405.5
Lagunitas Creek - Dry-Year Flows / MMWD	0.0	0.0	0.0	0.0	- above -	155.0
Total Yield	3.85	654.0	1.86	654.0	1.86	560.5
LAFCO Calculation To Parallel 1976-77 Drought Conditions						

Notes to Water Supply Table – West Marin Water System:

- 1) NMWD has three separate permits to divert water from Lagunitas Creek; all of which are post-1914 appropriate rights. These permits cover withdraws made by NMWD from its Coast Guard and Gallagher well sites.
- 2) NMWD’s emergency supply agreement with Marin Municipal Water District for up to 250 acre-feet of raw water from Kent Lake is accessed through Lagunitas Creek and diverted by-way of the District’s permits with the State Water Resources Control Board. This supply is listed as “dry-year flows” in the above table.
- 3) NMWD’s combined rated capacity at the Coast Guard Well site (420 gallons per minute) would allow the District to draw more than its permitted allowance and total 1.85 acre-feet daily and 675.3 acre-feet annually. Similarly, the rated capacity at the Gallagher Well site (120 gallons per minute) would allow NMWD to further increases its total draw by an additional annual amount of 193.5 acre-feet.
- 4) Drought year conditions reflect a LAFCO incorporated 38% reduction in water supplies compared to normal/max conditions for NMWD’s permitted right to underflow from Lagunitas Creek. This amount is based on a modified version of the Department of Water Resources’ calculation for surface supply curtailment for conditions similar to the 1976-77 drought as detailed in this report.

²¹² State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 74% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale NMWD’s supplies are already incorporate a baseline reduction in total flows in Lagunitas Creek. This assumption also applies to a 38% reduction in the 250 acre-feet of dry-year summer supplies from MMWD.

6.3 Water Treatment Facilities

Novato System

Local Supplies

NMWD treats all raw potable water received from its local surface source (Novato Creek) for the Novato system at its Stafford Treatment Plant. The Stafford Plant was constructed in 1951 and later upgraded in 1973 and again in 2006. It operates seasonally and most frequently during the summer months to help offset demands on pre-treated water imported from the SCWA. The Stafford Plant receives raw water byway of gravity or pumping if needed from an intake tower in Stafford Lake.

NMWD treats all raw potable water collected from Novato Creek at its Stafford Treatment Plant. This facility has a treatment capacity of 4,160 gallons a minute, and if run continuously, results in a daily maximum total of 6.0 million gallons or 18.4 acre feet.

Standard chemical treatment commences with the addition of chlorine dioxide as a pre-oxidant to reduce naturally occurring organic and non-organic materials in the water before actifloc ballasted flocculation occurs to coagulate and filter organic/inorganic materials. A second application of chlorine is added as finished water exits the Stafford Plant and enters the distribution system. The Stafford Plant’s daily treatment capacity is 4,160 gallons a minute and if run continuously results in a daily maximum total of 6.0 million gallons or 18.41 acre-feet. This daily treatment capacity equals 73.4% of the 25.08 acre-feet of permitted water accessibility NMWD can draw from its permitted rights to Novato Creek. This amount – and in terms of stand-alone capacity and irrespective of pretreated water purchased from the SCWA – also equals 40.3% of the Novato system’s current peak-day demand of 14.9 million gallons or 45.7 acre-feet.

Imported Sources

As referenced, all water imported by NMWD from SCWA through the North Marin Aqueduct is pretreated and immediately enters the District’s distribution system.

NMWD’s Water Treatment Facility – Novato		
Table 4-121 (NMWD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Stafford Treatment Plant (Novato Creek)	chlorine dioxide chlorine	6,000,000 gallons / 18.4 acre-feet
Total		6,000,000 gallons / 18.4 acre-feet

Point Reyes Station System

NMWD treats all raw potable water received from its local surface source (Lagunitas Creek) for the Point Reyes Station system at its Point Reyes Treatment Plant. The Point Reyes Plant was constructed in 1970 and most recently upgraded in 2007. It operates continually and receives raw water pumped from the adjacent Coast Guard or more recently upstream Gallagher well sites. Standard chemical treatment commences with the addition of potassium permanganate to oxidize iron and manganese in the water, which is then removed through green-sand pressure filters. An application of chlorine (sodium hypochlorite) is added as finished water exits the Point Reyes Plant and enters the distribution system. The finished water is then conveyed into one of three nearby storage tanks (Point Reyes Tanks) or directly to users. The Point Reyes Plant’s daily treatment capacity is 486 gallons a minute and if run continuously results in a daily maximum total of 0.7 million gallons or 2.1 acre-feet. This daily treatment capacity equals 45.7% of the 4.6 acre-feet of permitted water accessibility NMWD can draw from its permitted rights to Lagunitas Creek. This amount – and in terms of stand-alone capacity – also accommodates Point Reyes Station system’s current peak-day demand of 0.4 million gallons or 1.2 acre-feet.

NMWD treats all raw potable water collected from Lagunitas Creek at its Point Reyes Treatment Plant. This facility has a treatment capacity of 486 gallons a minute, and if run continuously, results in a daily maximum total of 0.7 million gallons or 2.1 acre feet.

NMWD’s Water Treatment Facility – Point Reyes		
Table 4-122 (NMWD)		
Facility	Primary Chemicals	Daily Treatment Capacity
Point Reyes Treatment Plant (Lagunitas Creek)	sodium hypochlorite potassium permanganate	700,000 gallons / 2.14 acre-feet
Total		700,000 gallons / 2.14 acre-feet

6.4 Water Quality

Novato System

NMWD’s most recent water quality report for the Novato system for both production from the Stafford Treatment Plant and deliveries from SCWA covering the study period was issued in May 2014 and covers sample testing for 2013. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the Department of Public Health (DPH); the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found. No actions were required by DPH.

NMWD’s last water quality report for the Novato system shows no excessive primary or secondary contaminants and required no actions by DPH.

Point Reyes Station System

NMWD’s most recent water quality report for the Point Reyes Station system covering the study period was issued in May 2014 and addresses sample testing for 2013. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by DPH; the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found. No actions were required by DPH.

NMWD’s last water quality report for the Point Reyes Station system shows no excessive primary or secondary contaminants and required no actions by DPH.

6.5 Distribution System and Storage Facilities

Novato System

NMWD’s distribution system for the Novato system consists of approximately 317 miles of mains and overlays four connected pressures zones that jointly cover a 400-foot range in elevation between service connections. The distribution system was originally built in the 1920s by the immediate predecessor to NMWD – Novato Water Company – before its phased replacement by the District beginning in the 1950s and primarily ranges in diameter size of six to twelve inches. The distribution system relies on gravity pressure for recharge from 31 storage tanks that collectively hold 38.4 million gallons or 117.8 acre-feet; the latter amount equaling more than four times the average day demand.²¹³ There are also 27 pump stations connected to the distribution system conveying water from lower to higher pressure zones and triggered when operating storage levels within individual zones fall below a designated level.

NMWD’s potable storage capacity within the Novato distribution system totals 118 acre-feet can accommodate up to 2.4 days of average peak-day demand totals over the study period.

Close to 90% of the Novato system’s connections are located within Zones “One” and “Two” and serve development in and around the State Highway 101 corridor. Zone One serves as the initial introduction point for all deliveries from both Stafford and SCWA and accounts for approximately 48% of all connections in the Novato system.²¹⁴ Zone One is located at the lowest elevation range within the distribution system and extends roughly between south Petaluma to the north and south to Hamilton Parkway. Zone

²¹³ NMWD reports the Novato distribution has been entirely replaced over the last 50 years. There are currently 2,618 fire hydrants connected to the distribution system.

²¹⁴ The pumping station is presently needed to deliver SCWA entitlements is located adjacent to the Kastania Storage Tank south of Petaluma (Sonoma County) and can convey up to 20.1 million gallons or 61.9 acre-feet per day. The need for the pump station is expected to be eliminated with a planned realignment project set for completion in late 2015. The conveyance, accordingly, will revert to NMWD’s contractual limitation for daily supplies from SCWA up to a maximum of 64.1 acre-feet.

Two accounts for approximately 43% of all connections in the Novato system and covers the remaining 101 corridor within NMWD's boundary south to Hamilton and Pacheco Valley areas. The remaining two zones – "Three" and "Four" – account for the remaining 10% of system connections and generally serve higher elevation areas around the City of Novato. A summary description of all four zones follows.

- Zone One serves users from 0 to 60 feet in elevation above sea level and includes the northern State Highway 101 corridor area in NMWD and presently represents 48% of the entire Novato distribution system's water connections. Water is conveyed into Zone One directly from Stafford and SCWA and triggered when operating storage levels within the five storage tanks fall below a designated operating level. The combined storage capacity in Zone One totals 13.8 million gallons or 42.5 acre-feet.
- Zone Two serves users from 60 to 200 feet in elevation above sea level and includes the southern State Highway 101 corridor area in NMWD and presently represents 43% of the entire Novato distribution system's water connections. Water is conveyed into Zone Two directly from six dedicated pump stations located in Zone One with a daily conveyance capacity of 5.9 million gallons or 18.4 acre-feet. Pressure in Zone Two is maintained by four primary storage tanks with a combined holding capacity of 16.5 million gallons or 50.6 acre-feet.²¹⁵
- Zone Three serves users from 200 to 400 feet in elevation above sea level and includes the unincorporated Atherton Avenue area and presently represents 8% of the entire Novato distribution system's water connections. Water is conveyed into Zone Three from 14 dedicated pump stations from Zones One and Two with a shared daily capacity of 2.6 million gallons or 8.2 acre-feet. Pressure within Zone Three is maintained by 14 storage tanks with a combined holding capacity of 3.3 million gallons or 10.0 acre-feet.²¹⁶
- Zone Four serves users 400 feet or more in elevation above sea level and includes the area in and around Buck Institute and Upper Wild Horse Valley Road and presently represents 1% of the entire Novato distribution system's water connections. There are four pump stations that convey water directly from Zone Three into Zone Four with a shared daily capacity of 0.3 million gallons or 1.0 acre-feet. Pressure in Zone Four is maintained by three storage tanks with a combined holding capacity of 0.5 million gallons or 1.7 acre-feet.

²¹⁵ An additional four tanks are available to Zone Two with a holding capacity of 2.3 million gallons or 7.1 acre-feet to serve isolated areas.

²¹⁶ There are also two small pump stations that convey water directly from Stafford into Zone Three with a combined daily capacity of 180,000 gallons or 0.6 acre-feet.

NMWD’s Treated Storage Tanks – Novato			
Table 4-123 (Marin LAFCO / NMWD)			
Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Zone One	48	North/Central Novato	13,850,000 gallons /42.5 acre-feet
Zone Two	43	South Novato	18,324,000 gallons /56.2 acre-feet
Zone Three	8	Atherton	3,268,000 gallons /10.0 acre-feet
Zone Four	1	Indian Valley	549,500 gallons /1.7 acre-feet
Total:			35,991,500 gallons / 110.4 acre-feet

Point Reyes Station System

NMWD’s distribution system for the Point Reyes Station system consists of approximately 24 miles of mains and overlays five connected pressure zones that generally serve distinct unincorporated communities and jointly cover a 1,000-foot range in elevation between service connections. The distribution system was initially built in phases beginning in the 1920s by the immediate predecessors to NMWD in West Marin – Point Reyes Water Company, et al – before its purchase and subsequent replacement beginning in the late 1960s and ranges in principle diameter size of four to eight inches. The distribution system relies on gravity pressure for recharge from 13 storage tanks that collectively hold 1.0 million gallons or 3.2 acre-feet; an amount equaling more than four times the current average day demand. There are also six pump stations connected to the distribution system conveying water from lower to higher pressure zones and triggered when operating storage levels within individual zones fall below a designated level.

NMWD’s potable storage capacity within the Point Reyes Station distribution system totals 3.2 acre-feet and can accommodate up to 2.2 days of average peak-day demand totals over the study period.

Close to two-thirds of all connections within the Point Reyes Station system are located within the “Point Reyes Station” Zone. The Point Reyes Station Zone serves as the initial entry point and gatekeeper for all water delivered from Lagunitas Creek by way of the Point Reyes Treatment Plant. The Point Reyes Station Zone is located at the lowest elevation range within the distribution system with pressure maintained by three storage tanks with a combined holding capacity of 0.580 million gallons or 1.8 acre-feet. Separate pump stations directly convey water from the Point Reyes Zone into the “Olema,” “Bear Valley,” and “Inverness Park” Zones as needed and based on designated storage levels within the individual zones. The fifth zone – “Paradise Ranch Estates” – receives pumped water from the Inverness Park Zone and includes several subzones and reliant on separate pump stations. A summary description of all five zones follows.

- The Point Reyes Station Zone covers approximately 2.11 square miles and presently represents 51% of the entire West Marin distribution system’s water connections. Water is conveyed into the Point Reyes Station Zone directly from the Point Reyes Station WTP by gravity and triggered when operating levels within the three storage tanks fall below a designated operating level. The combined

holding capacity of the three tanks within the Point Reyes Station Zone totals 0.580 million gallons or 1.8 acre-feet.

- The Olema Zone covers approximately 0.73 square miles and presently represents 5% of the entire West Marin distribution system’s water connections. Water is conveyed into the Olema Zone directly from a dedicated pump station in the Point Reyes Station Zone with a daily conveyance capacity of 0.270 million gallons or 0.8 acre-feet. Pressure is maintained in the Olema Zone by a single storage tank with a holding capacity of 0.150 million gallons or 0.5 acre-feet.
- The Inverness Park Zone covers approximately 2.32 square miles and presently represents 26% of the entire West Marin distribution system’s water connections. Water is conveyed into the Inverness Park Zone directly from a dedicated pump station located within the Point Reyes Station Zone with a daily conveyance capacity of 0.223 million gallons or 0.7 acre-feet. Pressure is maintained in the Inverness Park Zone by two storage tanks with a combined holding capacity of 0.136 million gallons or 0.4 acre-feet.²¹⁷
- The Paradise Ranch Zone covers approximately 1.07 square miles and presently represents 14% of the entire West Marin distribution system’s water connections. Water is conveyed into the Paradise Ranch Zone directly from a dedicated pump station located within the Inverness Park Zone with a daily conveyance capacity of 0.223 million gallons or 0.7 acre-feet. Pressure is maintained in the Paradise Ranch Zone by four storage tanks with a combined holding capacity of 0.138 million gallons or 0.4 acre-feet.
- The Bear Valley Zone covers approximately 1.23 square miles with connection percent included in the Inverness Park Zone. Water is conveyed into the Bear Valley Zone directly from a dedicated pump station located within the Point Reyes Station Zone with daily conveyance capacities of 0.100 million gallons or 0.3 acre-feet. Pressure is maintained in the Bear Valley Zone by three storage tanks with a combined holding capacity of 0.030 million gallons or 0.1 acre-feet.

NMWD’s Treated Storage Tanks – Point Reyes			
Table 4-124 (Marin LAFCO / NMWD)			
Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Point Reyes St.	51	Point Reyes Station	580,000 gallons /1.8 acre-feet
Olema	5	Olema	150,000 gallons /0.5 acre-feet
Inverness Park	26	Inverness Park	136,000 gallons /0.4 acre-feet
Bear Valley	- above -	Bear Valley	30,000 gallons /0.1 acre-feet
Paradise Ranch	14	Paradise Ranch	138,000 gallons /0.4 acre-feet
Total:			1,034,500 gallons / 3.2 acre-feet

²¹⁷ The Paradise Ranch Zone is further divided into four subzones.

* The remaining 4% of connections in the Point Reyes Station system lie outside NMWD’s five formal pressure zones and are dedicated to fire services or outside service users.

6.6 Service Connections

Novato System

NMWD serves 20,492 active water service connections within the Novato system as of term of the study period and divided between 19,058 (93%) residential and 1,434 commercial/business (7%). Connections have been relatively stagnant over the last five year period and have modestly increased in total by 76 or 0.4%. This increase is directly tied to new infill development within NMWD with a majority attributed to three specific projects: Warner Creek Senior Housing; Canyon Green Subdivision; and BioMarin. There are also 33 current water connections tied to the Novato system that lie outside the jurisdictional boundary and are documented in Section 3.4 of this agency profile.

Study Period Trends in NMWD’s Water Connections – Novato

Table 4-125 (NMWD)

Category	2009	2010	2011	2012	2013	5-Year Change
Residential	18,987	19,005	19,032	19,056	19,058	0.4%
Commercial	1,429	1,430	1,432	1,434	1,434	0.3%
	20,416	20,435	20,464	20,490	20,492	0.4%

Point Reyes Station System

NMWD serves 776 active water service connections within the Point Reyes Station system as of the term of the study period and divided between 698 (90%) residential and 78 commercial/business (10%). Connections have been relatively stagnant over the last five year period and have slightly increased in total by 17 or 0.2%. This increase is directly tied to new infill development within NMWD. There are also 12 current water connections tied to the Point Reyes Station system that lie outside NMWD’s jurisdictional boundary and are documented in Section 3.4 of this agency profile.

Study Period Trends in NMWD’s Water Connections – Point Reyes

Table 4-126 (NMWD)

Category	2009	2010	2011	2012	2013	5-Year Change
Residential	684	692	693	699	698	0.2%
Commercial	76	77	77	78	78	0.3%
	760	769	770	777	776	0.2%

6.7 System Demands

Novato System

NMWD’s average annual water production demand (metered and losses) over the **study period** within the Novato system has been 2.9 billion gallons or 9,149.8 acre-feet (see footnote 37).²¹⁸ The most recent completed year showed total demand at 3.2 billion gallons or 9,796.4 acre-feet. This most recent amount represents an average daily water demand for the entire Novato system of 8.7 million gallons or 26.8 acre-feet; an amount that is further broken down to 426 gallons per day for every active service connection. Per capita use has similarly increased relative to per connections with a study period average of 130 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 45.4 acre-feet and was over two-thirds greater than annualized daily average and results in a peaking factor of 1.69.²¹⁹

The average annual water production demand in the Novato system over the study period has been 9,150 acre-feet and translates to 399 gallons per day for every active connection. The average daily water demand per resident has been 130 gallons. Overall water demands have increased by 3.8%; an amount that is 10 times greater than the estimated population change in the system over the same period.

With respect to trends, the Novato system has experienced an overall increase of 3.8% in water demand production over the last five year period or 0.8% annually. This overall increase in water demands outpaces the projected change in population in the Novato system over the same time period – 0.08% annually – by ten-fold. This increase in usage appears substantively attributed to weather and economic variations as well as the intensification of uses given the lack of significant new development within the system. Nonetheless, changes in peak-day demands have decreased over the last five year period from 53.3 to 45.4 acre-feet or (14.8%). The following table summarizes overall system demands over the last five years.

Study Period Trends in NMWD’s Water Demands – Novato							
Table 4-127 (Marin LAFCO / NMWD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	9,373.2	8,492.1	8,890.4	9,197.1	9,796.4	9,149.8	3.8%
Average Day	25.7	23.3	24.4	25.2	26.8	25.1	3.8%
Connections	20,416	20,435	20,464	20,490	20,492	20,459	0.4%
Per Day Connection	410g	372g	389g	401g	426g	399 gallons	3.9%
Per Day Resident	134g	121g	127g	131g	139g	130 gallons	3.7%
Peak Day	53.3	41.1	43.4	47.3	45.4	46.1	(14.8%)
Peaking Factor	2.07p	1.76p	1.79p	1.88p	1.69p	1.84 peaking	(18.4%)

Year Amounts Shown in Acre Feet Unless Stated Otherwise

²¹⁸ Demand includes overall production and incorporates both sales and non-sales (line flushing, system losses, etc.).
²¹⁹ The peaking factor varied over the five year period from a low of 41.14 to a high of 53.32.

Going forward – and specifically for purposes of this study – it appears reasonable to assume NMWD’s water demands within the Novato system will generally follow trends exhibited over the study period. It is estimated, accordingly and using linear regression to control for large variances in the most recent year-end totals, the Novato system will experience an overall increase in water demand of 440.1 acre-feet over the next 10 years to 2023; a difference of 4.5% or 0.05% annually and a deceleration of more than one-third relative to rises in the last five-year period. It is also estimated the Novato system’s peak-day demands will trend consistent with recent amounts and the current five year average peaking factor of 1.8 – which incorporates recent variances as is – will hold through 2023.

LAFCO projects NMWD’s annual water demands for the Novato system will increase by 440 acre-feet or 4.5% by 2023; a deceleration in use of more than one-third compared to the study period. The anticipated daily usage is expected to similarly rise to 442 gallons per connection by 2023.

The following table summarizes Commission projections over the next 10 years.

LAFCO Projected Trends in NMWD’s Water Demands – Novato							
Table 4-128 (Marin LAFCO)							
Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	9,976.4	9,528.9	9,701.2	9,879.6	10,058.1	10,236.5	4.5%
Average Day	26.8	26.1	26.6	27.1	27.6	28.0	4.5%
Peak Day	45.4	48.0	48.9	49.9	50.8	51.5	7.3%
Connections	20,492	20,521	20,549	20,578	20,607	20,636	15.3%
Per Day Connection	426g	415g	421g	429g	436g	442g	3.8%
Per Day Resident	139g	135g	137g	140g	142g	144g	3.6%

*Year Amounts Shown in Acre Feet Unless Provided Otherwise
 “g” refers to gallons*

Notes to LAFCO Projected Trends in Water Demands – Novato System:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2009 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 1.84 ratio over average day demands based on 2009 to 2013 data.

Point Reyes Station System

NMWD’s average annual water production demand (metered and losses) over the **study period** within the Point Reyes Station system has been 83.6 million gallons or 256.6 acre-feet (see footnote 37).²²⁰ The most recent completed year showed total demand at 82.6 million gallons or 253.7 acre-feet. This most recent amount represents an average daily water demand for the entire Point Reyes Station system of 0.226 million gallons or 0.7 acre-feet; an amount that is further broken down to 291 gallons per day for every active service connection. Per capita use has similarly decreased relative to per connections with a study period average of 118 gallons. The peak-day demand – the highest day sum – totaled 1.3 acre-feet and was nearly double the annualized daily average and results in a peaking factor of 1.9.

The average annual water production demand in the Point Reyes Station system over study period has been 257 acre-feet and translates to 297 gallons per day for every active connection. The average daily water demand per resident has been 118 gallons. Overall water demands during this period have decreased by (15.7%). This change, however, is adjusted to an overall increase in demands of 4.6% if eliminating the high-use outlier of 2009 in which usage totaled 301 acre-feet.

With respect to trends, the Point Reyes Station system has experienced an overall decrease of (15.7%) in water demands over the study period or (3.2%) annually. This overall decrease in water demands is substantially less than the projected change in population in the Point Reyes Station system over the same time period – 0.4% annually – by over eight-fold. This large decrease in usage is tied to the closure of a prominent dairy operation at the beginning of the review endpoints and reflected with uses declining by 20% from 301.1 acre-feet in 2009 to 242.5 acre-feet in 2010. This referenced outlier is further substantiated by noting overall uses in the Point Reyes Station system between 2010 and 2013 increased by 4.6% or 1.2% annually. Peak-day demands, however, have remained relatively consistent over the entire five-year period relative to overall usage and averaged a 2.1 ratio over average day usage. The following table summarizes these system demands.

Study Period Trends in NMWD’s Water Demands – Point Reyes							
Table 4-129 (Marin LAFCO / NMWD)							
Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	301.1	242.5	243.6	242.2	253.7	256.6	(15.7%)
Average Day	0.82	0.66	0.67	0.66	0.70	0.70	(14.6%)
Connections	760	769	770	777	776	770	0.2%
Per Day Connection	352g	280g	284g	277g	294g	294 gallons	(16.5%)
Per Day Resident	140g	111g	113g	110g	117g	118 gallons	(16.4%)
Peak Day	1.46	1.34	1.97	1.24	1.23	1.45	(15.8%)
Peaking Factor	1.8p	2.0p	1.8p	1.9p	1.8p	2.1 peaking	1.6%

*Year Amounts Shown in Acre Feet Unless Provided Otherwise
“g” refers to gallons*

²²⁰ Demand includes overall production and incorporates both sales and non-sales (line flushing, system losses, etc.).

Going forward – and specifically for purposes of this study – it appears reasonable to assume NMWD’s water demands within the Point Reyes Station system will generally follow trends exhibited over the last four years; as referenced above usage in 2009 appears to be an outlier and is therefore omitted from the calculations going forward. It is estimated, accordingly and using linear regression to control for variances in the most recent year-end totals, the Point Reyes Station system will experience an overall decrease in water demand of (4.7) acre-feet over the next 10 years to 2023; a difference of (1.9%) or 0.19% annually. It is also estimated the Point Reyes Station system’s peak-day demands will remain flat and trend consistent with recent amounts and the current five year average peaking factor of 2.1 – which incorporates recent variances as is – will hold through 2023. The following table summarizes these Commission projections over the next 10 years for the Point Reyes Station system.

LAFCO projects NMWD’s annual water demands for the Point Reyes Station system will decrease by (5) acre-feet or (2%) by 2023; a percentage change of more than double over study period and will result in daily usage declining to 284 gallons per connection by 2023.

LAFCO Projected Trends in NMWD’s Water Demands – Point Reyes							
Table 4-130 (Marin LAFCO)							
Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	253.7	247.3	247.8	248.4	248.4	249.0	(1.9%)
Average Day	0.70	0.68	0.68	0.68	0.68	0.68	(2.9%)
Peak Day	1.23	1.43	1.43	1.43	1.43	1.43	16.20%
Connections	776	777	777	778	778	779	(0.4%)
Per Day Connection	294g	285g	285g	285g	285g	284g	(3.4%)
Per Day Resident	117g	113g	112g	111g	110g	109g	(6.8%)

*Year Amounts Shown in Acre Feet Unless Provided Otherwise
“g” refers to gallons*

Notes to LAFCO Projected Trends in Water Demands – Point Reyes Station system:

- 1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2010 and 2013. Actual calculations will be provided as appendices to final report.
- 2) Peak day demands assume a flat 2.1 ratio over average day demands.

6.8 Infrastructure Capacities to Demands

NMWD’s two potable water systems are generally operating with available capacities in supply, storage, and treatment as it relates to accommodating existing demands in the Novato and Point Reyes Station areas based on study period averages. These capacities are also generally expected to sufficiently accommodate anticipated demands over the next 10 years with limited – but nonetheless substantive – exceptions for each system. This includes noting annual water supplies for the Novato system under projected single-dry year drought conditions are nearing capacity and projected into a deficit going forward towards 2023. Peak-day demands within the Novato system under projected single-dry year drought conditions also show a current deficit 0.5 million gallons and on pace to increase five-fold to 2.5 million gallons by 2023 and underlies NMWD’s

dependency on stored reserves during high-use periods. Infrastructure constraints in the Point Reyes Station area are less prominent but do include dedicated storage within the Paradise Ranch Estates nearing capacity relative to the area’s calculated peak-day demand and likely to reach its operating threshold going forward and by 2023.

The following statements summarize and quantify existing and projected relationships between NMWD’s capacities and demands within both of the District’s system now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California’s Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Novato System

Water Supply:

Annual Ratios

- Average annual water production demands generated over the study period represent 41% of NMWD’s projected accessible sources for the Novato system under normal conditions. This ratio is expected to rise to 45% by 2023.
- Average annual water production demands generated over the study period represent 87% of NMWD’s projected accessible sources for the Novato system under projected single dry-year conditions. This ratio is expected to rise by to near capacity at 97% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 53% of the new daily supply available to NMWD and the Novato system under normal conditions. This ratio is expected to rise to 59% by 2023.
- Average peak-day water production demands over the study period represent 105% of the new daily supply available to NMWD and the Novato system under projected single dry-year conditions – or a deficit of (5%). This ratio is expected to rise to a deficit of (17%) by 2023.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 57% of NMWD’s existing potable treatment capacities collectively available by Stafford and SCWA. This ratio is expected to rise to 64% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 42% of NMWD’s existing overall potable storage capacity specific to the Novato system. This ratio is expected to rise to 47% by 2023.
- All four pressure zones within the Novato system have adequate dedicated potable storage in meeting their proportional share of NMWD’s average peak day water production demands. No substantive change in these ratios is projected going forward through 2023.
- Overall potable storage capacity in the Novato system allows NMWD to accommodate 2.4 consecutive days of average peak-day production demands without recharge. This capacity is projected to decrease to 2.1 days by 2023.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 within NMWD’s Novato system is provided below.

NMWD’s Capacity Relative to <u>Current</u> Average Demands in Novato			
Table 4-131 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply	✓		
...normal conditions			
...single dry-year conditions			✓
Water Treatment	✓		
Water Storage	✓		

NMWD’s Capacity Relative to <u>Projected</u> Demands by 2023 in Novato			
Table 4-132 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply	✓		
...normal conditions			
...single dry-year conditions			✓
Water Treatment	✓		
Water Storage	✓		

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

Point Reyes Station System

Water Supply:

Annual
Ratios

- Average annual water production demands generated over the study period represent 39% of NMWD's projected accessible sources for the Point Reyes Station system under normal conditions. This ratio is expected to decrease to 38% by 2023.
- Average annual water production demands generated over the study period represent 45% of NMWD's projected accessible sources for the Point Reyes Station system under projected single dry-year conditions. This ratio is expected to decrease to 44% by 2023.

Peak-Day
Ratios

- Average peak-day water production demands generated over the study period represent 78% of the new daily supply available to NMWD and the Point Reyes Station system under normal conditions. This ratio is expected to decrease to 77% by 2023. No changes are projected under single-dry year conditions given NMWD's drought-year agreement with MMWD for extra flows from Kent Lake.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 68% of NMWD's existing potable treatment capacity within the Point Reyes Station system. This ratio is expected to decrease to 67% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 45% of NMWD's existing overall potable storage capacity in the Point Reyes Station system. This ratio is expected to hold through 2023.
- All five pressure zones within the Point Reyes Station system have adequate dedicated potable storage in meeting their proportional share of NMWD's current-peak day demands. No substantive change in these ratios is projected going forward with the exception of anticipated peak-day uses in Zone Three (Paradise Ranch Estates) likely nearing its dedicated storage capacity by 2023.
- NMWD's overall potable storage capacity in the Point Reyes Station system can accommodate up to 2.2 consecutive days of average peak-day demands without recharge. This ratio is projected to hold through 2023.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 within the Point Reyes Station system is provided below.

NMWD's Capacity Relative to <u>Current</u> Average Demands in Point Reyes			
Table 4-133 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions	✓		
Water Treatment	✓		
Water Storage	✓		

NMWD's Capacity Relative to <u>Projected</u> Demands by 2023 in Point Reyes			
Table 4-134 (Marin LAFCO)			
Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions	✓		
Water Treatment	✓		
Water Storage		✓	

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

Novato System

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Novato system in terms of covering both improvements and operations: (a) service and (b) quantity.²²¹ The service charge is set by Board regulations and is intended to contribute towards fixed costs. The service charge for the Novato system was last updated by the Board in June 2013 and presently assigns a bi-monthly charge of \$30 for most users.²²² The quantity charge was last updated in June 2014 and is in tier format to apply an escalating rate based on consumption to cover day-to-day operating costs. The quantity charge applies evenly to inside and outside customers and currently results in the average residential customer paying \$134.13 for every two-month billing cycle. This amount is based on the average day usage of 399 gallons and incorporates both the flat service

The current average residential customer in NMWD's Novato system is paying \$805 annually in direct water charges based on a daily use of 399 gallons. This produces an approximate ratio of \$0.55 for every 100 gallons.

²²¹ Additional bi-monthly charges are applied to the quantity charge for connections located in upper pressure zones.
²²² The \$30 bi-monthly service charge is based on connections no larger than ¾ inches.

charge (\$30.00) and variable charge (\$134.13). The cumulative cost for most NMWD customers in the Novato system is \$805 annually and results in a per 100 gallon equivalent charge of \$0.55 based on rates as of January 2015.

NMWD also collects a connection fee for new customers to the Novato system. The fee for a typical single-family residential structure is presently set at \$32,580.

Point Reyes Station System

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Point Reyes Station system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge is set by Board regulation and is intended to contribute towards fixed costs. The service charge for the Point Reyes Station system was last updated by the Board in July 2013 and presently assigns a bi-monthly charge of \$30 for most users.²²³

The current average residential customer in NMWD's Point Reyes system is paying \$947 annually in direct water charges based on a daily use of 294 gallons. This produces an approximate ratio of \$0.88 for every 100 gallons.

The quantity charge was also last updated in July 2014 and is in tier format to apply an escalating rate based on consumption to cover day-to-day operating costs. The quantity results in the average residential customer paying \$157.88 for every two-month billing cycle. This amount is based on the average day usage of 294 gallons and incorporates both the flat service charge (\$30.00) and variable charge (\$127.88). The cumulative costs for most NMWD customers is \$947.28 annually and results in a per 100 gallon equivalent charge of \$0.88 based on rates as of January 2015.

NMWD also collects a connection fee for new customers to the Point Reyes Station system. The fee for a typical single-family residence is presently set at \$28,310.

7.0 Agency Finances

7.1 Financial Statements

NMWD prepares financial statements for each fiscal year utilizing the services of a certified public accounting firm. The financial statements are done at the end of the fiscal year on an accrual accounting basis and identify NMWD's total assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing NMWD's short and long-term fiscal health.

²²³ The \$30 bi-monthly service charge is based on connections no larger than ¾ inches. Residential connections located in Paradise Ranch are charged a \$46 bi-monthly service charge..

NMWD’s most recent financial statements during the study period were issued for 2012-2013 and shows the District experienced a substantive and positive change to its fiscal standing over the preceding 12 months as its overall equity or fund balance increased by just over 6% from \$76.061 to \$81.097 million. This increase in the overall fund balance appears directly tied to an operating surplus that was facilitated by the implementation of a rate increase to service and quantity charges coupled with higher usage. A summary of year-end totals and corresponding trends over the study period follows.

NMWD / 2012-2013 Financial Statements	
Assets	\$121.141m
Liabilities	\$40.044 m
Equity	\$81.097 m

Agency Assets

NMWD’s audited and overall assets at the end of 2012-2013 totaled \$121.141 million and have increased over the preceding five year period. Assets classified as current with the expectation they could be liquidated within a year represented close to one-eighth of the total amount with the majority tied to capital grants, loans, cash and cash equivalents. Assets classified as non-current represented the remaining seven-eighths, with the largest portion associated various capital assets with the single largest valued item being the water distribution systems booked at \$68.1 million.

NMWD Assets Study Period						
Table 4-135 (Marin LAFCO / NMWD)						
NMWD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Current Assets	9.438	6.873	6.311	18.315	16.390	73.6
Non-Current Assets	88.184	88.163	86.037	96.343	104.751	18.8
	\$97.623	\$95.037	\$95.348	\$114.659	\$121.141	24.1%

amounts in millions

Agency Liabilities

NMWD’s audited and overall liabilities at the end of 2012-2013 totaled \$40.044 million and have increased by nearly two-thirds over the preceding five year period. Current liabilities representing obligations owed within a year accounted for the nearly 10% of total amount, and primarily tied to accounts payable and loan repayments. NMWD’s non-current liabilities make up the other 90% and are primarily tied to long term loan repayment and highlighted by an outstanding \$13.4 million loan balance from the Department of Water Resources dating back to 2005 and tied to the reconstruction of the Stafford WTP.

NMWD Liabilities Study Period						
Table 4-136 (Marin LAFCO / NMWD)						
NMWD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Current Liabilities	3.450	2.244	2.355	4.746	3.771	9.3
Non-Current Liabilities	20.889	20.128	19.699	33.851	36.273	73.6
	\$24.340	\$22.372	\$22.054	\$38.597	\$40.044	64.5%

amounts in millions

Agency Equity / Net Assets

NMWD’s audited equity / net assets at the end of 2012-2013 totaled \$81.097 million and represent the difference between the District’s total assets and total liabilities. This amount has increased by just over ten percent over the five previous fiscal years. The end of year equity amount incorporates a \$13.071 million or 16.1% in unrestricted funds that has increased by nearly two-thirds over the preceding five year period and attributed to increased water rates beginning in 2011-2012.

NMWD’s unrestricted fund balance total of \$13.0million equates to a per capita reserve amount of \$202 as of the term of the study period.

NMWD Equity						
Table 4-137 (Marin LAFCO / NMWD)						
NMWD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Unrestricted	7.921	6.462	6.579	11.185	13.071	65.0
Restricted	4.304	5.332	3.171	2.993	2.186	(49.2)
Capital	61.057	60.880	63.542	61.882	65.839	7.8
	\$73.283	\$72.674	\$75.293	\$76.061	\$81.097	10.7%

amounts in millions

7.2 Liquidity, Capital, and Profitability

A review of the financial statement issuances by NMWD covering the study period shows the District generally improved its economic standing, highlighted by improved liquidity and profitability. This includes NMWD expanding the value of near-term assets over near-term liabilities by almost 60% and finishing the review period with sufficient resources to cover immediate debts – like payroll and interest payments – by a ratio of over four-to-one. NMWD also incrementally eliminated a persistent operating deficit by the end of the five year period with the aid of the District enacting three consecutive 11% annual increases to user rates beginning in 2011. NMWD did experience, nonetheless, a significant decrease in capital as a result of new long-term debt obligations and marked by finishing with a relatively high debt-to-equity ratio of 45%. A summary of year-end liquidity, capital, and operating margin ratios as of July 1, 2013 are show in the following table.

Study Period Trends in NMWD Liquidity, Capital, and Margin			
Table 4-138 (Marin LAFCO)			
Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	2.735 to 1	0.285	(82.00)
2009-2010	3.063 to 1	0.277	(28.17)
2010-2011	2.679 to 1	0.269	(8.19)
2011-2012	3.859 to 1	0.445	(2.71)
2012-2013	4.346 to 1	0.447	10.95
Averages	3.336 to 1	0.349	(22.0%)
5-Year Trend	58.9%	56.9%	n/a

7.3 Pension Obligations

NMWD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. NMWD maintains two contract packages – termed “Tier One” and “Tier Two” – for employee pensions based on the date of hire. Tier One is based on a 2.5% at 55 formula and would provide an eligible retiree with 20 years of total service credit 50% of their highest year salary beginning at age 55 and continuing each year thereafter until death. Tier Two is based on a 2.0% at 62 formula and would provide an eligible retiree with 20 years of total service credit 40% of their highest three years of salary beginning at age 62 and continuing each year thereafter until death.

NMWD’s Defined Pension Benefit Tiers	
Table 4-139 (CalPERS)	
Category	Miscellaneous
Tier One (Pre January 2013).....	2.5% at 55
Tier Two (Post January 2013).....	2.0% at 62

Note:

All tiers provide up to a 2.0% annual cost-of-living adjustment

Funding contributions for NMWD are based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arraignments between the District and its employees. A listing of recent and planned minimum contribution rates for NMWD as determined by CalPERS along with enrollee information follows.

NMWD’s Minimum Contribution Rates to CalPERS					
Table 4-140 (Marin LAFCO / CalPERS)					
11-12	12-13	13-14	14-15	15-16	Change
18.15	19.95%	20.04%	15.70%	19.20%	5.79%

Projected

NMWD’s Pension Enrollee Information	
Table 4-141 (CalPERS)	
Enrollee Type	As of June 30, 2013
Active.....	50
Transferred.....	7
Separated.....	13
Retired.....	59

NMWD’s total annual pension contributions are on the rise in step with increasing liability based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. NMWD has increased its total annual pension contributions by 17% from \$0.913 million to \$1.068 million over the span of the three affected fiscal years and exceeds the corresponding inflation factor for the San Francisco Bay area region during this period

NMWD’s unfunded pension liability has increased over the last three reported years and currently totals \$10.249 million; an amount that that equals 78.4% of the District’s unrestricted fund balance as of the start of 2013-2014.

of 5.0% by over three-fold. This increase in contributions is helping, albeit modestly and proportionally less than the rise in contributions, to improve NMWD’s funded status – the difference between the pension plan’s assets and liabilities – during this window with the current ratio at 71.7% (market) and 80.1% (actuarial). NMWD’s unfunded liability – pension monies owed that are not covered by assets – nonetheless has continued to increase and highlighted by the market value rising 7.4% over the three year period to \$10.249 million; an amount that equals 78.4% of the District’s current unrestricted fund balance as of the start of 2013-2014.²²⁴ NMWD’s worker-to-retiree ratio has also decreased by nearly one-fifth over the three-year period from 1.0 to 0.84; all of which means it is reasonable to assume employer and employee contributions will need to increase to simply maintain existing debt levels.

NMWD Trends in Pension Measurements				
Table 4-142 (Marin LAFCO / NMWD)				
Category	2010-2011	2011-2012	2012-2013	Difference
NMWD Annual Contribution	\$0.913 million	\$1.031 million	\$1.068 million	17.0%
Funded Ratio – Market	71.3%	67.3%	71.7%	0.6%
Unfunded Liability - Market	\$9.566 million	\$11.304 million	\$10.249 million	7.4%
Funded Ratio – Actuarial	79.6%	80.1%	n/a	-
Unfunded Liability -Actuarial	\$6.782 million	\$6.893 million	n/a	-
Active to Retiree Ratio - active employees for every retiree	1.0	0.96	0.84	(16.0%)

Notes:

- 1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now).
- 2) Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.) CalPERS no longer calculates AVA measurements as of the 2012-2013 fiscal year.

²²⁴ NMWD’s undesignated fund balance (audited) as of June 30, 2013 totaled \$13.071 million.

7.4 Revenue and Expense Trends

NMWD has experienced revenue deficits in four of the five fiscal years covering the study period with an overall five-year average annual shortfall of (\$2.796) million or (19%). Annual revenues over this period have averaged \$14.942 million with nearly 94% of this amount drawn from water sales. Annual expenses over the same period, conversely, have averaged \$17.739 million and were led by purchasing water from SCWA (24.6%) and depreciation of capital assets (27%). The relationship between NMWD’s revenues and expenses, however, is improving and highlighted by a surplus in the final year of the review period. This positive trend is further highlighted by overall revenues increasing by 41% while expenses have decreased by (31%).

NMWD has experienced revenue deficits in four of the five years covering the study period. This trend, however, is improving with revenues increasing by 41% while year-end expenses have decreased by (31%) over the study period.

A summary of the five-year averages within both revenue and expense ledgers follows.

Study Period Trends in NMWD Revenues

Table 4-143 (Marin LAFCO / NMWD)

Category	Five Year \$ Average (2008-09 to 2012-13)	% of Total	Five Year % Change (2008-09 to 2012-13)
Property Taxes	0.098	0.7	(15.0)
Water Charges	14.046	93.9	45.0
Sewer Charges	0.152	1.0	6.8
Other Service Charges	0.343	2.3	100.6
Investments/Interest	0.187	1.4	(80.5)
Other	0.115	0.8	19.4
	\$14.942	100%	41.1%

Study Period Trends in NMWD Expenses

Table 4-144 (Marin LAFCO / NMWD)

Category	Five Year \$ Average (2008-09 to 2012-13)	% of Total	Five Year % Change (2008-09 to 2012-13)
SCWA Water Purchases	4.361	24.6	34.9
Water Pumping	0.318	1.8	3.7
Water Operations	0.657	3.7	23.8
Water Treatment	1.910	10.8	11.5
Water Distribution	2.379	13.4	0.2
Sewer Collection/Treatment	0.107	0.6	29.6
General Administration	2.183	12.3	(18.2)
Projects/Conservation	1.024	5.8	(87.0)
Other/Depreciation	4.794	27.0	(66.9)
	\$17.739	100%	(31.0%)